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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

FORM 10-K

☑ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the fiscal year ended December 31, 2021

OR

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from to
Commission file number 001-38730

LINDE PLC

(Exact name of registrant as specified in its charter)

Ireland	**98-1448883**
(State or other jurisdiction of incorporation)	(I.R.S. Employer Identification No.)
10 Riverview Drive, Danbury, Connecticut United States 06810	The Priestley Centre 10 Priestly Road Surrey Research Park Guilford, Surrey GU2 7XY United Kingdom

(Address of principal executive offices) (Zip Code)

(203) 837 - 2000	+ 44 14 83 242200

(Registrant's telephone number, including area code)

Securities registered pursuant to Section 12(b) of the Act:

Title of each class:	Trading Symbol(s)
Ordinary shares (€0.001 nominal value per share)	**LIN**

Securities registered pursuant to Section 12(g) of the Act: None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☑ No ☐

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes ☐ No ☑

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☑ No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☑ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," " smaller reporting company, " and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer ☑ Accelerated filer ☐ Non- accelerated filer ☐ Smaller reporting company ☐ Emerging growth company ☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. Yes ☑ No ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act). Yes ☐ No ☑

The aggregate market value of the voting and non-voting common stock held by non-affiliates as of June 30, 2021, was approximately $149 billion (based on the closing sale price of the stock on that date as reported on the New York Stock Exchange).

At January 31, 2022, 507,744,577 ordinary shares of €0.001 nominal value per share of the Registrant were outstanding.

Documents incorporated by reference:

Portions of the Proxy Statement of Linde plc for its 2022 Annual General Meeting of Shareholders, are incorporated in Part III of this report.

LINDE PLC

ANNUAL REPORT ON FORM 10-K
For the fiscal year ended December 31, 2021

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FORWARD-LOOKING STATEMENTS

This document contains “forward-looking statements” within the meaning of the Private Securities Litigation Reform Act of 1995. These forward-looking statements are identified by terms and phrases such as: anticipate, believe, intend, estimate, expect, continue, should, could, may, plan, project, predict, will, potential, forecast, and similar expressions. They are based on management’s reasonable expectations and assumptions as of the date the statements are made but involve risks and uncertainties. These risks and uncertainties include, without limitation: the performance of stock markets generally; developments in worldwide and national economies and other international events and circumstances, including trade conflicts and tariffs; changes in foreign currencies and in interest rates; the cost and availability of electric power, natural gas and other raw materials; the ability to achieve price increases to offset cost increases; catastrophic events including natural disasters, epidemics, pandemics such as COVID-19, and acts of war and terrorism; the ability to attract, hire, and retain qualified personnel; the impact of changes in financial accounting standards; the impact of changes in pension plan liabilities; the impact of tax, environmental, healthcare and other legislation and government regulation in jurisdictions in which the company operates; the cost and outcomes of investigations, litigation and regulatory proceedings; the impact of potential unusual or non-recurring items; continued timely development and market acceptance of new products and applications; the impact of competitive products and pricing; future financial and operating performance of major customers and industries served; the impact of information technology system failures, network disruptions and breaches in data security; and the effectiveness and speed of integrating new acquisitions into the business. These risks and uncertainties may cause actual future results or circumstances to differ materially from accounting principles generally accepted in the United States of America, International Financial Reporting Standards or adjusted projections, estimates or other forward-looking statements.

Linde plc assumes no obligation to update or provide revisions to any forward-looking statement in response to changing circumstances. The above listed risks and uncertainties are further described in Item 1A (Risk Factors) in this report, which should be reviewed carefully. Please consider Linde plc’s forward-looking statements in light of those risks.

Linde plc and Subsidiaries

PART I

ITEM 1. BUSINESS

General

Linde plc is a public limited company formed under the laws of Ireland with its principal offices in the United Kingdom and United States. Linde is the largest industrial gas company worldwide and is a major technological innovator in the industrial gases industry. Its primary products in its industrial gases business are atmospheric gases (oxygen, nitrogen, argon, and rare gases) and process gases (carbon dioxide, helium, hydrogen, electronic gases, specialty gases, and acetylene). The company also designs and builds equipment that produces industrial gases and offers customers a wide range of gas production and processing services such as olefin plants, natural gas plants, air separation plants, hydrogen and synthesis gas plants and other types of plants.

Linde serves a diverse group of industries including healthcare, chemicals and energy, manufacturing, metals and mining, food and beverage, and electronics.

Linde's sales were $30,793 million, $27,243 million, and $28,228 million for 2021, 2020, and 2019, respectively. Refer to Item 7, Management's Discussion and Analysis, for a discussion of consolidated sales and Note 18 to the consolidated financial statements for additional information related to Linde's reportable segments.

Industrial Gases Products and Manufacturing Processes

Atmospheric gases are the highest volume products produced by Linde. Using air as its raw material, Linde produces oxygen, nitrogen and argon through several air separation processes of which cryogenic air separation is the most prevalent. Rare gases, such as krypton, neon and xenon, are also produced through cryogenic air separation. As a pioneer in the industrial gases industry, Linde is a leader in developing a wide range of proprietary and patented applications and supply systems technology. Linde also led the development and commercialization of non-cryogenic air separation technologies for the production of industrial gases. These technologies open important new markets and optimize production capacity for the company by lowering the cost of supplying industrial gases. These technologies include proprietary vacuum pressure swing adsorption ("VPSA") and membrane separation to produce gaseous oxygen and nitrogen, respectively.

Process gases, including carbon dioxide, hydrogen, carbon monoxide, helium, specialty gases and acetylene are produced by methods other than air separation. Most carbon dioxide is purchased from by-product sources, including chemical plants, refineries and industrial processes or is recovered from carbon dioxide wells. Carbon dioxide is processed in Linde's plants to produce commercial and food-grade carbon dioxide.

Hydrogen is produced from a range of feedstocks using an array of different technologies. Despite hydrogen being an invisible molecule, colors are often used to designate and differentiate between the production processes used to produce the molecule. The vast majority of hydrogen currently produced by Linde is what is termed gray hydrogen and is derived from natural gas or methane, using steam methane reformation technology. Linde has multiple technologies to produce other types of hydrogen, including blue and green, which are both considered types of clean energy. Blue hydrogen is produced by capturing the carbon emissions from the hydrogen plant and either utilizing them in a way that stops them from being emitted or sequestering them in the subsurface for the long term. Green hydrogen is produced by electrolysis using renewable energy or from the steam methane reforming of biomethane. Low carbon intensity, high-purity hydrogen is also produced by purifying and recovering by-product hydrogen sources from the chemical and petrochemical industries.

Helium is sourced from certain helium-rich natural gas streams in the United States, with additional supplies being acquired from outside the United States. Carbon monoxide can be produced by either steam methane reforming or auto-thermal reforming of natural gas or other feed streams such as naphtha. Acetylene is primarily sourced as a chemical by-product, but may also be produced from calcium carbide and water.

Industrial Gases Distribution

There are three basic distribution methods for industrial gases: (i) on-site or tonnage; (ii) merchant or bulk liquid; and (iii) packaged or cylinder gases. These distribution methods are often integrated, with products from all three supply modes coming from the same plant. The method of supply is generally determined by the lowest cost means of meeting the customer's needs, depending upon factors such as volume requirements, purity, pattern of usage, and the form in which the product is used (as a gas or as a cryogenic liquid).

On-site. Customers that require the largest volumes of product (typically oxygen, nitrogen and hydrogen) and that have a relatively constant demand pattern are supplied by cryogenic and process gas on-site plants. Linde constructs plants on or adjacent to these customers' sites and supplies the product directly to customers by pipeline. On-site product supply contracts generally are total requirement contracts with terms typically ranging from 10-20 years and containing minimum purchase requirements and price escalation provisions. Many of the cryogenic on-site plants also produce liquid products for the merchant market. Therefore, plants are typically not dedicated to a single customer. Advanced air separation processes allow on-site delivery to customers with smaller volume requirements.

Merchant. The merchant business is generally associated with distributable liquid oxygen, nitrogen, argon, carbon dioxide, hydrogen and helium. The deliveries generally are made from Linde's plants by tanker trucks to storage containers at the customer's site which are owned and maintained by Linde and leased to the customer. Due to distribution cost, merchant oxygen and nitrogen generally have a relatively small distribution radius from the plants at which they are produced. Merchant argon, hydrogen and helium can be shipped much longer distances. The customer agreements used in the merchant business are usually three to seven-year requirement contracts.

Packaged Gases. Customers requiring small volumes are supplied products in metal containers called cylinders, under medium to high pressure. Packaged gases include atmospheric gases, carbon dioxide, hydrogen, helium, acetylene and related products. Linde also produces and distributes in cylinders a wide range of specialty gases and mixtures. Cylinders may be delivered to the customer's site or picked up by the customer at a packaging facility or retail store. Packaged gases are generally sold under one to three-year supply contracts and through purchase orders.

Engineering

Linde's Engineering business has a global presence, with its focus on market segments such as olefin, natural gas, air separation, hydrogen and synthesis gas plants. The company utilizes its extensive process engineering know-how in the planning, design and construction of highly efficient turnkey plants for the production and processing of gases. With its state-of-the-art sustainable technologies Engineering helps customers avoid, capture and utilize CO2 emissions. Its technology portfolio covers the entire value chain for production, liquefaction, storage, distribution and application of hydrogen which supports the transition to clean energy. Its digital services and solutions increase plant efficiency and performance.

Linde's plants are used in a wide variety of fields: in the petrochemical and chemical industries, in refineries and fertilizer plants, to recover air gases, to produce synthesis gases, to treat natural gas and to produce noble gases. The Engineering business either supplies plant components directly to the customer or to the industrial gas business of Linde which operates the plants under a long-term gases supply contract.

Inventories – Linde carries inventories of merchant and cylinder gases and hardgoods to supply products to its customers on a reasonable delivery schedule. On-site plants and pipeline complexes have limited inventory. Inventory obsolescence is not material to Linde's business.

Customers – Linde is not dependent upon a single customer or a few customers.

International – Linde is a global enterprise with approximately 70% of its 2021 sales outside of the United States. The company also has majority or wholly owned subsidiaries that operate in approximately 45 European, Middle Eastern and African countries (including Germany, France, Sweden, the Republic of South Africa, and the United Kingdom (U.K.)); approximately 20 Asian and South Pacific countries (including China, Australia, India, South Korea and Thailand); and approximately 20 countries in North and South America (including Canada, Mexico and Brazil).

The company also has equity method investments operating in Europe, Asia, Africa, the Middle East, and North America.

Linde's non-U.S. business is subject to risks customarily encountered in non-U.S. operations, including fluctuations in foreign currency exchange rates, import and export controls, and other economic, political and regulatory policies of local governments. Also, see Item 1A. "Risk Factors" and Item 7A. "Quantitative and Qualitative Disclosures About Market Risk."

Seasonality – Linde's business is generally not subject to seasonal fluctuations to any significant extent.

Research and Development – Linde's research and development is directed toward development of gas processing, separation and liquefaction technologies, and clean energy technologies; improving distribution of industrial gases and the development of new markets and applications for these gases. This results in the development of new advanced air separation, hydrogen, synthesis gas, natural gas, adsorption and chemical process technologies; novel clean energy and carbon management solutions; as well as the frequent introduction of new industrial gas applications. Research and development is primarily conducted at Munich, Germany, Tonawanda, New York, Burr Ridge, Illinois and Shanghai, China.

Patents and Trademarks – Linde owns or licenses a large number of patents that relate to a wide variety of products and processes. Linde's patents expire at various times over the next 20 years. While these patents and licenses are considered important to its individual businesses, Linde does not consider its business as a whole to be materially dependent upon any one particular patent, or patent license, or family of patents. Linde also owns a large number of trademarks, of which the "Linde" trademark is the most significant.

Raw Materials and Energy Costs – Energy is the single largest cost item in the production and distribution of industrial gases. Most of Linde's energy requirements are in the form of electricity, natural gas and diesel fuel for distribution. The company mitigates electricity, natural gas, and hydrocarbon price fluctuations contractually through pricing formulas, surcharges, and cost pass–through and tolling arrangements.

The supply of energy has not been a significant issue in the geographic areas where the company conducts business. However, energy availability and price is unpredictable and may pose unforeseen future risks.

For carbon dioxide, carbon monoxide, helium, hydrogen and specialty gases, raw materials are largely purchased from outside sources. Linde has contracts or commitments for, or readily available sources of, most of these raw materials; however, their long-term availability and prices are subject to market conditions.

Competition – Linde participates in highly competitive markets in industrial gases and engineering, which are characterized by a mixture of local, regional and global players, all of which exert competitive pressure on the parties. In locations where Linde has pipeline networks, which enable the company to provide reliable and economic supply of products to larger customers, Linde derives a competitive advantage.

Competitors in the industrial gases industry include global and regional companies such as L'Air Liquide S.A., Air Products and Chemicals, Inc., Messer Group GmbH, Mitsubishi Chemical Holdings Corporation (through Taiyo Nippon Sanso Corporation) as well as an extensive number of small to medium size independent industrial gas companies which compete locally as producers or distributors. In addition, a significant portion of the international gases market relates to customer-owned plants.

Employees – The company sources talent from an ever-changing and competitive environment. The ability to source and retain qualified and committed employees is a prerequisite for the company's success, and represents a general risk for Linde.

The Board of Directors ("Board") has established a strategic business objective to maintain world-class standards in talent management. Executive variable compensation is assessed annually based on performance in several strategic non-financial areas, including talent management. The Human Capital Committee assists the Board in its oversight of Linde's compensation and incentive policies and programs, and management development and succession, particularly in regard to reviewing executive compensation for Linde's executive officers. The Human Capital Committee also periodically reviews the company's diversity policies and objectives, and programs to achieve those objectives. The global head of Human Resources reports to the Chief Executive Officer ("CEO"). A global leader of Diversity and Inclusion reports to the head of Human Resources.

Linde has aligned diversity and inclusion with its business strategies and implemented diversity action planning into business process and performance management. Diversity and inclusion are line management responsibilities and Linde seeks competitive advantage through proactive management of its talent pipeline, procurement and recruiting processes. Linde provides equal employment opportunity, and recruits, hires, promotes and compensates people based solely on their merit and ability.

Employees receive a competitive salary and variable compensation components based on merit and depending on their position. Linde has collective bargaining agreements with unions at numerous locations throughout the world. Additional benefits are offered such as occupational pensions and contributions towards health insurance or medical screening, reflecting regional conditions and local competition. Managers' compensation is based on performance. Senior managers participate directly in the company's growth in value through the Long Term Incentive Plan of Linde plc. From time to time, Linde may introduce special compensation schemes to recognize or reward specific individuals such as the one implemented in 2020 for global front-line employees. Work-life balance is promoted by providing a range of opportunities that are based on the overall local conditions. Linde also invests in professional development of its employees through formal and on-the-job training.

As of December 31, 2021, Linde had 72,327 employees worldwide comprised of approximately 27 percent women and 73 percent men . The total professional workforce comprised of approximately 28 percent women and 72 percent men.

Environment – Information required by this item is incorporated herein by reference to the section captioned "Management's Discussion and Analysis – Environmental Matters" in Item 7 of this 10-K.

Available Information – The company makes its periodic and current reports available, free of charge, on or through its website, www.linde.com, as soon as practicable after such material is electronically filed with, or furnished to, the Securities and Exchange Commission ("SEC"). Investors may also access from the company website other investor information such as press releases and presentations. Information on the company's website is not incorporated by reference herein. In addition, the public may read and copy any materials filed with the SEC free of charge at the SEC's website, www.sec.gov, that contains reports, proxy information statements and other information regarding issuers that file electronically.

Executive Officers – The following Executive Officers have been elected by the Board of Directors and serve at the pleasure of the Board. It is expected that the Board will elect officers annually following each annual meeting of shareholders.

Stephen F. Angel, 66, has been Chief Executive Officer and a director of Linde since 2018. Effective March 1, 2022, Mr. Angel will retire from the position of Chief Executive Officer and assume the role of Chairman of the Board of Directors of Linde. Prior to his appointment as Chief Executive Officer of Linde, Mr. Angel was Chairman, President and CEO of Praxair, Inc. since 2007. Mr. Angel joined Praxair in 2001 as an Executive Vice President and was named President and Chief Operating Officer in February 2006. Prior to joining Praxair, Mr. Angel spent 22 years in a variety of management positions with General Electric. Mr. Angel serves on the board of directors of PPG Industries where he chairs the Human Capital Management and Compensation Committee and serves on the Nominating and Governance Committee. He also serves on the Hydrogen Council and is a member of The Business Council.

Sean Durbin, 51, became Executive Vice President, EMEA in April 2021. Previously, he served as Senior Vice President, Global Functions beginning in July 2020. Durbin joined Praxair, Inc. in 1993 and served in various roles across operations, engineering, project management, business development and sales. In recent years, he has held leadership positions including Business President, Region Europe South from 2019 to 2020, and President, Praxair Canada Inc. from 2013 to 2019.

Kelcey E. Hoyt, 52, became the Chief Accounting Officer of Linde in October 2018. Prior to this, she served as Vice President and Controller of Praxair, Inc. beginning in August 2016. Prior to becoming Controller, she served as Praxair's Director of Investor Relations since 2010. She joined Praxair in 2002 and served as Director of Corporate Accounting and SEC Reporting through 2008, and later served as Controller for various divisions within Praxair's North American Industrial Gas business. Previously, she was in audit at KPMG, LLP.

Sanjiv Lamba, 57, was appointed Chief Operating Officer of Linde effective January 1, 2021, and effective March 1, 2022, Mr. Lamba will become Chief Executive Officer of Linde. Previously, he served as the Executive Vice President, APAC, beginning in October 2018. Prior to that, Mr. Lamba was appointed a Member of the Executive Board of Linde AG in 2011, responsible for the Asia, Pacific segment of the Gases Division, for Global Gases Businesses Helium & Rare Gases, Electronics as well as Asia Joint Venture Management. Mr. Lamba started his career 1989 with BOC India in Finance where he progressed to become Director of Finance before being appointed as Managing Director for BOC's India's business in 2001. Throughout his years with BOC/Linde, he worked in various roles across a number of different geographies including Germany, the UK, Singapore and India.

Juergen Nowicki, 58, was appointed Executive Vice President and CEO, Linde Engineering in April 2020. Prior to this, he was Senior Vice President, Commercial, Linde Engineering. Mr. Nowicki joined Linde in 1991 as an Internal Auditor and held various positions in Finance and Controlling. In 2002, he was appointed CFO Linde Gas North America, USA, and was named Head of Finance and Control for The Linde Group in 2006. Nowicki assumed the role of Managing Director, Linde Engineering in 2011.

Dr. Andreas Opfermann, 50, became Executive Vice President, Clean Energy in June 2021. Previously, he was Executive Vice President Americas beginning in November 2019. Prior to this, from 2016-2019, he was the regional business unit leader for Linde's North European region. Dr. Opfermann joined Linde in 2005 initially in Corporate Strategy. He has subsequently served as Head of Innovation Management from 2008 to 2010, Head of Clean Energy and Innovation Management from 2010 to 2014, and Head of Technology and Innovation from 2015 to 2016, responsible for all Linde research and development. Before joining Linde, he held positions at McKinsey & Company.

John Panikar, 54, was appointed Executive Vice President, APAC of Linde effective in January 2021. Previously, he served as President UK & Africa of Linde since October 2018. From 2014 to 2018, Mr. Panikar was President of Praxair Asia. He began his career with Praxair in 1991 as an Applications Engineer. Over the years, Mr. Panikar held increasingly responsible positions including Manager of Site Services and Equipment, Business Development Director for Praxair Asia, Managing Director of Praxair India, VP, South Region, North American Industrial Gases and President, Praxair Distribution, Inc.

Matthew J. White, 49, became Executive Vice President and Chief Financial Officer of Linde in October 2018. He previously served as the Senior Vice President and Chief Financial Officer of Praxair, Inc. since January 1, 2014. Prior to this, Mr. White was President of Praxair Canada from 2011-2014. He joined Praxair in 2004 as finance director for the company’s largest business unit, North American Industrial Gases. In 2008, he became Vice President and Controller of Praxair, Inc., then was named Vice President and Treasurer in 2010. Before joining Praxair, White was vice president, finance, at Fisher Scientific and before that he held various financial positions, including group controller, at GenTek, a manufacturing and performance chemicals company.

ITEM 1A. RISK FACTORS

Due to the size and geographic reach of the company's operations, a wide range of factors, many of which are outside of the company's control, could materially affect the company's future operations and financial performance. Management believes the following risks may significantly impact the company:

The COVID-19 global pandemic could materially adversely affect our results of operations.

The COVID-19 global pandemic, including resurgences and variants of the virus that causes COVID-19, and efforts to reduce its spread have led, and may continue to lead to, significant changes in levels of economic activity and significant disruption and volatility in global markets. COVID-19 has resulted in authorities implementing numerous measures to try to contain the virus, such as travel bans and restrictions, quarantines, shelter in place orders, and shutdowns. These measures have impacted and may further impact our workforce and operations, the operations of our customers, vendors and suppliers. There is considerable uncertainty regarding such measures and potential future measures, and restrictions on our access to our manufacturing facilities or on our support operations or workforce, or similar limitations for our vendors and suppliers, and restrictions or disruptions of transportation, such as reduced availability of air transport, port closures, and increased border controls or closures, could limit our capacity to meet customer demand and have a material adverse effect on our results of operations. These restrictions and disruptions could affect our performance on our contracts.

Furthermore, COVID-19 has impacted and may further impact the broader economies of affected countries, including negatively impacting economic growth, the proper functioning of financial and capital markets, foreign currency exchange rates, and interest rates. Risks related to economic conditions are described in our Principal Risks and Uncertainties titled "Weakening economic conditions in markets in which Linde does business may adversely impact its financial results and/or cash flows" and "Macroeconomic factors may impact Linde's ability to obtain financing or increase the cost of obtaining financing which may adversely impact Linde's financial results and/or cash flows."

Weakening economic conditions in markets in which Linde does business may adversely impact its financial results and/or cash flows.

Linde serves a diverse group of industries across more than 100 countries, which generally leads to financial stability through various business cycles. However, a broad decline in general economic or business conditions in the industries served by its customers could adversely affect the demand for Linde's products and impair the ability of its customers to satisfy their obligations to Linde, resulting in uncollected receivables and/or unanticipated contract terminations or project delays. For example, global political and economic uncertainty could reduce investment activities of Linde's customers, which could adversely affect Linde's business.

In addition, many of Linde's customers are in businesses that are cyclical in nature, such as the chemicals, metals and energy industries. Downturns in these industries may adversely impact Linde during these cycles. Additionally, such conditions could impact the utilization of Linde's manufacturing capacity which may require it to recognize impairment losses on tangible assets such as property, plant and equipment, as well as intangible assets such as goodwill, customer relationships or intellectual property.

Increases in the cost of energy and raw materials and/or disruption in the supply of these materials could result in lost sales or reduced profitability.

Energy is the single largest cost item in the production and distribution of industrial gases. Most of Linde's energy requirements are in the form of electricity, natural gas and diesel fuel for distribution. Linde attempts to minimize the financial impact of variability in these costs through the management of customer contracts and reducing demand through operational productivity and energy efficiency. Large customer contracts typically have escalation and pass-through clauses to recover energy and feedstock costs. Such attempts may not successfully mitigate cost variability, which could negatively impact Linde's financial condition or results of operations. The supply of energy has not been a significant issue in the geographic areas where Linde conducts business. However, regional energy conditions are unpredictable and may pose future risk.

For carbon dioxide, carbon monoxide, helium, hydrogen and specialty gases, raw materials are largely purchased from outside sources. Where feasible, Linde sources several of these raw materials, including carbon dioxide, hydrogen and calcium carbide, as chemical or industrial byproducts. In addition, Linde has contracts or commitments for, or readily available sources of, most of these raw materials; however, their long-term availability and prices are subject to market conditions. A disruption in supply of such raw materials could impact Linde’s ability to meet contractual supply commitments.

Linde’s international operations are subject to the risks of doing business abroad and international events and circumstances may adversely impact its business, financial condition or results of operations.

Linde has substantial international operations which are subject to risks including devaluations in currency exchange rates, transportation delays and interruptions, political and economic instability and disruptions, restrictions on the transfer of funds, trade conflicts and the imposition of duties and tariffs, import and export controls, changes in governmental policies, labor unrest, possible nationalization and/or expropriation of assets, changes in U.S. and non-U.S. tax policies and compliance with governmental regulations. These events could have an adverse effect on the international operations of Linde in the future by reducing the demand for its products, decreasing the prices at which it can sell its products, reducing the revenue from international operations or otherwise having an adverse effect on its business.

Currency exchange rate fluctuations and other related risks may adversely affect Linde's results.

Because a significant portion of Linde's revenue is denominated in currencies other than its reporting currency, the U.S. dollar, changes in exchange rates will produce fluctuations in revenue, costs and earnings and may also affect the book value of assets and liabilities and related equity. Although the company from time to time utilizes foreign exchange forward contracts to hedge these exposures, its efforts to minimize currency exposure through such hedging transactions may not be successful depending on market and business conditions. As a result, fluctuations in foreign currency exchange rates could adversely affect Linde’s financial condition, results of operations or cash flows.

Macroeconomic factors may impact Linde’s ability to obtain financing or increase the cost of obtaining financing which may adversely impact Linde’s financial results and/or cash flows.

Volatility and disruption in the U.S., European and global credit and equity markets, from time to time, could make it more difficult for Linde to obtain financing for its operations and/or could increase the cost of obtaining financing. In addition, Linde’s borrowing costs can be affected by short- and long-term debt ratings assigned by independent rating agencies which are based, in significant part, on its performance as measured by certain criteria such as interest coverage and leverage ratios. A decrease in these debt ratings could increase the cost of borrowing or make it more difficult to obtain financing.

An impairment of goodwill or intangible assets could negatively impact the company's financial results.

As of December 31, 2021, the net carrying value of goodwill and other indefinite-lived intangible assets was $27 billion and $2 billion, respectively, primarily as a result of the business combination and the related acquisition method of accounting applied to Linde AG. In accordance with generally accepted accounting principles, the company periodically assesses these assets to determine if they are impaired. Significant negative industry or economic trends, disruptions to business, unexpected significant changes or planned changes in use of the assets, divestitures and sustained market capitalization declines may result in recognition of impairments to goodwill or other indefinite-lived assets. Any charges relating to such impairments could have a material adverse impact on Linde's results of operations in the periods recognized.

Catastrophic events could disrupt the operations of Linde and/or its customers and suppliers and may have a significant adverse impact on the results of operations.

The occurrence of catastrophic events or natural disasters such as extreme weather, including hurricanes and floods; health epidemics; and acts of war or terrorism, could disrupt or delay Linde’s ability to produce and distribute its products to customers and could potentially expose Linde to third-party liability claims. In addition, such events could impact Linde’s customers and suppliers resulting in temporary or long-term outages and/or the limitation of supply of energy and other raw materials used in normal business operations. Linde evaluates the direct and indirect business risks, consults with vendors, insurance providers and industry experts, makes investments in suitably resilient design and technology, and conducts regular reviews of the business risks with management. Despite these steps, however, these situations are outside Linde’s control and may have a significant adverse impact on its financial results.

The inability to attract and retain qualified personnel may adversely impact Linde's business.

If Linde fails to attract, hire and retain qualified personnel, it may not be able to develop, market or sell its products or successfully manage its business. Linde is dependent upon a highly skilled, experienced and efficient workforce to be successful. Much of Linde's competitive advantage is based on the expertise and experience of key personnel regarding marketing, technology, manufacturing and distribution infrastructure, systems and products. The inability to attract and hire qualified individuals or the loss of key employees in very skilled areas could have a negative effect on Linde's financial results.

If Linde fails to keep pace with technological advances in the industry or if new technology initiatives do not become commercially accepted, customers may not continue to buy Linde's products and results of operations could be adversely affected.

Linde's research and development is directed toward developing new and improved methods for the production and distribution of industrial gases, the design and construction of plants and toward developing new markets and applications for the use of industrial and process gases. This results in the introduction of new applications and the development of new advanced process technologies. As a result of these efforts, Linde develops new and proprietary technologies and employs necessary measures to protect such technologies within the global geographies in which Linde operates. These technologies help Linde to create a competitive advantage and to provide a platform to grow its business. If Linde's research and development activities do not keep pace with competitors or if Linde does not create new technologies that benefit customers, future results of operations could be adversely affected.

Risks related to pension benefit plans may adversely impact Linde's results of operations and cash flows.

Pension benefits represent significant financial obligations that will be ultimately settled in the future with employees who meet eligibility requirements. Because of the uncertainties involved in estimating the timing and amount of future payments and asset returns, significant estimates are required to calculate pension expense and liabilities related to Linde's plans. Linde utilizes the services of independent actuaries, whose models are used to facilitate these calculations. Several key assumptions are used in the actuarial models to calculate pension expense and liability amounts recorded in the consolidated financial statements. In particular, significant changes in actual investment returns on pension assets, discount rates, or legislative or regulatory changes could impact future results of operations and required pension contributions.

Operational risks may adversely impact Linde's business or results of operations.

Linde's operating results are dependent on the continued operation of its production facilities and its ability to meet customer contract requirements and other needs. Insufficient or excess capacity threatens Linde's ability to generate competitive profit margins and may expose Linde to liabilities related to contract commitments. Operating results are also dependent on Linde's ability to complete new construction projects on time, on budget and in accordance with performance requirements. Failure to do so may expose Linde's business to loss of revenue, potential litigation and loss of business reputation.

Also inherent in the management of Linde's production facilities and delivery systems, including storage, vehicle transportation and pipelines, are operational risks that require continuous training, oversight and control. Material operating failures at production, storage facilities or pipelines, including fire, toxic release and explosions, or the occurrence of vehicle transportation accidents could result in loss of life, damage to the environment, loss of production and/or extensive property damage, all of which may negatively impact Linde's financial results.

Linde may be subject to information technology system failures, network disruptions and breaches in data security.

Linde relies on information technology systems and networks for business and operational activities, and also stores and processes sensitive business and proprietary information in these systems and networks. These systems are susceptible to outages due to fire, flood, power loss, telecommunications failures, viruses, break-ins and similar events, or breaches of security.

Linde has taken steps to address these risks and concerns by implementing advanced security technologies, internal controls, network and data center resiliency and recovery process. Despite these steps, however, our information technology systems have in the past been and in the future will likely be subject to increasingly sophisticated cyber attacks.

Operational failures and breaches of security from such attempts could lead to the loss or disclosure of confidential information or personal data belonging to Linde or our employees and customers or suppliers. These failures and breaches could result in business interruption or malfunction and lead to legal or regulatory actions that could result in a material adverse impact on Linde's operations, reputation and financial results. To date, such attempts have not had any significant impact on Linde's operations or financial results.

The inability to effectively integrate acquisitions or collaborate with joint venture partners could adversely impact Linde's financial position and results of operations.

Linde has evaluated and expects to continue to evaluate, a wide array of potential strategic acquisitions and joint ventures. Many of these transactions, if consummated, could be material to its financial condition and results of operations. In addition, the process of integrating an acquired company, business or group of assets may create unforeseen operating difficulties and expenditures. Although historically Linde has been successful with its acquisition strategy and execution, the areas where Linde may face risks include:

- the need to implement or remediate controls, procedures and policies appropriate for a larger public company at companies that prior to the acquisition lacked these controls, procedures and policies;
- diversion of management time and focus from operating existing business to acquisition integration challenges;
- cultural challenges associated with integrating employees from the acquired company into the existing organization;
- the need to integrate each company's accounting, management information, human resources and other administrative systems to permit effective management;
- difficulty with the assimilation of acquired operations and products;
- failure to achieve targeted synergies and cost reductions; and
- inability to retain key employees and business relationships of acquired companies.

Foreign acquisitions and joint ventures involve unique risks in addition to those mentioned herein, including those related to integration of operations across different cultures and languages, currency risks and the particular economic, political and regulatory risks associated with specific countries.

Also, the anticipated benefit of potential future acquisitions may not materialize. Future acquisitions or dispositions could result in the incurrence of debt, contingent liabilities or amortization expenses, or impairments of goodwill, any of which could adversely impact Linde's financial results.

Linde is subject to a variety of international laws and government regulations and changes in, or failure to comply with, these laws or regulations could have an adverse impact on the company's business, financial position and results of operations.

Linde is subject to regulations in the following areas, among others:

- environmental protection, including climate change and energy efficiency laws and policies;
- U.S. and non-U.S. tax laws and currency controls;
- safety;
- securities laws applicable in the United States, the European Union, Germany, Ireland, and other jurisdictions;
- trade and import/export restrictions, as well as economic sanctions laws;
- antitrust matters;
- data protection;
- global anti-bribery laws, including the U.S. Foreign Corrupt Practices Act; and
- healthcare regulations.

Changes in these or other regulatory areas may impact Linde's profitability and may give rise to new or increased compliance risks: it may become more complex and costly to ensure compliance, and the level of sanctions in the event of non-compliance may rise. Noncompliance with such laws and regulations could result in penalties or sanctions, cancellation of marketing rights or restrictions on participation in, or even exclusion from, public tender proceedings, all of which could have a material adverse impact on Linde's financial results and/or reputation.

Such changes may also restrict Linde’s ability to compete effectively in the marketplace. Changes to regulations in the areas of environmental protection and climate change, for example, may impact customer and competitor behavior driving structural changes in key end markets. While Linde will work to mitigate these risks through the pursuit of strategic alliances and investment in applications technologies to capture new growth areas, given the uncertainty about the type and scope of new regulations, it is difficult to predict how such changes and their impact on market behavior will ultimately impact Linde’s business. However, such changes could have a material adverse impact on Linde's results of operations.

Doing business globally requires Linde to comply with anti-corruption, trade, compliance and economic sanctions and similar laws, and to implement policies and procedures designed to ensure that its employees and other intermediaries comply with the applicable restrictions. These restrictions include prohibitions on the sale or supply of certain products, services and any other economic resources to embargoed or sanctioned countries, governments, persons and entities. Compliance with these restrictions requires, among other things, screening of business partners. Despite its commitment to legal compliance and corporate ethics, the company cannot ensure that its policies and procedures will always protect it from intentional, reckless or negligent acts committed by employees or agents under the applicable laws. If Linde fails to comply with laws governing the conduct of international operations, Linde may be subject to criminal and civil penalties and other remedial measures, which could materially adversely affect its reputation, business and results of operations.

The outcome of litigation or governmental investigations may adversely impact the company’s business or results of operations.

Linde’s subsidiaries are party to various lawsuits and governmental investigations arising in the ordinary course of business. Adverse outcomes in some or all of the claims pending may result in significant monetary damages or injunctive relief that could adversely affect Linde’s ability to conduct business. Linde and its subsidiaries may in the future become subject to further claims and litigation, which is impossible to predict. The litigation and other claims Linde faces are subject to inherent uncertainties. Legal or regulatory judgments or agreed settlements might give rise to expenses which are not covered, or are not fully covered, by insurance benefits and may also lead to negative publicity and reputational damage. An unfavorable outcome or determination could cause a material adverse impact on the company’s results of operations.

Potential product defects or inadequate customer care may adversely impact Linde’s business or results of operations.

Risks associated with products and services may result in potential liability claims, the loss of customers or damage to Linde’s reputation. Principal possible causes of risks associated with products and services are product defects or an inadequate level of customer care when Linde is providing services.

Linde is exposed to legal risks relating to product liability in the countries where it operates, including countries such as the United States, where legal risks (in particular through class actions) have historically been more significant than in other countries. The outcome of any pending or future products and services proceedings or investigations cannot be predicted and legal or regulatory judgments or agreed settlements may give rise to significant losses, costs and expenses.

The manufacturing and sale of products as well as the construction and sale of plants by Linde may give rise to risks associated with the production, filling, storage, handling and transport of raw materials, goods or waste. Industrial gases are potentially hazardous substances and medical gases and the related healthcare services must comply with the relevant specifications in order to not adversely affect the health of patients treated with them.

Linde’s products and services, if defective or not handled or performed appropriately, may lead to personal injuries, business interruptions, environmental damages or other significant damages, which may result, among other consequences, in liability, losses, monetary penalties or compensation payments, environmental clean-up costs or other costs and expenses, exclusion from certain market sectors deemed important for future development of the business and loss of reputation. All these consequences could have a material adverse effect on Linde’s business and results of operations.

U.S. civil liabilities may not be enforceable against Linde.

Linde is organized under the laws of Ireland and substantial portions of its assets are located outside of the United States. In addition, certain directors and officers of Linde and its subsidiaries reside outside the United States. As a result, it may be difficult for investors to effect service of process within the United States upon Linde or such persons, or to enforce outside the United States judgments obtained against such persons in U.S. courts in any action, including actions predicated upon the civil liability provisions of the U.S. federal securities laws. In addition, it may be difficult for investors to enforce, in original actions brought in courts in jurisdictions located outside the United States, rights predicated upon the U.S. federal securities laws.

A judgment for the payment of money rendered by a court in the United States based on civil liability would not be automatically enforceable in Ireland. There is no treaty between Ireland and the United States providing for the reciprocal enforcement of foreign judgments. The following requirements must be met before the foreign judgment will be deemed to be enforceable in Ireland (i) the judgment must be for a definite sum, (ii) the judgment must be final and conclusive; and (iii) the judgment must be provided by a court of competent jurisdiction.

An Irish court will also exercise its right to refuse judgment if the foreign judgment (i) was obtained by fraud; (ii) violated Irish public policy; (iii) is in breach of natural justice; or (iv) if the judgment is irreconcilable with an earlier foreign judgment.

In addition, there is doubt as to whether an Irish court would accept jurisdiction and impose civil liability on Linde or such persons in an original action predicated solely upon the U.S. federal securities laws brought in a court of competent jurisdiction in Ireland against Linde or such member, officer or expert, respectively.

Changes in tax laws or policy could adversely impact the company's financial position or results of operations.

Linde and its subsidiaries are subject to the tax rules and regulations in the U.S., Germany, Ireland, the U.K. and other countries in which they operate. Those tax rules and regulations are subject to change on a prospective or retroactive basis. Under current economic and political conditions tax rates and policies in any jurisdiction, including the U.S., the U.K. and the EU, are subject to significant changes which could result in a significant change to Linde's current and deferred income tax. In particular, since Linde is currently treated as U.K. tax resident, any potential changes in the tax rules applying to U.K. tax-resident companies would directly affect Linde.

A change in Linde's tax residency could have a negative effect on the company's future profitability and may trigger taxes on dividends or exit charges. If Linde ceases to be resident in the U.K. and becomes resident in another jurisdiction, it may be subject to U.K. exit charges, and/or could become liable for additional tax charges in the other jurisdiction. If Linde were to be treated as resident in more than one jurisdiction, it could be subject to duplicative taxation. Furthermore, although Linde is incorporated in Ireland and is not expected to be treated as a domestic corporation for U.S. federal income tax purposes, it is possible that the IRS could challenge this result or that changes in U.S. federal income tax law could alter this result. If the IRS successfully asserted such a position or the law were to change, significant adverse tax consequences may result for Linde, the company and Linde's shareholders.

Changes in tax laws may result in higher tax expense and tax payments. In addition, changes in tax legislation and uncertainty about the tax environment in some regions may restrict Linde's opportunity to enforce its respective rights under the law. Linde also operates in countries with complex tax regulations which could be interpreted in different ways. Linde and its subsidiaries are subject to audits by taxing authorities in various jurisdictions or other review actions by the relevant financial or tax authorities. The ultimate tax outcome may differ from the amounts recorded in Linde's or its subsidiaries' financial statements and may materially affect their respective financial results for the period when such determination is made.

ITEM 1B. UNRESOLVED STAFF COMMENTS

Linde has received no written SEC staff comments regarding any of its Exchange Act reports which remain unresolved.

ITEM 2. PROPERTIES

Linde's principal executive offices are located in leased office space in Guildford, United Kingdom and owned office space in Danbury, Connecticut. Linde also owns principal administrative office space in Tonawanda, New York, United States and Pullach, Germany.

Due to the nature of Linde’s industrial gas products, it is generally uneconomical to transport them distances greater than a few hundred miles from the production facility. As a result, Linde operates a significant number of production facilities spread globally throughout a number of geographic regions.

The following is a description of production facilities for Linde by segment. No significant portion of these assets was leased at December 31, 2021. Generally, these facilities are utilized and are sufficient to meet the company's manufacturing needs.

Americas

The Americas segment operates production facilities primarily in the U.S., Canada, Mexico and Brazil, approximately 350 of which are mainly cryogenic air separation plants, hydrogen plants and carbon dioxide plants. There are five major pipeline complexes in North America located in northern Indiana, Houston, along the Gulf Coast of Texas, Detroit and Louisiana. Also located throughout the Americas are noncryogenic air separation plants, packaged gas facilities and other smaller plant facilities.

EMEA

The EMEA segment has production facilities primarily in Germany, France, Sweden, the Republic of South Africa, and the U.K. which include approximately 275 cryogenic air separation plants and carbon dioxide plants. Also located throughout Europe are noncryogenic air separation plants, hydrogen, packaged gas facilities and other smaller plant facilities.

APAC

The APAC segment has production facilities located primarily in China, Australia, India, South Korea and Thailand, approximately 230 of which are cryogenic air separation plants and carbon dioxide plants. Also located throughout Asia are noncryogenic air separation plants, hydrogen, packaged gas and other production facilities.

Engineering

The Linde Engineering business designs and constructs turnkey process plants for third-party customers as well as for the gases businesses in many locations worldwide, such as olefin plants, natural gas plants, air separation plants, hydrogen and synthesis gas plants. Plant components are produced in owned factories in Pullach and Tacherting, Germany; Hesinque, France; Oklahoma, United States; and Dalian, China.

ITEM 3. LEGAL PROCEEDINGS

Information required by this item is incorporated herein by reference to the section captioned “Notes to Consolidated Financial Statements – 17. Commitments and Contingencies” in Item 8 of this 10-K.

ITEM 4. MINE SAFETY DISCLOSURES

Not Applicable.

PART II

ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

Linde plc shares trade on the New York Stock Exchange ("NYSE") and the Frankfurt Stock Exchange ("FSE") under the ticker symbol "LIN". At December 31, 2021 there were 8,363 shareholders of record.

Purchases of Equity Securities – Certain information regarding purchases made by or on behalf of the company or any affiliated purchaser (as defined in Rule 10b-18(a)(3) under the Securities Exchange Act of 1934, as amended) of its ordinary shares during the three months ended December 31, 2021 is provided below:

Period	**Total Number of Shares Purchased *(Thousands)***	**Average Price Paid Per Share**	**Total Number of Shares Purchased as Part of Publicly Announced Program (1) *(Thousands)***	**Approximate Dollar Value of Shares that May Yet be Purchased Under the Program (2) *(Millions)***
October 2021	931	$ 304.49	931	$ 1,554
November 2021	1,570	$ 329.60	1,570	$ 1,037
December 2021	1,626	$ 333.23	1,626	$ 495
Fourth Quarter 2021	4,127	$ 325.37	4,127	$ 495

(1) On January 25, 2021 the company's board of directors approved the repurchase of $5.0 billion of its ordinary shares ("2021 program") which could take place from time to time on the open market (and could include the use of 10b5-1 trading plans), subject to market and business conditions. The 2021 program has a maximum repurchase amount of 15% of outstanding shares, began on February 1, 2021 and expires on July 31, 2023.

(2) As of December 31, 2021, the company repurchased $4.5 billion of its ordinary shares pursuant to the 2021 program, leaving an additional $0.5 billion authorized under the 2021 program.

On February 28, 2022 the company's board of directors approved the repurchase of $10.0 billion of its ordinary shares ("2022 program") which could take place from time to time on the open market (and could include the use of 10b5-1 trading plans), subject to market and business conditions. The 2022 program has a maximum repurchase amount of 15% of outstanding shares, beginning on March 1, 2022 and expires on July 31, 2024.

Peer Performance Table – The graph below compares the most recent five-year cumulative returns of the common stock of Praxair, the company's predecessor, through October 31, 2018 and Linde's ordinary shares for periods subsequent to October 31, 2018 with those of the Standard & Poor’s 500 Index ("SPX") and the S5 Materials Index ("S5MATR") which covers 28 companies, including Linde. The figures assume an initial investment of $100 on December 31, 2016 and that all dividends have been reinvested. lin-20211231_g1.jpg

	2016	**2017**	**2018**	**2019**	**2020**	**2021**
LIN	$100	$135	$139	$194	$244	$325
SPX	$100	$122	$117	$153	$181	$233
S5MATR	$100	$124	$106	$132	$159	$202

ITEM 6. RESERVED

Not applicable.

ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

The following discussion of the company's financial condition and results of operations should be read together with its consolidated financial statements and notes to the consolidated financial statements included in Item 8 of this Form 10-K.

BUSINESS OVERVIEW

The company's primary products in its industrial gases business are atmospheric gases (oxygen, nitrogen, argon, rare gases) and process gases (carbon dioxide, helium, hydrogen, electronic gases, specialty gases, acetylene). The company also designs, engineers, and builds equipment that produces industrial gases and offers its customers a wide range of gas production and processing services such as olefin plants, natural gas plants, air separation plants, hydrogen and synthesis gas plants and other types of plants.

Linde's industrial gas operations are managed on a geographical basis and in 2021 84% of sales were generated by Linde's three geographic segments (Americas, EMEA and APAC) and the remaining 16% are related primarily to the Engineering segment, and to a lesser extent Other (see Note 18 to the consolidated financial statements for operating segment details).

Linde serves a diverse group of industries including healthcare, chemicals and energy, manufacturing, metals and mining, food and beverage, and electronics. The diversity of end-markets supports financial stability for Linde in varied business cycles.

Linde generates most of its revenues and earnings in the following geographies where the company has its strongest market positions and where distribution and production operations allow the company to deliver the highest level of service to its customers at the lowest cost.

North and South America ("Americas")	Europe, Middle East and Africa ("EMEA")	Asia and Pacific ("APAC")
United States	Germany	China
Brazil	United Kingdom	Australia
Mexico	Eastern Europe	South Korea
Canada	South Africa	India

The company manufactures and distributes its industrial gas products through networks of thousands of production plants, pipeline complexes, distribution centers and delivery vehicles. Major pipeline complexes are primarily located in the United States and China. These networks are a competitive advantage, providing the foundation of reliable product supply to the company's customer base. The majority of Linde's business is conducted through long-term contracts which provide stability in cash flow and the ability to pass through changes in energy and feedstock costs to customers. The company has growth opportunities in all major geographies and in diverse end-markets such as healthcare, chemicals and energy, manufacturing, metals and mining, food and beverage, and electronics.

EXECUTIVE SUMMARY – FINANCIAL RESULTS & OUTLOOK

2021 Year in review

- Sales of $30,793 million were 13% above 2020 sales of $27,243 million. Volume growth across all end markets and project start-ups increased sales by 8% . Higher pricing across all geographic segments contributed 3% to sales. Favorable currency translation and higher cost pass-through increased sales by 5%, partially offset by the deconsolidation of a joint venture with operations in APAC which decreased sales by 3% .
- Reported operating profit of $4,984 million was 50% above 2020. Adjusted operating profit of $7,176 million was 24% above 2020. The increase in both reported and adjusted operating profit was primarily driven by higher volume and price and the benefit of cost reduction programs and other charges and productivity initiatives, partially offset by the deconsolidation of a joint venture with operations in APAC.*
- Income from continuing operations of $3,821 million and diluted earnings per share from continuing operations of $7.32 increased from $2,497 million and $4.70, respectively in 2020. Adjusted income from continuing operations of $5,579 million and adjusted diluted earnings per share from continuing operations of $10.69 were 28% and 30%, respectively above 2020 adjusted amounts.*
- Cash flow from operations of $9,725 million was 31% above 2020. Capital expenditures were $3,086 million; dividends paid were $2,189 million; net purchases of ordinary shares of $4,562 million; and debt repayments, net were $514 million.

*A reconciliation of the adjusted amounts can be found in the "Non-GAAP Financial Measures" section in this MD&A.

2022 Outlook

Linde provides quarterly updates on operating results, material trends that may affect financial performance, and financial guidance via earnings releases and investor teleconferences. These materials are available on the company’s website, www.linde.com, but are not incorporated herein.

CONSOLIDATED RESULTS AND OTHER INFORMATION

The discussion that follows includes a comparison of our results of operations and liquidity and capital resources for the years ended December 31, 2021 and 2020. For the discussion comparing the years ended December 31, 2020 and 2019, refer to Part II, Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations, of our Form 10-K for the year ended December 31, 2020.

The following table provides summary information for 2021 and 2020. The reported amounts are GAAP amounts from the Consolidated Statements of Income. The adjusted amounts are intended to supplement investors' understanding of the company's financial information and are not a substitute for GAAP measures.

(Millions of dollars, except per share data) **Year Ended December 31,**	**2021**	**2020**	**Variance**
Reported Amounts			
Sales	$ 30,793	$ 27,243	13 %
Cost of sales, exclusive of depreciation and amortization	$ 17,543	$ 15,383	14 %
As a percent of sales	57.0 %	56.5 %	
Selling, general and administrative	$ 3,189	$ 3,193	— %
As a percent of sales	10.4 %	11.7 %	
Depreciation and amortization	$ 4,635	$ 4,626	— %
Cost reduction programs and other charges (a)	$ 273	$ 506	(46)%
Operating Profit	$ 4,984	$ 3,322	50 %
Operating margin	16.2 %	12.2 %	
Interest expense – net	$ 77	$ 115	(33)%
Net pension and OPEB cost (benefit), excluding service cost	$ (192)	$ (177)	8 %
Effective tax rate	24.7 %	25.0 %	
Income from equity investments	$ 119	$ 85	40 %
Noncontrolling interests from continuing operations	$ (135)	$ (125)	8 %
Income from continuing operations	$ 3,821	$ 2,497	53 %
Diluted earnings per share from continuing operations	$ 7.32	$ 4.70	56 %
Diluted shares outstanding	521,875	531,157	(2)%
Number of employees	72,327	74,207	(3)%
Adjusted Amounts (b)			
Operating profit	$ 7,176	$ 5,797	24 %
Operating margin	23.3 %	21.3 %	
Income from continuing operations	$ 5,579	$ 4,371	28 %
Diluted earnings per share from continuing operations	$ 10.69	$ 8.23	30 %
Other Financial Data (b)			
EBITDA from continuing operations	$ 9,738	$ 8,033	21 %
As percent of sales	31.6 %	29.5 %	
Adjusted EBITDA from continuing operations	$ 10,179	$ 8,645	18 %
As percent of sales	33.1 %	31.7 %	

(a) See Note 3 to the consolidated financial statements.

(b) Adjusted amounts and Other Financial Data are non-GAAP performance measures. A reconciliation of reported amounts to adjusted amounts can be found in the "Non-GAAP Financial Measures" section of this MD&A.

Results of Operations

The following table provides a summary of changes in consolidated sales:

	2021 vs. 2020
	% Change
Factors Contributing to Changes - Sales	
Volume	8 %
Price/Mix	3 %
Cost pass-through	3 %
Currency	2 %
Acquisitions/divestitures	(3)%
Engineering	— %
	13 %

2021 Compared With 2020

Sales
Linde sales increased $3,550 million, or 13%, for the 2021 year versus 2020. Volume growth across all end markets and project start ups increased sales by 8%. Higher pricing across all geographic segments contributed 3% to sales. Currency translation increased sales by 2%, largely in EMEA and APAC, driven by the strengthening of the Euro, Australian dollar, Chinese yuan and British pound against the U.S. dollar. Cost pass-through, representing the contractual billing of energy cost variances primarily to onsite customers, increased sales by 3%, with minimal impact on operating profit. Divestitures decreased sales by 3% primarily driven by the deconsolidation of a joint venture with operations in APAC (see Note 2 to the consolidated financial statements).

Cost of sales, exclusive of depreciation and amortization
Cost of sales, exclusive of depreciation and amortization, increased $2,160 million, or 14%, for the year primarily due to higher volumes, cost pass-through and currency impacts, partially offset by productivity initiatives. Cost of sales, exclusive of depreciation and amortization, was 57.0% and 56.5% of sales, respectively, in 2021 compared to 2020. The increase as a percentage of sales was due primarily to higher cost pass-through.

Selling, general and administrative expenses
Selling, general and administrative expense ("SG&A") decreased $4 million, from $3,193 in 2020 to $3,189 million in 2021. SG&A was 10.4% of sales in 2021 versus 11.7% in 2020, primarily due to continued productivity initiatives and the impact of higher cost pass-through on sales. Currency impacts increased SG&A by approximately $62 million in 2021. Excluding currency impacts, underlying SG&A decreased due to continued productivity initiatives.

Depreciation and amortization
Reported depreciation and amortization expense increased $9 million versus 2020. The increase is primarily due to currency translation impacts, partially offset by a decrease related primarily to intangible assets acquired in the merger becoming fully amortized.

On an adjusted basis, depreciation and amortization expense increased $66 million, or 2%, versus 2020. The increase is primarily due to currency translation impacts which increased depreciation and amortization by approximately $60 million in 2021. Excluding currency impacts, underlying depreciation was relatively flat as the impact of new project start ups was largely offset by the decrease related to the deconsolidation of a joint venture with operations in APAC (see Note 2 to the consolidated financial statements).

Cost reduction programs and other charges
Linde recorded cost reduction programs and other charges of $273 million and $506 million for 2021 and 2020, respectively, primarily associated with the company's cost reduction program, which represents charges for achieving synergies and cost efficiencies related to the merger (see Note 3 to the consolidated financial statements).

On an adjusted basis, these costs have been excluded in both periods.

Operating profit

Reported operating profit increased $1,662 million in 2021, or 50%. On an adjusted basis, operating profit increased $1,379 million, or 24%, for 2021 versus 2020.

On a reported basis, operating profit increased $1,662 million, or 50% in 2021. The increase in the year was driven by higher volumes and price, partially offset by the deconsolidation of a joint venture with operations in APAC. Cost reduction programs and other charges were $273 million in 2021 and $506 million in 2020.

On an adjusted basis, which excludes the impacts of purchase accounting, cost reduction programs and other charges, operating profit increased $1,379 million, or 24%. Operating profit growth was driven by higher volume and price and the benefit of cost reduction programs and productivity initiatives, partially offset by the deconsolidation of a joint venture with operations in APAC. A discussion of operating profit by segment is included in the segment discussion that follows.

Interest expense - net

Reported interest expense – net in 2021 decreased $38 million, or 33%, versus 2020 . On an adjusted basis interest expense decreased $54 million, or 29% in 2021 as compared to 2020.

On both a reported and adjusted basis, the decrease year over year was driven by a lower effective borrowing rate and the impact of unfavorable foreign currency revaluation on an unhedged intercompany loan in the prior year.

Net pension and OPEB cost (benefit), excluding service cost

Reported net pension and OPEB cost (benefit), excluding service cost was a benefit of $192 million and $177 million in 2021 and 2020, respectively. The increase in benefit largely relates to a higher expected return on plan assets and lower interest costs, partially offset by higher amortization of deferred losses (see Note 16 to the consolidated financial statements).

Effective tax rate

The reported effective tax rate ("ETR") for 2021 was 24.7% versus 25.0% in 2020. The decrease is primarily driven by increased pre-tax income and jurisdictional mix. 2021 includes a deferred income tax charge related to the revaluation of net deferred tax liabilities for a tax rate increase in the United Kingdom, offset by a reduction to tax expense related to uncertain tax benefits and accrued interest and penalties of $47 million (see Note 5 to the consolidated financial statements).

On an adjusted basis, the ETR for 2021 was 24.1% versus 23.8% in 2020. The increase in the adjusted ETR is primarily due to lower tax benefits in 2021 relative to higher pre-tax income.

Income from equity investments

Reported income from equity investments for 2021 was $119 million as compared to $85 million in 2020. On an adjusted basis, income from equity investments for 2021 was $231 million versus $142 million in 2020.

On a reported basis, the increase in income from equity investments was primarily driven by the deconsolidation of a joint venture with operations in APAC which is reflected in equity income effective January 1, 2021, partially offset by a $35 million impairment charge related to a joint venture in the APAC segment in the third quarter of 2021.

On an adjusted basis, the increase in income from equity investments was primarily driven by the deconsolidation of a joint venture with operations in APAC which is reflected in equity income effective January 1, 2021.

Noncontrolling interests from continuing operations

At December 31, 2021, noncontrolling interests from continuing operations consisted primarily of noncontrolling shareholders’ investments in APAC (primarily in China) and surface technologies.

Reported noncontrolling interests from continuing operations increased $10 million, from $125 million in 2020 to $135 million in 2021, primarily driven by higher income from continuing operations, partially offset by the deconsolidation of a joint venture with operations in APAC (see Note 2 to the consolidated financial statements) and the buyout of minority shareholders in the Republic of South Africa.

Adjusted noncontrolling interests from continuing operations decreased $36 million in 2021 as compared to 2020, primarily driven by the deconsolidation of a joint venture with operations in APAC (See Note 2 to the consolidated financial statements) and the buyout of minority shareholders in the Republic of South Africa, which more than offset the increase from higher income from continuing operations.

Income from continuing operations

Reported income from continuing operations increased $1,324 million, or 53%, primarily due to higher overall operating profit.

On an adjusted basis, which excludes the impacts of purchase accounting and other non-GAAP adjustments, income from continuing operations increased $1,208 million, or 28%, in 2021 versus 2020. The increase was primarily due to higher adjusted operating profit.

Diluted earnings per share from continuing operations

Reported diluted earnings per share from continuing operations increased $2.62, or 56%, in 2021 as compared to 2020. On an adjusted basis, diluted EPS of $10.69 in 2021 increased 30% versus 2020. The increase on both reported and adjusted basis was primarily due to higher income from continuing operations and lower diluted shares outstanding.

Employees

The number of employees at December 31, 2021 was 72,327, a decrease of 3%, or 1,880 employees from December 31, 2020, primarily driven by cost reduction actions and divestitures.

Other Financial Data

EBITDA increased to $9,738 million in 2021 from $8,033 million in 2020. Adjusted EBITDA from continuing operations increased to $10,179 million for 2021 as compared to $8,645 million in 2020, primarily due to higher income from continuing operations versus the prior year period.

See the "Non-GAAP Financial Measures" section for definitions and reconciliations of these non-GAAP measures to reported GAAP amounts.

Other Comprehensive Income (Loss)

Other comprehensive income (loss) for the year ended December 31, 2021 of $358 million resulted primarily from currency translation adjustments of $1,175 million largely offset by an increase in the funded status of the company's retirement obligations of $746 million driven by a higher discount rate environment and strong asset performance. The translation adjustments reflect the impact of translating local currency foreign subsidiary financial statements to U.S. dollars, and are largely driven by the movement of the U.S. dollar against major currencies including the Euro, the Chinese yuan and the British pound. See the "Currency" section of the MD&A for exchange rates used for translation purposes and Note 7 to the consolidated financial statements for a summary of the currency translation adjustment component of accumulated other comprehensive income by segment.

Related Party Transactions

The company's related parties are primarily unconsolidated equity affiliates. The company did not engage in any material transactions involving related parties that included terms or other aspects that differ from those which would be negotiated with independent parties.

Environmental Matters

Linde's principal operations relate to the production and distribution of atmospheric and other industrial gases, which historically have not had a significant impact on the environment. However, worldwide costs relating to environmental protection may continue to grow due to increasingly stringent laws and regulations, and Linde's ongoing commitment to rigorous internal standards. In addition, Linde may face physical risks from climate change and extreme weather.

Climate Change

Linde operates in jurisdictions that have, or are developing, laws and/or regulations to reduce or mitigate the adverse effects of greenhouse gas ("GHG") emissions and faces a highly uncertain regulatory environment in this area. For example, the U.S. Environmental Protection Agency ("EPA") has promulgated rules requiring reporting of GHG emissions, and Linde and many of its suppliers and customers are subject to these rules. EPA has also promulgated regulations to restrict GHG emissions, including final rules regulating GHG emissions from light-duty vehicles and certain large manufacturing facilities, many of which are Linde suppliers or customers. In addition to these developments in the United States, several other countries worldwide have already implemented carbon taxation or trading systems which impact the company's customers and Linde operations, including regulations in China, Singapore and the European Union. Among other impacts, such regulations are expected to raise the cost of energy, which is a significant cost for Linde. Nevertheless, Linde's long-term customer contracts routinely provide rights to recover increased electricity, natural gas, and other costs that are incurred by the company as a result of climate change regulation.

Linde anticipates continued growth in its hydrogen business due to increased focus on lowering GHG emissions. Traditionally, hydrogen production plants and a large number of other manufacturing and electricity-generating plants have been identified in California and the European Union as a source of carbon dioxide emissions and these plants are subject to cap-and-trade regulations in those jurisdictions. Linde believes it will be able to mitigate the costs of these regulations through the terms of its product supply contracts. However, legislation that limits GHG emissions may impact growth by increasing capital, compliance, operating and maintenance costs and/or decreasing demand.

To manage business risks from current and potential GHG emission regulation as well as physical consequences of climate change, Linde actively monitors current developments, evaluates the direct and indirect business risks, and takes appropriate actions. Among others, actions include: increasing relevant resources and training; maintaining contingency plans; obtaining advice and counsel from expert vendors, insurance providers and industry experts; incorporating GHG provisions in commercial agreements; and conducting regular reviews of the business risks with management. Although there are considerable uncertainties, Linde believes that the business risk from potential regulations can be effectively managed through its commercial contracts. Additionally, Linde does not anticipate any material effects regarding its plant operations or business arising from potential physical risks of climate change.

Linde continuously seeks opportunities to optimize energy use and GHG emissions through research and development in customer applications and rigorous operational energy efficiency, sourcing renewable energy, and purchasing hydrogen as a chemical byproduct where feasible. Linde tracks GHG emission performance versus targets and reports regularly to business management and annually to Linde's Board of Directors. Effective November 2021, a new Sustainability Committee was created. The Committee is responsible for Board oversight of the Company's programs, policies and strategies related to environmental matters generally, including climate change, greenhouse gas reduction goals and decarbonization solutions, such as clean hydrogen and carbon capture.

At the same time, external factors may provide Linde with future business opportunities. Examples of such factors include governmental regulation of GHG and other emissions; uncertain costs of energy and certain natural resources; the development of renewable energy alternatives; and new technologies that help extract natural gas, improve air quality, increase energy efficiency and mitigate the impacts of climate change. Linde continues to develop new applications that can lower emissions and help customers lower energy consumption and increase product throughput. Stricter regulation of water quality in emerging economies such as China provide a growing market for a number of gases, e.g., oxygen for wastewater treatment. Increased concern about drought in areas such as California and Australia may create additional markets for carbon dioxide for desalination. Renewable fuel standards in the European Union and U.S. can create a market for second-generation biofuels which use industrial gases such as oxygen, carbon dioxide, and hydrogen.

Costs Relating to the Protection of the Environment

Environmental protection costs in 2021 were not significant. Linde anticipates that future annual environmental protection expenditures will be similar to 2021, subject to any significant changes in existing laws and regulations. Based on historical results and current estimates, management does not believe that environmental expenditures will have a material adverse effect on the consolidated financial position, the consolidated results of operations or cash flows in any given year.

Legal Proceedings

See Note 17 to the consolidated financial statements for information concerning legal proceedings.

Retirement Benefits

Pensions

The net periodic benefit cost (benefit) for the U.S. and non-U.S. pension plans was a benefit of $35 million and $28 million in 2021 and 2020, respectively, and costs of $107 million in 2019. 2019 net periodic pension cost included pension settlement charges of $97 million related to lump sum payments, which were triggered by either a change in control provision or merger-related divestitures, and a net curtailment charge of $8 million for termination benefits, primarily in connection with a defined benefit pension plan freeze. Settlement charges were $4 million and $6 million for 2021 and 2020, respectively.

The funded status (pension benefit obligation ("PBO") less the fair value of plan assets) for the U.S. plans was a deficit of $135 million and $436 million at December 31, 2021 and 2020, respectively. The funded status for non-U.S. plans was a deficit of $1,409 million and $2,334 million at December 31, 2021 and 2020, respectively. Both the U.S. and non-U.S.

plans derived the benefit from the actual return on plan assets, as well as favorability generated from a lower PBO due to an increase in discount rates.

Global pension contributions were $42 million in 2021, $91 million in 2020, and $94 million in 2019. At a minimum, Linde contributes to its pension plans to comply with local regulatory requirements (e.g., ERISA in the U.S.). Discretionary contributions in excess of the local minimum requirements are made based on many factors, including long-term projections of the plans' funded status, the economic environment, potential risk of overfunding, pension insurance costs and alternative uses of cash. Changes to these factors can impact the timing of discretionary contributions from year to year. Estimated required contributions for 2021 are currently expected to be in the range of $40 million to $50 million.

Linde assumes expected returns on plan assets for 2022 of 7.00% and 5.54% for the U.S. and non-U.S. plans, respectively, which are consistent with the long-term expected returns on its investment portfolios.

Excluding the impact of any settlements, 2022 consolidated pension expense is expected to be a benefit of approximately $91 million. The benefit derived from the expected return on assets assumption for Linde's most significant plans is anticipated to more than offset the expense from service and interest cost accruals and the higher amortization of deferred losses.

Refer to the Critical Accounting Policies section and Note 16 to the consolidated financial statements for a more detailed discussion of the company's retirement benefits, including a description of the various retirement plans and the assumptions used in the calculation of net periodic benefit cost (benefit) and funded status.

Insurance

Linde purchases insurance to limit a variety of property and casualty risks, including those related to property, business interruption, third-party liability and workers' compensation. Currently, the company self retains up to $10 million per occurrence for vehicle liability in the United States, $5 million per occurrence for workers' compensation and general liability. In addition, the company self retains risk up to €5 million at its various properties worldwide for property damage resulting from fire, flood and other perils affecting its properties along with a separate €5 million deductible on all business interruption resulting from a major peril loss. To mitigate its aggregate loss potential above these retentions, the company purchases catastrophic insurance coverage from highly rated insurance companies. The company does not currently operate or participate in any captive insurance companies or other non-traditional risk transfer alternatives.

At December 31, 2021 and 2020, the company had recorded a total of $75 million and $71 million, respectively, representing an estimate of the retained liability for the ultimate cost of claims incurred and unpaid as of the balance sheet dates. The estimated liability is established using statistical analysis and is based upon historical experience, actuarial assumptions and professional judgment. These estimates are subject to the effects of trends in loss severity and frequency and are subject to a significant degree of inherent variability. If actual claims differ from the company's estimates, they will be adjusted at that time and financial results could be impacted.

Linde recognizes estimated insurance proceeds relating to damages at the time of loss only to the extent of incurred losses. Any insurance recoveries for business interruption and for property damages in excess of the net book value of the property are recognized only when realized or pending payments confirmed by its insurance companies.

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SEGMENT DISCUSSION

Linde’s operations consist of two major product lines: industrial gases and engineering. As further described in the following paragraph, Linde’s industrial gases operations are managed on a geographic basis, which represents three of the company's reportable segments - Americas, EMEA (Europe/Middle East/Africa), and APAC (Asia/South Pacific); a fourth reportable segment which represents the company's Engineering business which designs and manufactures equipment for air separation and other industrial gas applications specifically for end customers and is managed on a worldwide basis operating in all geographic segments. Other consists of corporate costs and a few smaller businesses which individually do not meet the quantitative thresholds for separate presentation.

The industrial gases product line centers on the manufacturing and distribution of atmospheric gases (oxygen, nitrogen, argon, rare gases) and process gases (carbon dioxide, helium, hydrogen, electronic gases, specialty gases, acetylene). Many of these products are co-products of the same manufacturing process. Linde manufactures and distributes nearly all of its products and manages its customer relationships on a regional basis. Linde’s industrial gases are distributed to various end-markets within a regional segment through one of three basic distribution methods: on-site or tonnage; merchant or bulk; and packaged or cylinder gases. The distribution methods are generally integrated in order to best meet the customer’s needs and very few of its products can be economically transported outside of a region. Therefore, the distribution economics are specific to the various geographies in which the company operates and are consistent with how management assesses performance.

The company’s measure of profit/loss for segment reporting purposes is segment operating profit. Segment operating profit is defined as operating profit excluding purchase accounting impacts of the Linde AG merger, intercompany royalties, and items not indicative of ongoing business trends. This is the manner in which the company’s Chief Operating Decision Maker ("CODM") assesses performance and allocates resources.

The table below presents sales and operating profit information about reportable segments and Other for the years ended December 31, 2021 and 2020.

(Millions of dollars) **Year Ended December 31,**	**2021**	**2020**	**Variance**
Sales			
Americas	$ 12,103	$ 10,459	16 %
EMEA	7,643	6,449	19 %
APAC	6,133	5,687	8 %
Engineering	2,867	2,851	1 %
Other	2,047	1,797	14 %
Total sales	$ 30,793	$ 27,243	13 %
Operating Profit			
Americas	$ 3,368	$ 2,773	21 %
EMEA	1,889	1,465	29 %
APAC	1,502	1,277	18 %
Engineering	473	435	9 %
Other	(56)	(153)	63 %
Segment operating profit	7,176	5,797	24 %
Reconciliation to reported operating profit :			
Cost reduction programs and other charges (Note 3)	(273)	(506)	
Purchase accounting impacts - Linde AG	(1,919)	(1,969)	
Total operating profit	$ 4,984	$ 3,322	

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Americas

(Dollar amounts in millions)			Variance
Year Ended December 31,	2021	2020	2021 vs. 2020
Sales	$ 12,103	$ 10,459	16 %
Operating profit	$ 3,368	$ 2,773	21 %
As a percent of sales	27.8 %	26.5 %	

	2021 vs. 2020
	% Change
Factors Contributing to Changes - Sales	
Volume	9 %
Price/Mix	3 %
Cost pass-through	3 %
Currency	1 %
Acquisitions/Divestitures	— %
	16 %

The Americas segment includes Linde’s industrial gases operations in approximately 20 countries including the United States, Canada, Mexico and Brazil.

Sales

Sales for the Americas segment increased $1,644 million, or 16%, in 2021 versus 2020. Higher pricing contributed 3% to sales. Higher volumes increased sales by 9%, led by higher demand across all end markets and project start-ups. Currency translation increased sales by 1%, primarily driven by the strengthening of the Canadian dollar and Mexican peso against the U.S. Dollar. Cost past-through increased sales by 3% with minimal impact on operating profit.

Operating Profit

Operating profit in the Americas segment increased $595 million, or 21%, in 2021 versus 2020. Operating profit increased due primarily to higher pricing and volumes and continued productivity initiatives.

EMEA

(Dollar amounts in millions)			Variance
Year Ended December 31,	2021	2020	2021 vs. 2020
Sales	$ 7,643	$ 6,449	19 %
Operating profit	$ 1,889	$ 1,465	29 %
As a percent of sales	24.7 %	22.7 %	

	2021 vs. 2020
	% Change
Factors Contributing to Changes - Sales	
Volume	5 %
Price/Mix	4 %
Cost pass-through	6 %
Currency	5 %
Acquisitions/Divestitures	(1)%
	19 %

The EMEA segment includes Linde's industrial gases operations in approximately 45 European, Middle Eastern and African countries including Germany, France, Sweden, the Republic of South Africa, and the U.K.

Sales

EMEA segment sales increased $1,194 million, or 19%, in 2021 versus 2020. Volumes increased 5% driven by increased demand across all end markets. Currency translation increased sales by 5% due to the strengthening of the Euro, British pound and Swedish Krona against the U.S. dollar. Higher price contributed 4% to sales. Cost pass-through, representing the contractual billing of energy cost variances primarily to onsite customers increased sales by 6% with minimal impact on operating profit. Sales decreased 1% related to the divestiture of a non-core business in Scandinavia.

Operating Profit

Operating Profit for the EMEA segment increased $424 million, or 29%, in 2021 versus 2020 driven primarily by higher price and volumes and continued productivity initiatives.

APAC

(Dollar amounts in millions)			Variance
Year Ended December 31,	**2021**	**2020**	**2021 vs. 2020**
Sales	$ 6,133	$ 5,687	8 %
Operating profit	$ 1,502	$ 1,277	18 %
As a percent of sales	24.5 %	22.5 %	

	2021 vs. 2020
	% Change
Factors Contributing to Changes - Sales	
Volume/Equipment	11 %
Price/Mix	2 %
Cost pass-through	2 %
Currency	5 %
Acquisitions/Divestitures	(12)%
	8 %

The APAC segment includes Linde's industrial gases operations in approximately 20 Asian and South Pacific countries and regions including China, Australia, India and South Korea.

Sales

Sales for the APAC segment increased $446 million, or 8%, in 2021 versus 2020. Volumes increased 11% driven by increased demand across all end markets, led by cyclical end markets and electronics and project start-us. Higher price increased sales by 2%. Currency translation increased sales by 5% driven primarily by the strengthening of the Chinese yuan, Australian dollar and Korean won against the U.S. dollar. Cost pass-through increased sales by 2% with minimal impact on operating profit. Divestitures decreased sales by 12% primarily due to the deconsolidation of a joint venture with operations in Taiwan which decreased sales by $639 million (See Note 2 to the consolidated financial statements).

Operating Profit

Operating profit in the APAC segment increased $225 million, or 18%, in 2021 versus 2020. Higher volumes and price, and continued productivity initiatives were partially offset by a $126 million reduction due to the deconsolidation of the joint venture with operations in Taiwan.

Engineering

(Dollar amounts in millions)			Variance
Year Ended December 31,	2021	2020	2021 vs. 2020
Sales	$ 2,867	$ 2,851	1 %
Operating profit	$ 473	$ 435	9 %
As a percent of sales	16.5 %	15.3 %	

	2021 vs. 2020
	% Change
Factors Contributing to Changes - Sales	
Volume	(3)%
Currency	4 %
	1 %

Sales

Engineering segment sales increased $16 million, or 1%, in 2021 versus 2020, driven by project timing, partially offset by currency impacts which increased sales by 4% .

Operating profit

Engineering segment operating profit increased $38 million, or 9%, in 2021 versus 2020 driven primarily by currency, favorable cost performance and project timing.

Other

(Dollar amounts in millions)			Variance
Year Ended December 31,	2021	2020	2021 vs. 2020
Sales	$ 2,047	$ 1,797	14 %
Operating profit	$ (56)	$ (153)	63 %
As a percent of sales	(2.7)%	(8.5)%	

	2021 vs. 2020
	% Change
Factors Contributing to Changes - Sales	
Volume/Price	11 %
Cost pass-through	— %
Currency	3 %
Acquisitions/Divestitures	— %
	14 %

Other consists of corporate costs and a few smaller businesses including: Surface Technologies, GIST, and global helium wholesale; which individually do not meet the quantitative thresholds for separate presentation.

Sales

Sales for Other increased $250 million, or 14%, in 2021 versus 2020. Higher volumes and price increased sales by 11%. Currency translation increased sales 3%.

Operating profit

Operating profit in Other increased $97 million, or 63%, in 2021 versus 2020, due primarily to volume growth, higher price and continued productivity initiatives.

Currency

The results of Linde’s non-U.S. operations are translated to the company’s reporting currency, the U.S. dollar, from the functional currencies used in the countries in which the company operates. For most foreign operations, Linde uses the local currency as its functional currency. There is inherent variability and unpredictability in the relationship of these functional currencies to the U.S. dollar and such currency movements may materially impact Linde’s results of operations in any given period.

To help understand the reported results, the following is a summary of the significant currencies underlying Linde’s consolidated results and the exchange rates used to translate the financial statements (rates of exchange expressed in units of local currency per U.S. dollar):

	Percent of 2021	Statements of Income		Balance Sheets	
	Consolidated	Average Year Ended December 31,		December 31,	
Currency	Sales	2021	2020	2021	2020
Euro	21 %	0.85	0.88	0.88	0.82
Chinese yuan	9 %	6.45	6.90	6.36	6.53
British pound	7 %	0.73	0.78	0.74	0.73
Australian dollar	4 %	1.33	1.45	1.38	1.30
Brazilian real	4 %	5.39	5.11	5.58	5.20
Korean won	3 %	1,144	1,178	1,189	1,087
Canadian dollar	3 %	1.25	1.34	1.26	1.27
Mexican peso	2 %	20.28	21.35	20.53	19.91
Indian rupee	2 %	73.91	74.08	74.34	73.07
Republic of South African rand	2 %	14.77	16.37	15.94	14.69
Swedish krona	1 %	8.58	9.18	9.05	8.23
Thailand bhat	1 %	31.93	31.28	33.40	29.96
Russian ruble	1 %	73.69	71.95	74.68	74.04

LIQUIDITY, CAPITAL RESOURCES AND OTHER FINANCIAL DATA

(Millions of dollars) Year Ended December 31,	2021	2020
Net Cash Provided by (Used for)		
Operating Activities		
Income from continuing operations (including noncontrolling interests)	$ 3,956	$ 2,622
Non-cash charges (credits):		
Add: Cost reduction programs and other charges, net of payments (a)	98	258
Add: Depreciation and amortization	4,635	4,626
Add (Less): Deferred income taxes	(254)	(369)
Add (Less): non-cash charges and other	109	285
Income from continuing operations adjusted for non-cash charges and other	8,544	7,422
Less: Pension contributions	(42)	(91)
Add (Less): Working capital	1,148	364
Add (Less): Other	75	(266)
Net cash provided by operating activities	$ 9,725	$ 7,429
Investing Activities		
Capital expenditures	$ (3,086)	$ (3,400)
Acquisitions, net of cash acquired	(88)	(68)
Divestitures and asset sales, net of cash divested	167	482
Net cash provided by (used for) investing activities	$ (3,007)	$ (2,986)
Financing Activities		
Debt increases (decreases) – net	$ (514)	$ 1,313
Issuances (purchases) of ordinary shares – net	(4,562)	(2,410)
Cash dividends – Linde plc shareholders	(2,189)	(2,028)
Noncontrolling interest transactions and other	(323)	(220)
Net cash (used) for financing activities	$ (7,588)	$ (3,345)
Effect of exchange rate changes on cash	$ (61)	$ (44)
Cash and cash equivalents, end-of-period	$ 2,823	$ 3,754

(a) See Note 3 to the consolidated financial statements.

Cash decreased $931 million in 2021 versus 2020. The primary sources of cash in 2021 were cash flows from operations of $9,725 million. The primary uses of cash included capital expenditures of $3,086 million, net purchases of ordinary shares of $4,562 million, and cash dividends to shareholders of $2,189 million.

Cash Flows From Operations

2021 compared with 2020

Cash flows from operations was $9,725 million, an increase of $2,296 million, or 31% from 2020. The increase was driven by higher net income adjusted for non-cash charges and lower working capital requirements, including an increase in contract liabilities due to engineering customer advanced payments, which more than offset higher cash taxes. Cost reduction programs and other charges, net of payments was $98 million and $258 million for the years ended December 31, 2021 and 2020, respectively, representing charges of $273 million and $506 million net of related cash outflows of $175 million and $248 million, respectively, in each period.

Investing

2021 compared with 2020

Net cash used for investing activities was $3,007 million in 2021 compared to $2,986 million in 2020. The increase was primarily driven by lower proceeds from divestitures in 2021, largely offset by lower capital expenditures.

Capital expenditures in 2021 were $3,086 million, a decrease of $314 million from 2020. Capital expenditures during 2021 related primarily to investments in new plant and production equipment for growth. Approximately 42% of the capital expenditures were in the Americas segment with 32% in the APAC segment and the rest primarily in the EMEA segment.

At December 31, 2021 , Linde's sale of gas backlog of large projects under construction was approximately $3.5 billion. This represents the total estimated capital cost of large plants under construction.

Acquisition expenditures in 2021 were $88 million, an increase of $20 million from 2020 and related primarily to acquisitions in the Americas and EMEA. Acquisitions for the year ended December 31, 2020 were $68 million and related to acquisitions in the Americas and APAC.

Divestitures and asset sales in 2021 totaled $167 million as compared to $482 million in 2020. The 2020 period includes net proceeds from merger-related divestitures of $98 million from the sale of selected assets of Linde China and proceeds of approximately $130 million related to the divestiture of a non-core business in Scandinavia.

Financing

Linde's financing strategy is to secure long-term committed funding by issuing public notes and debentures and commercial paper backed by a long-term bank credit agreement. Linde's international operations are funded through a combination of local borrowing and intercompany funding to minimize the total cost of funds and to manage and centralize currency exchange exposures. As deemed necessary, Linde manages its exposure to interest-rate changes through the use of financial derivatives (see Note 12 to the consolidated financial statements and Item 7A. Quantitative and Qualitative Disclosures About Market Risk).

Cash used for financing activities was $7,588 million in 2021 compared to $3,345 million in 2020. Cash used for debt was $514 million in 2021 versus cash provided by debt of $1,313 million in 2020 primarily due to lower proceeds from debt issuances and decreased commercial paper borrowings, partially offset by lower debt repayments. Net purchases of ordinary shares were $4,562 million in 2021 versus $2,410 million in 2020. Cash dividends increased to $2,189 million in 2021 versus $2,028 million in 2020 driven primarily by a 10% increase in dividends per share from $3.852 per share to $4.24 per share. Cash used for Noncontrolling interest transactions and other was $323 million for the year ended December 31, 2021 versus cash used of $220 million for the respective 2020 period primarily due to the settlement of the buyout of minority interests in the Republic of South Africa in January of 2021.

The company believes that it has sufficient operating flexibility, cash reserves, and funding sources to maintain adequate amounts of liquidity to meet its business needs around the world. At December 31, 2021, Linde's credit ratings as reported by Standard & Poor's and Moody's were A-1 and P-1 for short-term debt, respectively, and A and A2 for long-term debt, respectively.

Note 11 to the consolidated financial statements includes information with respect to the company's debt activity in 2021, current debt position, debt covenants and the available credit facilities; and Note 12 includes information relating to derivative financial instruments. Linde's credit facilities are with major financial institutions and are non-cancelable until maturity. Therefore, the company believes the risk of the financial institutions being unable to make required loans under the credit facilities, if requested, to be low. Linde's major bank credit and long-term debt agreements contain standard covenants. The company was in compliance with these covenants at December 31, 2021 and expects to remain in compliance for the foreseeable future.

The company maintains a $5 billion unsecured and undrawn revolving credit agreement with no associated financial covenants. No borrowings were outstanding under the credit agreement as of December 31, 2021. The company does not anticipate any limitations on its ability to access the debt capital markets and/or other external funding sources and remains committed to its strong ratings from Moody's and Standard & Poor's.

Linde's total net debt outstanding at December 31, 2021 was $11,384 million, $1,016 million lower than $12,400 million at December 31, 2020. The December 31, 2021 net debt balance includes $13,069 million in public securities, $1,138 million representing primarily worldwide bank borrowings, net of $2,823 million of cash. Linde's global effective borrowing rate was approximately 1.4% for 2021.

In June 2021, Linde repaid €600 million of 3.875% notes that became due. In September 2021, Linde issued €700 million of 0.000% notes due 2026, €500 million of 0.375% notes due 2033, and €700 million of 1.000% notes due 2051. In November 2021, Linde repaid $600 million of 2.45% notes that were due in 2022. There was no impact to interest within the consolidated statements of income (see Note 11 to the consolidated financial statements).

In January 2022, Linde repaid €1.0 billion of 0.250% notes that became due in 2022.

On February 28, 2022, the company's Board of Directors approved the additional repurchase of $10.0 billion of its ordinary shares. For additional information related to the share repurchase programs, see Part II Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities.

OFF-BALANCE SHEET ARRANGEMENTS

As discussed in Note 17 to the consolidated financial statements, at December 31, 2021, Linde had undrawn outstanding letters of credit, bank guarantees and surety bonds entered into in connection with normal business operations and they are not reasonably likely to have a material impact on Linde's consolidated financial condition, results of operations, or liquidity.

CRITICAL ACCOUNTING ESTIMATES

The policies discussed below are considered by management to be critical to understanding Linde's financial statements and accompanying notes prepared in accordance with accounting principles generally accepted in the United States ("U.S. GAAP"). Their application places significant importance on management's judgment as a result of the need to make estimates of matters that are inherently uncertain. Linde's financial position, results of operations and cash flows could be materially affected if actual results differ from estimates made. These policies are determined by management and have been reviewed by Linde's Audit Committee.

Revenue Recognition

Long-Term Construction Contracts

The company designs and manufactures equipment for air separation and other varied gas production and processing plants manufactured specifically for end customers. Revenues for sale of equipment contracts are generally recognized over time as Linde has an enforceable right to payment for performance completed to date and performance does not create an asset with alternative use. For contracts recognized over time, revenue is recognized primarily using a cost incurred input method. Costs incurred to date relative to total estimated costs at completion are used to measure progress toward satisfying performance obligations. The result is applied to total expected revenue and results in financial statement recognition of revenue in addition to costs incurred to date. Any expected loss on a contract is recognized as an expense immediately. Contract modifications are typically accounted for as part of the existing contract and are recognized as a cumulative adjustment for the inception-to-date effect of such change. We assess performance as progress towards completion is achieved on specific projects, earnings will be impacted by changes to our forecast of revenues and costs on these projects.

The cost incurred input method places considerable importance on accurate estimates of the extent of progress towards completion and may involve estimates on the scope of deliveries and services required to fulfill the contractually defined obligations. The key source of estimation uncertainty is the total estimated costs at completion including material, labor and overhead costs and the resultant state of completion of the contracts. There are inherent uncertainties associated with the estimation process, including technical complexity, duration of construction cycle, potential cost inflation (whether equipment or manpower), and scope considerations all of which may affect the total estimation process. Changes in these estimates may lead to a significant impact on future financial statements.

Pension Benefits

Pension benefits represent financial obligations that will be ultimately settled in the future with employees who meet eligibility requirements. Because of the uncertainties involved in estimating the timing and amount of future payments, significant estimates are required to calculate pension expense and liabilities related to the company's plans. The company utilizes the services of independent actuaries, whose models are used to facilitate these calculations.

Several key assumptions are used in actuarial models to calculate pension expense and liability amounts recorded in the financial statements. Management believes the three most significant variables in the models are the expected long-term rate of return on plan assets, the discount rate, and the expected rate of compensation increase. The actuarial models also use assumptions for various other factors, including long-term inflation rates, employee turnover, retirement age, and mortality. Linde management believes the assumptions used in the actuarial calculations are reasonable, reflect the company’s experience and expectations for the future and are within accepted practices in each of the respective geographic locations in which it operates. Actual results in any given year will often differ from actuarial assumptions because of economic and other factors. The sensitivities to each of the key assumptions presented below exclude the impact of special items that occurred during the year.

The weighted-average expected long-term rates of return on pension plan assets were 7.00% for U.S. plans and 5.28% for non-U.S. plans for the year ended December 31, 2021 (7.00% and 5.31%, respectively at December 31, 2020). The expected long-term rate of return on the U.S. and Non-U.S. plan assets is estimated based on the plans' investment strategy and asset allocation, historical capital market performance and, to a lesser extent, historical plan performance. A 0.50% change in these expected long-term rates of return, with all other variables held constant, would change Linde’s pension expense by approximately $46 million.

The company has consistently used a market-related value of assets rather than the fair value at the measurement date to determine annual pension expense. The market-related value recognizes investment gains or losses over a five-year period. As a result, changes in the fair value of assets from year to year are not immediately reflected in the company’s annual pension expense. Instead, annual pension expense in future periods will be impacted as deferred investment gains or losses are recognized in the market-related value of assets over the five-year period. The consolidated market-related value of assets was $9,612 million, or $804 million lower than the fair value of assets of $10,416 million at December 31, 2021. These net deferred investment losses of $804 million will be recognized in the calculation of the market-related value of assets ratably over the next four years and will impact future pension expense. Future actual investment gains or losses will impact the market-related value of assets and, therefore, will impact future annual pension expense in a similar manner.

Discount rates are used to calculate the present value of plan liabilities and pension costs and are determined annually by management. The company measures the service and interest cost components of pension and OPEB expense for significant U.S. and non-U.S. plans using the spot rate approach. U.S. plans that do not use the spot rate approach continue to determine discount rates by using a cash flow matching model provided by the company's independent actuaries. The model includes a portfolio of corporate bonds graded Aa or better by at least half of the ratings agencies and matches the U.S. plans' projected cash flows to the calculated spot rates. Discount rates for the remaining Non-U.S. plans are based on market yields for high-quality fixed income investments representing the approximate duration of the pension liabilities on the measurement date. Refer to Note 16 to the consolidated financial statements for a summary of the discount rates used to calculate plan liabilities and benefit costs, and to the Retirement Benefits section of the Consolidated Results and Other Information section of this MD&A for a further discussion of 2021 benefit costs. A 0.50% reduction in discount rates, with all other variables held constant, would increase Linde’s pension expense by approximately $52 million whereas a 0.50% increase in discount rates would result in a decrease of $47 million. A 0.50% reduction in discount rates would increase the PBO by approximately $951 million whereas a 0.50% increase in discount rates would have a favorable impact to the PBO of approximately $841 million.

The weighted-average expected rate of compensation increase was 3.25% for U.S. plans and 2.55% for non-U.S. plans at December 31, 2021 (3.25% and 2.55%, respectively, at December 31, 2020). The estimated annual compensation increase is determined by management every year and is based on historical trends and market indices. A 0.50% change in the expected rate of compensation increase, with all other variables held constant, would change Linde’s pension expense by approximately $8 million and would impact the PBO by approximately $54 million.

Asset Impairments

Goodwill and Other Indefinite-Lived Intangibles Assets

At December 31, 2021, the company had goodwill of $27,038 million and $1,813 million of other indefinite-lived intangible assets. Goodwill represents the aggregate of the excess consideration paid for acquired businesses over the fair value of the net assets acquired. Indefinite-lived other intangibles relate to the Linde name.

The company performs a goodwill impairment test annually or more frequently if events or circumstances indicate that an impairment loss may have been incurred.

The impairment tests performed during the fourth quarter of 2021 indicated no impairment. At December 31, 2021, Linde’s enterprise value was approximately $188 billion (outstanding shares multiplied by the year-end stock price plus net debt, and without any control premium) while its total capital was approximately $57 billion.

The impairment test allows an entity to first assess qualitative factors to determine if it is more likely than not that the fair value of a reporting unit is less than carrying value. If it is determined that it is more likely than not that the fair value of a reporting unit is less than carrying value then the company will estimate and compare the fair value of its reporting units to their carrying value, including goodwill. Reporting units are determined based on one level below the operating segment level.

Management believes that the quantitative and qualitative factors used to perform its annual goodwill impairment assessment are appropriate and reasonable. Although the 2021 assessment indicated that it is more likely than not that the fair value of each reporting unit exceeded its carrying value, changes in circumstances or conditions affecting this analysis could have a significant impact on the fair value determination, which could then result in a material impairment charge to the company's results of operations. Reporting units with greater concentration of Linde AG assets fair valued during the 2018 Praxair, Inc. and Linde AG merger are at greater risk of impairment in future periods.

Other indefinite-lived intangible assets are evaluated for impairment on an annual basis or more frequently if events and circumstances indicate that an impairment loss may have been incurred, and no impairments were indicated.

See Notes 9 and 10 to the consolidated financial statements.

Long-Lived Assets

Long-lived assets, including property, plant and equipment and finite-lived other intangible assets, are tested for impairment whenever events or changes in circumstances indicate that the carrying amount of an individual asset or asset group may not be recoverable. For purposes of this test, asset groups are determined based upon the lowest level for which there are independent and identifiable cash flows. Based upon Linde's business model an asset group may be a single plant and related assets used to support on-site, merchant and packaged gas customers. Alternatively, the asset group may be a collection of distribution related assets (cylinders, distribution centers, and stores) or be a pipeline complex which includes multiple interdependent plants and related assets connected by pipelines within a geographic area used to support the same distribution methods.

Income Taxes

At December 31, 2021, Linde had deferred tax assets of $1,829 million (net of valuation allowances of $235 million), and deferred tax liabilities of $7,826 million. At December 31, 2021, uncertain tax positions totaled $387 million (see Note 1 and Note 5 to the consolidated financial statements). Income tax expense was $1,262 million for the year ended December 31, 2021, or about 24.7% of pre-tax income (see Note 5 to the consolidated financial statements for additional information related to taxes).

In the preparation of consolidated financial statements, Linde estimates income taxes based on diverse legislative and regulatory structures that exist in various jurisdictions where the company conducts business. Deferred income tax assets and liabilities represent tax benefits or obligations that arise from temporary differences due to differing treatment of certain items for accounting and income tax purposes. Linde evaluates deferred tax assets each period to ensure that estimated future taxable income will be sufficient in character (e.g. capital gain versus ordinary income treatment), amount and timing to result in their recovery. A valuation allowance is established when management determines that it is more likely than not that a deferred tax asset will not be realized to reduce the assets to their realizable value. Considerable judgments are required in establishing deferred tax valuation allowances and in assessing exposures related to tax matters. As events and circumstances change, related reserves and valuation allowances are adjusted to income at that time. Linde’s tax returns are subject to audit and local taxing authorities could challenge the company’s tax positions. The company’s practice is to review tax filing positions by jurisdiction and to record provisions for uncertain income tax positions, including interest and penalties when applicable. Linde believes it records and/or discloses such potential tax liabilities as appropriate and has reasonably estimated its income tax liabilities and recoverable tax assets. If new information becomes available, adjustments are charged or credited against income at that time. Management does not anticipate that such adjustments would have a material adverse effect on the company’s consolidated financial position or liquidity; however, it is possible that the final outcomes could have a material impact on the company’s reported results of operations.

Contingencies

The company accrues liabilities for non-income tax contingencies when management believes that a loss is probable and the amounts can be reasonably estimated, while contingent gains are recognized only when realized or realizable. If new information becomes available or losses are sustained in excess of recorded amounts, adjustments are charged against income at that time. Management does not anticipate that in the aggregate such losses would have a material adverse effect on the company's consolidated financial position or liquidity; however, it is possible that the final outcomes could have a material impact on the company's reported results of operations.

Linde is subject to various claims, legal proceedings and government investigations that arise from time to time in the ordinary course of business. These actions are based upon alleged environmental, tax, antitrust and personal injury claims, among others (see Note 17 to the consolidated financial statements). Such contingencies are significant and the accounting requires considerable management judgments in analyzing each matter to assess the likely outcome and the need for establishing appropriate liabilities and providing adequate disclosures. Linde believes it records and/or discloses such contingencies as appropriate and has reasonably estimated its liabilities.

NEW ACCOUNTING STANDARDS

See Note 1 to the consolidated financial statements for information concerning new accounting standards and the impact of the implementation of these standards on the company’s financial statements.

FAIR VALUE MEASUREMENTS

Linde does not expect changes in the aggregate fair value of its financial assets and liabilities to have a material impact on the consolidated financial statements. See Note 13 to the consolidated financial statements.

NON-GAAP FINANCIAL MEASURES

The following non-GAAP measures are intended to supplement investors' understanding of the company's financial information by providing measures which investors, financial analysts and management use to help evaluate the company's financial leverage and operating performance. Special items which the company does not believe to be indicative of on-going business performance are excluded from these calculations so that investors can better evaluate and analyze historical and future business trends on a consistent basis. Definitions of these non-GAAP measures may not be comparable to similar definitions used by other companies and are not a substitute for similar GAAP measures.

The non-GAAP measures in the following reconciliations are presented in this MD&A.

Adjusted Amounts

(Dollar amounts in millions, except per share data)		
Year Ended December 31,	**2021**	**2020**
Adjusted Operating Profit and Operating Margin		
Reported operating profit	$ 4,984	$ 3,322
Add: Cost reduction programs and other charges	273	506
Add: Purchase accounting impacts - Linde AG (c)	1,919	1,969
Total adjustments	2,192	2,475
Adjusted operating profit	$ 7,176	$ 5,797
Reported percentage change	50 %	
Adjusted percentage change	24 %	
Reported sales	$ 30,793	$ 27,243
Reported operating margin	16.2 %	12.2 %
Adjusted operating margin	23.3 %	21.3 %
Adjusted Depreciation and amortization		
Reported depreciation and amortization	$ 4,635	$ 4,626
Less: Purchase accounting impacts - Linde AG (c)	(1,863)	(1,920)
Adjusted depreciation and amortization	$ 2,772	$ 2,706
Adjusted Other Income (Expense) - net		
Reported Other Income (Expense) - net	$ (26)	$ (61)
Add: Purchase accounting impacts - Linde AG (c)	(56)	(49)
Adjusted Other Income (Expense) - net	$ 30	$ (12)
Adjusted Net Pension and OPEB Cost (Benefit), Excluding Service Cost		
Reported net pension and OPEB cost (benefit), excluding service cost	$ (192)	$ (177)
Add: Pension settlement charges	(4)	(6)
Adjusted Net Pension and OPEB cost (benefit), excluding service costs	$ (196)	$ (183)
Adjusted Interest Expense - Net		
Reported interest expense - net	$ 77	$ 115
Add: Purchase accounting impacts - Linde AG (c)	53	85
Less: Bond Redemption	—	(16)
Adjusted interest expense - net	$ 130	$ 184

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Adjusted Income Taxes (a)		
Reported income taxes	$ 1,262	$ 847
Add: Purchase accounting impacts - Linde AG (c)	452	399
Add: Pension settlement charges	1	1
Add: Cost reduction programs and other charges	29	130
Less: Bond Redemption	—	4
Total adjustments	482	534
Adjusted income taxes	$ 1,744	$ 1,381
Adjusted Effective Tax Rate (a)		
Reported income before income taxes and equity investments	$ 5,099	$ 3,384
Add: Pension settlement charge	4	6
Add: Purchase accounting impacts - Linde AG (c)	1,866	1,884
Add: Cost reduction programs and other charges	273	506
Less: Bond Redemption	—	16
Total adjustments	2,143	2,412
Adjusted income before income taxes and equity investments	$ 7,242	$ 5,796
Reported Income taxes	$ 1,262	$ 847
Reported effective tax rate	24.7 %	25.0 %
Adjusted income taxes	$ 1,744	$ 1,381
Adjusted effective tax rate	24.1 %	23.8 %
Income from Equity Investments		
Reported income from equity investments	$ 119	$ 85
Add: Cost reduction programs and other charges (d)	35	—
Add: Purchase accounting impacts - Linde AG (c)	77	57
Adjusted income from equity investments	$ 231	$ 142
Adjusted Noncontrolling Interests from Continuing Operations		
Reported noncontrolling interests from continuing operations	$ (135)	$ (125)
Add: Cost reduction programs and other charges	—	(4)
Add: Purchase accounting impacts - Linde AG (c)	(15)	(57)
Total adjustments	(15)	(61)
Adjusted noncontrolling interests from continuing operations	$ (150)	$ (186)
Adjusted Income from Continuing Operations (b)		
Reported income from continuing operations	$ 3,821	$ 2,497
Add: Pension settlement charge	3	5
Add: Cost reduction programs and other charges	279	372
Add: Purchase accounting impacts - Linde AG (c)	1,476	1,485
Less: Bond Redemption	—	12
Total adjustments	1,758	1,874
Adjusted income from continuing operations	$ 5,579	$ 4,371

Adjusted Diluted EPS from Continuing Operations (b)		
Reported diluted EPS from continuing operations	$ 7.32	$ 4.70
Add: Pension settlement charge	0.01	0.01
Add: Cost reduction programs and other charges	0.53	0.70
Less: Bond Redemption	—	0.02
Add: Purchase accounting impacts - Linde AG	2.83	2.80
Total adjustments	3.37	3.53
Adjusted diluted EPS from continuing operations	$ 10.69	$ 8.23
Reported percentage change	56 %	
Adjusted percentage change	30 %	
Adjusted EBITDA and % of Sales		
Income from continuing operations	$ 3,821	$ 2,497
Add: Noncontrolling interests related to continuing operations	135	125
Add: Net pension and OPEB cost (benefit), excluding service cost	(192)	(177)
Add: Interest expense	77	115
Add: Income taxes	1,262	847
Add: Depreciation and amortization	4,635	4,626
EBITDA from continuing operations	9,738	8,033
Add: Cost reduction programs and other charges	308	506
Add: Purchase accounting impacts - Linde AG	133	106
Total adjustments	441	612
Adjusted EBITDA from continuing operations	$ 10,179	$ 8,645
Reported sales	$ 30,793	$ 27,243
% of sales		
EBITDA from continuing operations	31.6 %	29.5 %
Adjusted EBITDA from continuing operations	33.1 %	31.7 %

(a) The income tax expense (benefit) on the non-GAAP pre-tax adjustments was determined using the applicable tax rates for the jurisdictions that were utilized in calculating the GAAP income tax expense (benefit) and included both current and deferred income tax amounts.

(b) Net of income taxes which are shown separately in “Adjusted Income Taxes and Effective Tax Rate”.

(c) The company believes that its non-GAAP measures excluding Purchase accounting impacts - Linde AG are useful to investors because: (i) the business combination was a merger of equals in an all-stock merger transaction, with no cash consideration, (ii) the company is managed on a geographic basis and the results of certain geographies are more heavily impacted by purchase accounting than others, causing results that are not comparable at the reportable segment level, therefore, the impacts of purchasing accounting adjustments to each segment vary and are not comparable within the company and when compared to other companies in similar regions, (iii) business management is evaluated and variable compensation is determined based on results excluding purchase accounting impacts, and; (iv) it is important to investors and analysts to understand the purchase accounting impacts to the financial statements.
A summary of each of the adjustments made for Purchase accounting impacts - Linde AG are as follows:
Adjusted Operating Profit and Margin: The purchase accounting adjustments for the periods presented relate primarily to depreciation and amortization related to the fair value step up of fixed assets and intangible assets (primarily customer related) acquired in the merger and the allocation of fair value step-up for ongoing Linde AG asset disposals (reflected in Other Income/(Expense)).
Adjusted Interest Expense - Net: Relates to the amortization of the fair value of debt acquired in the merger.
Adjusted Income Taxes and Effective Tax Rate: Relates to the current and deferred income tax impact on the adjustments discussed above. The income tax expense (benefit) on the non-GAAP pre-tax adjustments was determined using the applicable tax rates for the jurisdictions that were utilized in calculating the GAAP income tax expense (benefit) and included both current and deferred income tax amounts.
Adjusted Income from Equity Investments: Represents the amortization of increased fair value on equity investments related to depreciable and amortizable assets.
Adjusted Noncontrolling Interests from Continuing Operations: Represents the noncontrolling interests’ ownership portion of the adjustments described above determined on an entity by entity basis.

(d) Impairment charge related to a joint venture in the APAC segment

Net Debt and Adjusted Net Debt

Net debt is a financial liquidity measure used by investors, financial analysts and management to evaluate the ability of a company to repay its debt. Purchase accounting impacts have been excluded as they are non-cash and do not have an impact on liquidity.

	December 31, 2021	December 31, 2020
(Millions of dollars)		
Debt	$ 14,207	$ 16,154
Less: cash and cash equivalents	(2,823)	(3,754)
Net debt	11,384	12,400
Less: purchase accounting impacts - Linde AG	(61)	(121)
Adjusted net debt	$ 11,323	$ 12,279

SUPPLEMENTAL GUARANTEE INFORMATION

On June 6, 2020, the company filed a Form S-3 Registration Statement with the SEC (the "Registration Statement").

Linde plc may offer debt securities, preferred shares, depositary shares and ordinary shares under the Registration Statement, and debt securities exchangeable for or convertible into preferred shares, ordinary shares or other debt securities. Debt securities of Linde plc may be guaranteed by Linde Inc. (previously Praxair, Inc.) and/or Linde GmbH (previously Linde AG). Linde plc may provide guarantees of debt securities offered by its wholly owned subsidiaries Linde Inc. or Linde Finance under the Registration Statement.

Linde Inc. is a wholly owned subsidiary of Linde plc. Linde Inc. may offer debt securities under the Registration Statement. Debt securities of Linde Inc. will be guaranteed by Linde plc, and such guarantees by Linde plc may be guaranteed by Linde GmbH. Linde Inc. may also provide (i) guarantees of debt securities offered by Linde plc under the Registration Statement and (ii) guarantees of the guarantees provided by Linde plc of debt securities of Linde Finance offered under the Registration Statement.

Linde Finance B.V. is a wholly owned subsidiary of Linde plc. Linde Finance may offer debt securities under the Registration Statement. Linde plc will guarantee debt securities of Linde Finance offered under the Registration Statement. Linde GmbH and Linde Inc. may guarantee Linde plc’s obligations under its downstream guarantee.

Linde GmbH is a wholly owned subsidiary of Linde plc. Linde GmbH may provide (i) guarantees of debt securities offered by Linde plc under the Registration Statement and (ii) upstream guarantees of downstream guarantees provided by Linde plc of debt securities of Linde Inc. or Linde Finance offered under the Registration Statement.

In September 2019, Linde plc provided downstream guarantees of all of the pre-business combination Linde Inc. and Linde Finance notes, and Linde GmbH and Linde Inc., respectively, provided upstream guarantees of Linde plc’s downstream guarantees.

For further information about the guarantees of the debt securities registered under the Registration Statement (including the ranking of such guarantees, limitations on enforceability of such guarantees and the circumstances under which such guarantees may be released), see “Description of Debt Securities – Guarantees” and “Description of Debt Securities – Ranking” in the Registration Statement, which subsections are incorporated herein by reference.

The following tables present summarized financial information for Linde plc, Linde Inc., Linde GmbH and Linde Finance on a combined basis, after eliminating intercompany transactions and balances between them and excluding investments in and equity in earnings from non-guarantor subsidiaries.

(Millions of dollars)				
Statement of Income Data	**Twelve Months Ended December 31, 2021**		**Twelve Months Ended December 31, 2020**	
Sales	$	7,767	$	6,876
Operating profit		973		786
Net income		721		690
Transactions with non-guarantor subsidiaries		2,067		2,222
Balance Sheet Data (at period end)				
Current assets (a)	$	5,826	$	4,174
Long-term assets (b)		15,928		17,978
Current liabilities (c)		8,853		8,337
Long-term liabilities (d)		42,860		39,208
(a) From current assets above, amount due from non-guarantor subsidiaries	$	4,209	$	1,984
(b) From long-term assets above, amount due from non-guarantor subsidiaries		3,257		4,565
(c) From current liabilities above, amount due to non-guarantor subsidiaries		1,304		1,054
(d) From long-term liabilities above, amount due to non-guarantor subsidiaries		28,142		23,394

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Linde is exposed to market risks relating to fluctuations in interest rates and currency exchange rates. The objective of financial risk management at Linde is to minimize the negative impact of interest rate and foreign exchange rate fluctuations on the company’s earnings, cash flows and equity.

To manage these risks, Linde uses various derivative financial instruments, including interest-rate swaps, treasury rate locks, currency swaps, forward contracts, and commodity contracts. Linde only uses commonly traded and non-leveraged instruments. These contracts are entered into primarily with major banking institutions thereby minimizing the risk of credit loss. Also, see Note 1 and Note 12 to the consolidated financial statements for a more complete description of Linde’s accounting policies and use of such instruments.

The following discussion presents the sensitivity of the market value, earnings and cash flows of Linde’s financial instruments to hypothetical changes in interest and exchange rates assuming these changes occurred at December 31, 2021. The range of changes chosen for these discussions reflects Linde’s view of changes which are reasonably possible over a one-year period. Market values represent the present values of projected future cash flows based on interest rate and exchange rate assumptions.

Interest Rate Risk

At December 31, 2021, Linde had debt totaling $14,207 million ($16,154 million at December 31, 2020). For fixed-rate instruments, interest rate changes affect the fair market value but do not impact earnings or cash flows. Conversely, for floating-rate instruments, interest rate changes generally do not affect the fair market value of the instrument but impact future earnings and cash flows, assuming that other factors are held constant. At December 31, 2021, including the impact of derivatives, Linde had fixed-rate debt of $12,492 million and floating-rate debt of $1,715 million, representing 88% and 12%, respectively, of total debt. At December 31, 2020, Linde had fixed-rate debt of $10,365 million and floating-rate debt of $5,789 million, representing 64% and 36%, respectively, of total debt.

Fixed Rate Debt

In order to mitigate interest rate risk, when considered appropriate, interest-rate swaps are entered into as hedges of underlying financial instruments to effectively change the characteristics of the interest rate without actually changing the underlying financial instrument. At December 31, 2021, Linde had fixed-to-floating interest rate swaps outstanding that were designated as hedging instruments of the underlying debt issuances - refer to Note 12 to the consolidated financial statements for additional information. This sensitivity analysis assumes that, holding all other variables constant (such as foreign exchange rates, swaps and debt levels), a one hundred basis point increase in interest rates would decrease the unrealized fair market value of the fixed-rate debt portfolio by approximately $834 million ($674 million in 2020). A one hundred basis point increase in interest rates would result in an approximate $37 million decrease to derivative assets recorded.

Variable Rate Debt

At December 31, 2021, the after-tax earnings and cash flows impact of a one hundred basis point increase in interest rates, including offsetting impact of derivatives, on the variable-rate debt portfolio would be approximately $33 million ($44 million in 2020).

Foreign Currency Risk

Linde’s exchange-rate exposures result primarily from its investments and ongoing operations in Latin America (primarily Brazil and Mexico), Europe (primarily Germany, Scandinavia, and the U.K.), Canada, Asia Pacific (primarily Australia and China) and other business transactions such as the procurement of equipment from foreign sources. Linde frequently utilizes currency contracts to hedge these exposures. At December 31, 2021, Linde had a notional amount outstanding of $5,870 million ($7,553 million at December 31, 2020) related to foreign exchange contracts. The majority of these were to hedge recorded balance sheet exposures, primarily intercompany loans denominated in non-functional currencies. See Note 12 to the consolidated financial statements.

Holding all other variables constant, if there were a 10% increase in foreign-currency exchange rates for the portfolio, the fair market value of foreign-currency contracts outstanding at December 31, 2021 would decrease by approximately $28 million and at December 31, 2020 would decrease by approximately $99 million, which would be largely offset by an offsetting loss or gain on the foreign-currency fluctuation of the underlying exposure being hedged.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

MANAGEMENT'S STATEMENT OF RESPONSIBILITY FOR FINANCIAL STATEMENTS

Linde's consolidated financial statements are prepared by management, which is responsible for their fairness, integrity and objectivity. The accompanying financial statements have been prepared in conformity with accounting principles generally accepted in the United States of America applied on a consistent basis, except for accounting changes as disclosed, and include amounts that are estimates and judgments. All historical financial information in this annual report is consistent with the accompanying financial statements.

Linde maintains accounting systems, including internal accounting controls, monitored by a staff of internal auditors, that are designed to provide reasonable assurance of the reliability of financial records and the protection of assets. The concept of reasonable assurance is based on recognition that the cost of a system should not exceed the related benefits. The effectiveness of those systems depends primarily upon the careful selection of financial and other managers, clear delegation of authority and assignment of accountability, inculcation of high business ethics and conflict-of-interest standards, policies and procedures for coordinating the management of corporate resources, and the leadership and commitment of top management. In compliance with Section 404 of the Sarbanes-Oxley Act of 2002, Linde assessed its internal control over financial reporting and issued a report (see below).

The Audit Committee of the Board of Directors, which consists solely of non-employee directors, is responsible for overseeing the functioning of the accounting system and related controls and the preparation of annual financial statements. The Audit Committee periodically meets with management, internal auditors and the independent registered public accounting firm to review and evaluate their accounting, auditing and financial reporting activities and responsibilities, including management's assessment of internal control over financial reporting. The independent registered public accounting firm and internal auditors have full and free access to the Audit Committee and meet with the committee, with and without management present.

MANAGEMENT'S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING

Linde's management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Exchange Act Rule 13a-15(f). Under the supervision and with the participation of management, including the company's principal executive officer and principal financial officer, the company conducted an evaluation of the effectiveness of its internal control over financial reporting based on the framework in *Internal Control – Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (often referred to as COSO). Based on this evaluation, management concluded that the company's internal control over financial reporting was effective as of December 31, 2021.

PricewaterhouseCoopers LLP, an independent registered public accounting firm, has audited and issued their opinion on the effectiveness of the company's internal control over financial reporting as of December 31, 2021 as stated in their report.

/s/ STEPHEN F. ANGEL	/s/ KELCEY E. HOYT
Stephen F. Angel **Chief Executive Officer**	**Kelcey E. Hoyt** **Chief Accounting Officer**
/s/ MATTHEW J. WHITE	
Matthew J. White **Chief Financial Officer**	February 28, 2022

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Shareholders of Linde plc

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Linde plc and its subsidiaries (the "Company") as of December 31, 2021 and 2020, and the related consolidated statements of income, of comprehensive income, of equity and of cash flows for each of the three years in the period ended December 31, 2021, including the related notes (collectively referred to as the "consolidated financial statements"). We also have audited the Company's internal control over financial reporting as of December 31, 2021, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2021 and 2020, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2021 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2021, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the COSO.

Basis for Opinions

The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Report on Internal Control Over Financial Reporting. Our responsibility is to express opinions on the Company's consolidated financial statements and on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company’s assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Critical Audit Matters

The critical audit matter communicated below is a matter arising from the current period audit of the consolidated financial statements that was communicated or required to be communicated to the audit committee and that (i) relates to accounts or disclosures that are material to the consolidated financial statements and (ii) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing a separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

Revenue Recognition - Estimated Costs at Completion

As described in Note 19 to the consolidated financial statements, $2,867 million of the Company's total revenues for the year ended December 31, 2021 was generated from sale of equipment contracts. Sale of equipment contracts are generally comprised of a single performance obligation. Revenue from sale of equipment is generally recognized over time as the Company has an enforceable right to payment for performance completed to date and performance does not create an asset with alternative use. For contracts recognized over time, revenue is recognized primarily using a cost incurred input method. Costs incurred to date relative to total estimated costs at completion are used to measure progress toward satisfying performance obligations. Costs incurred include material, labor, and overhead costs and represent work contributing and proportionate to the transfer of control to the customer.

The principal considerations for our determination that performing procedures relating to revenue recognition - estimated costs at completion is a critical audit matter are (i) the significant judgment by management when developing the estimated costs at completion for sale of equipment contracts; (ii) a high degree of auditor judgment, subjectivity, and effort in performing procedures and evaluating audit evidence related to the estimated costs at completion and management's significant assumptions related to the total estimated material and labor costs; and (iii) the audit effort involved the use of professionals with specialized skill and knowledge.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to the revenue recognition process, including controls over developing the estimated costs at completion for sale of equipment contracts. These procedures also included, among others, evaluating and testing management's process for developing the estimated costs at completion for sale of equipment contracts, which included evaluating the reasonableness of management's significant assumptions related to the total estimated material and labor costs. Evaluating the reasonableness of management's significant assumptions involved evaluating management's ability to reasonably estimate costs at completion for sale of equipment contracts on a sample basis by (i) performing a comparison of the originally estimated and actual costs incurred on similar completed equipment contracts, and (ii) evaluating the timely identification of circumstances that may warrant a modification to estimated costs at completion, including actual costs in excess of estimates. Professionals with specialized skill and knowledge were used to assist in evaluating the reasonableness of management's estimates and significant assumptions related to the total estimated material and labor costs.

/s/ PricewaterhouseCoopers LLP
Stamford, Connecticut
February 28, 2022

We have served as the Company's or its predecessor's auditor since 1992.

CONSOLIDATED STATEMENTS OF INCOME
LINDE PLC AND SUBSIDIARIES
(Dollar amounts in millions, except per share data)

Year Ended December 31,	2021	2020	2019
Sales	$ 30,793	$ 27,243	$ 28,228
Cost of sales, exclusive of depreciation and amortization	17,543	15,383	16,644
Selling, general and administrative	3,189	3,193	3,457
Depreciation and amortization	4,635	4,626	4,675
Research and development	143	152	184
Cost reduction programs and other charges	273	506	567
Net gain on sale of businesses	—	—	164
Other income (expenses) – net	(26)	(61)	68
Operating Profit	4,984	3,322	2,933
Interest expense – net	77	115	38
Net pension and OPEB cost (benefit), excluding service cost	(192)	(177)	(32)
Income From Continuing Operations Before Income Taxes and Equity Investments	5,099	3,384	2,927
Income taxes on continuing operations	1,262	847	769
Income From Continuing Operations Before Equity Investments	3,837	2,537	2,158
Income from equity investments	119	85	114
Income From Continuing Operations (Including Noncontrolling Interests)	3,956	2,622	2,272
Income from discontinued operations, net of tax	5	4	109
Net Income (Including Noncontrolling Interests)	3,961	2,626	2,381
Less: noncontrolling interests from continuing operations	(135)	(125)	(89)
Less: noncontrolling interests from discontinued operations	—	—	(7)
Net Income – Linde plc	$ 3,826	$ 2,501	$ 2,285
Net Income – Linde plc			
Income from continuing operations	$ 3,821	$ 2,497	$ 2,183
Income from discontinued operations	$ 5	$ 4	$ 102
Per Share Data – Linde plc Shareholders			
Basic earnings per share from continuing operations	$ 7.39	$ 4.74	$ 4.03
Basic earnings per share from discontinued operations	0.01	0.01	0.19
Basic earnings per share	$ 7.40	$ 4.75	$ 4.22
Diluted earnings per share from continuing operations	$ 7.32	$ 4.70	$ 4.00
Diluted earnings per share from discontinued operations	0.01	0.01	0.19
Diluted earnings per share	$ 7.33	$ 4.71	$ 4.19
Weighted Average Shares Outstanding (000's):			
Basic shares outstanding	516,896	526,736	541,094
Diluted shares outstanding	521,875	531,157	545,170

The accompanying Notes are an integral part of these financial statements.

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME
LINDE PLC AND SUBSIDIARIES
(Dollar amounts in millions)

Year Ended December 31,	2021	2020	2019
NET INCOME (INCLUDING NONCONTROLLING INTERESTS)	$ 3,961	$ 2,626	$ 2,381
OTHER COMPREHENSIVE INCOME (LOSS)			
Translation adjustments:			
Foreign currency translation adjustments	(1,116)	565	118
Reclassifications to net income	(52)	—	12
Income taxes	(7)	30	3
Translation adjustments	(1,175)	595	133
Funded status - retirement obligations (Note 16):			
Retirement program remeasurements	826	(675)	(852)
Reclassifications to net income	175	92	154
Income taxes	(255)	114	154
Funded status - retirement obligations	746	(469)	(544)
Derivative instruments (Note 12):			
Current year unrealized gain (loss)	140	(3)	(32)
Reclassifications to net income	(49)	42	—
Income taxes	(20)	(8)	7
Derivative instruments	71	31	(25)
Securities:			
Current year unrealized gain (loss)	—	—	1
Reclassifications to net income	—	—	—
Income taxes	—	—	—
Securities	—	—	1
TOTAL OTHER COMPREHENSIVE INCOME (LOSS)	(358)	157	(435)
COMPREHENSIVE INCOME (INCLUDING NONCONTROLLING INTERESTS)	3,603	2,783	1,946
Less: noncontrolling interests	(135)	(158)	(19)
COMPREHENSIVE INCOME - LINDE PLC	$ 3,468	$ 2,625	$ 1,927

The accompanying Notes are an integral part of these financial statements.

CONSOLIDATED BALANCE SHEETS
LINDE PLC AND SUBSIDIARIES
(Dollar amounts in millions)

December 31,	2021	2020
Assets		
Cash and cash equivalents	$ 2,823	$ 3,754
Accounts receivable – net	4,499	4,167
Contract assets	134	162
Inventories	1,733	1,729
Prepaid and other current assets	970	1,112
Total Current Assets	10,159	10,924
Property, plant and equipment – net	26,003	28,711
Equity investments	2,619	2,061
Goodwill	27,038	28,201
Other intangible assets – net	13,802	16,184
Other long-term assets	1,984	2,148
Total Assets	$ 81,605	$ 88,229
Liabilities and Equity		
Accounts payable	$ 3,503	$ 3,095
Short-term debt	1,163	3,251
Current portion of long-term debt	1,709	751
Contract liabilities	2,940	1,769
Accrued taxes	429	542
Other current liabilities	3,899	4,332
Total Current Liabilities	13,643	13,740
Long-term debt	11,335	12,152
Other long-term liabilities	4,188	5,519
Deferred credits	6,998	7,236
Total Liabilities	36,164	38,647
Commitments and contingencies (Note 17)		
Redeemable noncontrolling interests	13	13
Linde plc Shareholders' Equity:		
Ordinary shares (€0.001 par value, authorized 1,750,000,000 shares, 2021 issued: 552,012,862 ordinary shares; 2020 issued: 552,012,862 ordinary shares)	1	1
Additional paid-in capital	40,180	40,202
Retained earnings	18,710	17,178
Accumulated other comprehensive income (loss)	(5,048)	(4,690)
Less: Treasury shares, at cost (2021 – 43,331,983 shares and 2020 – 28,718,333 shares)	(9,808)	(5,374)
Total Linde plc Shareholders' Equity	44,035	47,317
Noncontrolling interests	1,393	2,252
Total Equity	45,428	49,569
Total Liabilities and Equity	$ 81,605	$ 88,229

The accompanying Notes are an integral part of these financial statements.

CONSOLIDATED STATEMENTS OF CASH FLOWS
LINDE PLC AND SUBSIDIARIES

(Millions of dollars)

Year Ended December 31,	2021	2020	2019
Increase (Decrease) in Cash and Cash Equivalents			
Operations			
Net income – Linde plc	$ 3,826	$ 2,501	$ 2,285
Less: income from discontinued operations, net of tax and noncontrolling interests	(5)	(4)	(102)
Add: Noncontrolling interests from continuing operations	135	125	89
Income from continuing operations (including noncontrolling interests)	$ 3,956	$ 2,622	$ 2,272
Adjustments to reconcile net income to net cash provided by operating activities:			
Cost Reduction Programs and other charges, net of payments	98	258	(236)
Amortization of merger-related inventory step-up	—	—	12
Depreciation and amortization	4,635	4,626	4,675
Deferred income taxes	(254)	(369)	(303)
Share-based compensation	128	133	95
Net gain on sale of businesses, net of tax	—	—	(108)
Non-cash charges and other	(19)	152	(127)
Working capital			
Accounts receivable	(553)	19	80
Contract assets and liabilities, net	1,307	90	87
Inventory	(129)	18	(81)
Prepaid and other current assets	76	128	(72)
Payables and accruals	447	109	(174)
Pension contributions	(42)	(91)	(94)
Long-term assets, liabilities and other	75	(266)	93
Net cash provided by operating activities	9,725	7,429	6,119
Investing			
Capital expenditures	(3,086)	(3,400)	(3,682)
Acquisitions, net of cash acquired	(88)	(68)	(225)
Divestitures and asset sales, net of cash divested	167	482	5,096
Net cash provided by (used for) investing activities	(3,007)	(2,986)	1,189
Financing			
Short-term debt borrowings (repayments) – net	(1,329)	1,198	224
Long-term debt borrowings	2,283	2,796	99
Long-term debt repayments	(1,468)	(2,681)	(1,583)
Issuances of ordinary shares	50	47	72
Purchases of ordinary shares	(4,612)	(2,457)	(2,658)
Cash dividends – Linde plc shareholders	(2,189)	(2,028)	(1,891)
Noncontrolling interest transactions and other	(323)	(220)	(3,260)
Net cash used for financing activities	(7,588)	(3,345)	(8,997)
Discontinued Operations			
Cash provided by operating activities	$ —	$ —	$ 69
Cash used for investing activities	—	—	(60)
Cash provided by financing activities	—	—	5
Net cash provided by discontinued operations	—	—	14
Effect of exchange rate changes on cash and cash equivalents	(61)	(44)	(77)
Change in cash and cash equivalents	(931)	1,054	(1,752)
Cash and cash equivalents, beginning-of-period	3,754	2,700	4,466
Cash and cash equivalents, including discontinued operations	$ 2,823	$ 3,754	$ 2,714
Cash and cash equivalents of discontinued operations	—	—	(14)
Cash and cash equivalents, end-of-period	$ 2,823	$ 3,754	$ 2,700

Supplemental Data

Income taxes paid	$	1,710	$	1,066	$	1,357
Interest paid, net of capitalized interest (Note 7)	$	233	$	322	$	275

The accompanying Notes are an integral part of these financial statements.

CONSOLIDATED STATEMENTS OF EQUITY
LINDE PLC AND SUBSIDIARIES

(Dollar amounts in millions, except per share data, shares in

	Linde plc Shareholders' Equity									
	Ordinary shares					Treasury Stock				
Activity	Shares	Amounts	Additional Paid-in Capital	Retained Earnings	Accumulated Other Comprehensive Income (Loss) (Note 7)	Shares	Amounts	Linde plc Shareholders' Equity	Noncontrolling Interests	Total Equity
Balance, December 31, 2018	551,310	$ 1	$40,151	$ 16,529	$ (4,456)	4,069	$ (629)	$ 51,596	$ 5,484	$ 57,080
Net Income available for Linde plc shareholders				2,285				2,285	94	2,379
Other comprehensive income (loss)					(358)			(358)	(77)	(435)
Noncontrolling interests:										
Dividends and other capital reductions								—	(132)	(132)
Additions (Reductions) - (Note 14)								—	(2,921)	(2,921)
Redemption value adjustments				(8)				(8)		(8)
Dividends ($3.50 per ordinary share)				(1,891)				(1,891)		(1,891)
Issuances of common stock:										
For employee savings and incentive plans	703		(45)	(73)		(770)	127	9		9
Purchases of common stock						14,333	(2,654)	(2,654)		(2,654)
Share-based compensation			95					95		95
Balance, December 31, 2019	552,013	1	40,201	16,842	(4,814)	17,632	(3,156)	49,074	2,448	51,522
Net Income available for Linde plc shareholders				2,501				2,501	125	2,626
Other comprehensive income (loss)					124			124	33	157
Noncontrolling interests:										
Dividends and other capital reductions								—	(161)	(161)
Additions (Reductions) - (Note 14)								—	(193)	(193)
Redemption value adjustments				17				17		17
Dividends ($3.852 per ordinary share)				(2,028)				(2,028)		(2,028)
Issuances of ordinary shares:										
For employee savings and incentive plans			(132)	(154)		(1,208)	233	(53)		(53)
Purchases of ordinary shares						12,294	(2,451)	(2,451)		(2,451)
Share-based compensation			133					133		133
Balance, December 31, 2020	552,013	$ 1	$40,202	$ 17,178	$ (4,690)	28,718	$(5,374)	$ 47,317	$ 2,252	$ 49,569
Net Income available for Linde plc shareholders				3,826				$ 3,826	135	$ 3,961
Other comprehensive income (loss)					(358)			(358)	—	(358)
Noncontrolling interests:										
Dividends and other capital reductions								—	(118)	(118)
Additions (Reductions) - (Note 14)								—	(876)	(876)
Dividends ($4.24 per ordinary share)				(2,189)				(2,189)		(2,189)
Issuances of ordinary shares:										
For employee savings and incentive plans			(150)	(105)		(1,026)	209	(46)		(46)
Purchases of ordinary shares						15,640	(4,643)	(4,643)		(4,643)
Share-based compensation			128					128		128
Balance, December 31, 2021	552,013	$ 1	$40,180	$ 18,710	$ (5,048)	43,332	$(9,808)	$ 44,035	$ 1,393	$ 45,428

thousands)

The accompanying Notes are an integral part of these financial statements

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
LINDE PLC AND SUBSIDIARIES

NOTE 1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Linde plc ("Linde" or "the company") is an incorporated public limited company formed under the laws of Ireland. Linde's registered office is located at Ten Earlsfort Terrace, Dublin 2, D02 T380 Ireland. Linde's principal executive offices are located at The Priestley Centre, 10 Priestley Road, Surrey Research Park, Guildford, Surrey GU2 7XY, United Kingdom and 10 Riverview Drive, Danbury, Connecticut, United States. Linde trades on the New York Stock Exchange and on the Frankfurt Stock Exchange under the symbol LIN.

Principles of Consolidation – The consolidated financial statements were prepared in conformity with accounting principles generally accepted in the United States of America (" U.S. GAAP") and include the accounts of all significant subsidiaries where control exists and, in limited situations, variable-interest entities where the company is the primary beneficiary. Intercompany transactions and balances are eliminated in consolidation and any significant related-party transactions have been disclosed.

Equity investments generally consist of 20% to 50% owned operations where the company exercises significant influence, but does not have control. Income from equity investments in corporations is reported on an after-tax basis. Pre-tax income from equity investments that are partnerships or limited-liability corporations is included in other income (expenses) – net with related taxes included in Income taxes. Equity investments are reviewed for impairment whenever events or circumstances reflect that an impairment loss may have been incurred.

Changes in ownership interest that result either in consolidation or deconsolidation of an investment are recorded at fair value through earnings, including the retained ownership interest, while changes that do not result in either consolidation or deconsolidation of a subsidiary are treated as equity transactions.

Use of Estimates – The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. While actual results could differ, management believes such estimates to be reasonable.

Operations – Linde is the largest industrial gases company globally. The company produces, sells and distributes atmospheric, process and specialty gases to a diverse group of industries including aerospace, chemicals, food and beverage, electronics, energy, healthcare, manufacturing, and metals. Linde's Engineering business offers its customers an extensive range of gas production and processing services including supplying plant components and services directly to customers.

Revenue Recognition – Revenue is recognized as control of goods or services are transferred to customers in an amount that reflects the consideration to which an entity expects to be entitled to receive in exchange for the goods or services. See Note 19 for additional details regarding Linde's revenue recognition policies.

Cash Equivalents – Cash equivalents are considered to be highly liquid securities with original maturities of three months or less.

Inventories – Inventories are stated at the lower of cost or net realizable value. Cost is determined using the average-cost method.

Property, Plant and Equipment – Net – Property, plant and equipment are carried at cost, net of accumulated depreciation. The company capitalizes labor, applicable overhead and interest as part of the cost of constructing major facilities. Expenditures for additions and improvements that extend the lives or increase the capacity of plant assets are also capitalized. Depreciation is calculated on the straight-line method based on the estimated useful lives of the assets, which range from 3 years to 40 years (see Note 8). Linde uses accelerated depreciation methods for tax purposes where appropriate. Maintenance of property, plant and equipment is generally expensed as incurred.

The company performs a test for impairment whenever events or changes in circumstances indicate that the carrying amount of an individual asset or asset group may not be recoverable. Should projected undiscounted future cash flows be less than the carrying amount of the asset or asset group, an impairment charge reducing the carrying amount to fair value is required. Fair value is determined based on the most appropriate valuation technique, including discounted cash flows.

Asset-Retirement Obligations – An asset-retirement obligation is recognized in the period in which sufficient information exists to determine the fair value of the liability with a corresponding increase to the carrying amount of the related property, plant and equipment which is then depreciated over its useful life. The liability is initially measured at fair value and then accretion expense is recorded in each subsequent period. The company’s asset-retirement obligations are primarily associated with its on-site long-term supply arrangements where the company has built a facility on land leased from the customer and is obligated to remove the facility at the end of the contract term. The company's asset-retirement obligations are not material to its consolidated financial statements.

Foreign Currency Translation – For most foreign operations, the local currency is the functional currency and translation gains and losses are reported as part of the accumulated other comprehensive income (loss) component of equity as a cumulative translation adjustment (see Note 7).

Financial Instruments – Linde enters into various derivative financial instruments to manage its exposure to fluctuating interest rates, currency exchange rates, commodity pricing and energy costs. Such instruments primarily include interest-rate swap and treasury rate lock agreements; currency-swap agreements; forward contracts; currency options; and commodity-swap agreements. These instruments are not entered into for trading purposes. Linde only uses commonly traded and non-leveraged instruments.

There are three types of derivatives the company enters into: (i) those relating to fair-value exposures, (ii) those relating to cash-flow exposures, and (iii) those relating to foreign currency net investment exposures. Fair-value exposures relate to recognized assets or liabilities, and firm commitments; cash-flow exposures relate to the variability of future cash flows associated with recognized assets or liabilities, or forecasted transactions; and net investment exposures relate to the impact of foreign currency exchange rate changes on the carrying value of net assets denominated in foreign currencies.

When a derivative is executed and hedge accounting is appropriate, it is designated as either a fair-value hedge, cash-flow hedge, or a net investment hedge. Currently, Linde designates all interest-rate and treasury rate locks as hedges for accounting purposes; however, currency contracts are generally not designated as hedges for accounting purposes unless they are related to forecasted transactions. Whether designated as hedges for accounting purposes or not, all derivatives are linked to an appropriate underlying exposure. On an ongoing basis, the company assesses the hedge effectiveness of all derivatives designated as hedges for accounting purposes to determine if they continue to be highly effective in offsetting changes in fair values or cash flows of the underlying hedged items. If it is determined that the hedge is not highly effective, then hedge accounting will be discontinued prospectively.

Changes in the fair value of derivatives designated as fair-value hedges are recognized in earnings as an offset to the change in the fair values of the underlying exposures being hedged. The changes in fair value of derivatives that are designated as cash-flow hedges are deferred in accumulated other comprehensive income (loss) and are reclassified to earnings as the underlying hedged transaction affects earnings. Provided the hedge remains highly effective, any ineffectiveness is deferred in accumulated other comprehensive income (loss) and are reclassified to earnings as the underlying hedged transaction affects earnings. Hedges of net investments in foreign subsidiaries are recognized in the cumulative translation adjustment component of accumulated other comprehensive income (loss) on the consolidated balance sheets to offset translation gains and losses associated with the hedged net investment. Derivatives that are entered into for risk-management purposes and are not designated as hedges (primarily related to currency derivatives other than for firm commitments) are recorded at their fair market values and recognized in current earnings.

See Note 12 for additional information relating to financial instruments.

Goodwill – Acquisitions are accounted for using the acquisition method which requires allocation of the purchase price to assets acquired and liabilities assumed based on estimated fair values. Any excess of the purchase price over the fair value of the assets and liabilities acquired is recorded as goodwill. Allocations of the purchase price are based on preliminary estimates and assumptions at the date of acquisition and are subject to revision based on final information received, including appraisals and other analyses which support underlying estimates.

The company performs a goodwill impairment test annually, during the fourth quarter, or more frequently if events or circumstances indicate that an impairment loss may have been incurred. The impairment test allows an entity to first assess qualitative factors to determine if it is more likely than not that the fair value of a reporting unit is less than carrying value. If it is determined that it is more likely than not that the fair value of a reporting unit is less than carrying value then the company will estimate and compare the fair value of its reporting units to their carrying value, including goodwill. Reporting units are determined based on one level below the operating segment level. The qualitative analysis of goodwill for the year ended December 31, 2021 showed the fair value of the reporting units substantially exceeded the carrying value, as such further analysis was not performed.

See Note 9 for additional information relating to goodwill.

Other Intangible Assets – Other intangible assets, primarily customer relationships, are amortized over the estimated period of benefit. The determination of the estimated period of benefit will be dependent upon the use and underlying characteristics of the intangible asset. Linde evaluates the recoverability of its intangible assets subject to amortization when facts and circumstances indicate that the carrying value of the asset may not be recoverable. If the carrying value is not recoverable, impairment is measured as the amount by which the carrying value exceeds its estimated fair value. Fair value is generally estimated based on either appraised value or other valuation techniques. Indefinite lived intangible assets related to the Linde brand are evaluated for impairment on an annual basis or more frequently if events or circumstances indicate an impairment loss may have occurred.

See Note 10 for additional information relating to other intangible assets.

Assets Held for Sale and Discontinued Operations – Assets held for sale, as well as liabilities directly related to these assets, are classified separately in the consolidated balance sheets as held for sale if the requirements of the FASB's Accounting Standards Codification ("ASC") 360, *Property, Plant and Equipment*, are satisfied. The main requirements of ASC 360 are: (i) management having the authority to approve the action has committed to a plan to sell the assets and an active program to locate a buyer has been initiated, (ii) the assets are available for sale in their present condition at a reasonable market price, and (iii) a sale within the next twelve months is probable. Assets classified as held for sale are measured at the lower of carrying amount and fair value less costs to sell. Amortization and depreciation has been discontinued. The process involved in determining the fair value less costs to sell involves estimates and assumptions that are subject to uncertainty.

Discontinued operations are reported as soon as a business is classified as held for sale, or has already been disposed of, and when the business to be disposed of represents a strategic shift that has (or will have) a major effect on the company's operations and financial results. Businesses acquired with the intent of divesting are also required to be reported as discontinued operations. The profit/loss from discontinued operations is reported separately from the expenses and income from continuing operations in the consolidated statements of income. In the consolidated statement of cash flows, the cash flows from discontinued operations are shown separately from the cash flows from continuing operations. The information provided in the Notes relates to continuing operations. If the information relates exclusively to discontinued operations, this is highlighted accordingly.

Income Taxes – Deferred income taxes are recorded for the temporary differences between the financial statement and tax bases of assets and liabilities using currently enacted tax rates. Valuation allowances are established against deferred tax assets whenever circumstances indicate that it is more likely than not that such assets will not be realized in future periods.

Under the guidance for accounting for uncertainty in income taxes, the company can recognize the benefit of an income tax position only if it is more likely than not (greater than 50%) that the tax position will be sustained upon tax examination, based solely on the technical merits of the tax position. Otherwise, no benefit can be recognized. The tax benefits recognized are measured based on the largest benefit that has a greater than 50% likelihood of being realized upon ultimate settlement. Additionally, the company accrues interest and related penalties, if applicable, on all tax exposures for which reserves have been established consistent with jurisdictional tax laws. Interest and penalties are classified as income tax expense in the financial statements.

See Note 5 for additional information relating to income taxes.

Retirement Benefits – Most Linde employees participate in a form of defined benefit or contribution retirement plan, and additionally certain employees are eligible to participate in various post-employment health care and life insurance benefit plans. The cost of contribution plans is recognized in the year earned while the cost of other plans is recognized over the employees' expected service period to the company, all in accordance with the applicable accounting standards. The funded status of the plans is recorded as an asset or liability in the consolidated balance sheets. Funding of retirement benefits varies and is in accordance with local laws and practices.

See Note 16 for additional information relating to retirement programs.

Share-based Compensation– The company has historically granted share-based awards which consist of stock options, restricted stock and performance-based stock. Share-based compensation expense is generally recognized on a straight-line basis over the stated vesting period. For stock awards granted to full-retirement-eligible employees, compensation expense is recognized over the period from the grant date to the date retirement eligibility is achieved. For performance-based awards, compensation expense is recognized only if it is probable that the performance condition will be achieved.

See Note 15 for additional disclosures relating to share-based compensation.

Reclassifications – Certain prior years' amounts have been reclassified to conform to the current year's presentation.

Recently Issued Accounting Standards

Accounting Standards Implemented in 2021

- **Income Taxes - Simplifying the Accounting for Income Taxes** - In December 2019, the FASB issued guidance which simplifies the accounting for income taxes by removing several exceptions in the current standard and adds guidance to reduce complexity in certain areas, such as requiring that an entity reflect the effect of an enacted change in tax laws or rates in the annual effective tax rate computation in the interim period that includes the enactment date, evaluating whether a step-up in tax basis of goodwill relates to a business combination or a separate transaction and allocating taxes to members of a consolidated group. The new standard is effective for fiscal years, and interim periods within those fiscal years, beginning after December 15, 2020, with early adoption permitted. The adoption of this standard did not materially impact the company's consolidated financial statements.

- **Reference Rate Reform** - In March 2020 with amendments in 2021, the FASB issued guidance related to reference rate reform which provides practical expedients and exceptions for applying U.S. GAAP to contract modifications, hedging relationships and other transactions that the reference London Interbank Offered Rate ("LIBOR") and other interbank offered rates. This update is applicable to our contracts and hedging relationships that reference LIBOR and other interbank offered rates. The amendments may be applied to impacted contracts and hedges prospectively through December 31, 2022. The application of this guidance did not materially impact the company's consolidated financial statements.

NOTE 2. Business Combination and Divestitures

Merger of Praxair, Inc. and Linde AG

On October 31, 2018 Praxair and Linde AG combined their respective businesses through an all-stock transaction and became subsidiaries of the company.

Linde AG Merger-Related Divestitures - Primarily Americas Industrial Gases Business

As a condition of the U.S. regulatory approval of the merger, Linde AG agreed to sell the majority of its industrial gases business in the Americas, as described below:

- The Linde AG Americas Sales and Purchase Agreement, dated July 16, 2018, as and further amended on September 22, 2018, October 19, 2018, and February 20, 2019 whereby Linde AG and Praxair, Inc. entered into an agreement with a consortium comprising companies of the German industrial gases manufacturer Messer Group and CVC Capital Partners Fund VII to sell the majority of Linde AG's industrial gases business in North America and certain industrial gases business activities of Linde AG's in South America for $2.9 billion in cash consideration after purchase price adjustments for certain items relating to assets and liabilities of the sold businesses. In addition, divestitures include $0.5 billion of proceeds for incremental plant sales within the Americas under other agreements. These transactions were completed on March 1, 2019.

- On April 30, 2019, Linde completed the sale of select assets of Linde South Korea with the sale price of $1.2 billion to IMM Private Equity Inc., to satisfy requirements of the Korea Fair Trade Commission. The assets divested include bulk and on-site business in Giheung, Pohang and Seosan sites as well as oxygen and nitrogen on-site generators.

- On December 16, 2019, Linde completed the sale of select assets of Linde India with a sale price of $193 million.
- In March 2020, Linde completed the sale of select assets of Linde China with a sale price of $98 million.

Discontinued Operations
Only the sales of the Linde AG merger-related divestitures meet the criteria for discontinued operations, Praxair merger-related divestitures do not qualify as discontinued operations. As such, operations related to the Linde AG merger-related divestitures are included within Income from discontinued operations, net of tax for periods subsequent to the merger, as summarized below:

Millions of dollars	2021	2020	2019
Net sales	$ 5	$ 7	$ 449
Cost of sales	1	3	251
Other operating costs	1	1	43
Operating profit	$ 3	$ 3	$ 155
Income from equity investments	2	1	8
Income taxes	—	—	54
Income from discontinued operations, net of tax	$ 5	$ 4	$ 109
Noncontrolling interests	—	—	(7)
Income from continuing operations, net of tax and noncontrolling interests	$ 5	$ 4	$ 102

For the years ended December 31, 2021, 2020 and 2019 there were no material amounts of capital expenditures or significant operating or investing non-cash items related to discontinued operations.

Non-Merger Related Acquisitions
Non-merger related acquisitions of $88 million, $68 million and $225 million for the years ended December 31, 2021, 2020 and 2019, respectively, were primarily related to the Americas and are not material, individually or in the aggregate.

Non-Merger Related Divestitures

Effective January 1, 2021, Linde deconsolidated a joint venture with operations in APAC, due to the expiration of certain contractual rights that the parties mutually agreed not to renew. From the effective date, the joint venture is reflected as an equity investment on Linde's consolidated balance sheet with the corresponding results reflected in income from equity investments on the consolidated statement of income.

The fair value of the joint venture at January 1, 2021 was determined using a discounted cash flow model and approximated the carrying amount of its net assets. The net carrying value of $852 million was mainly comprised of assets of approximately $1.9 billion (primarily Other intangibles and Property plant and equipment - net), net of liabilities of approximately $1.0 billion. Upon deconsolidation an equity investment was recorded representing Linde's share of the joint venture's net assets. The deconsolidation resulted in a gain of $52 million recorded within cost reduction programs and other charges (see Note 3) related to the release of the CTA balance recorded within AOCI. The company did not receive any consideration, cash or otherwise, as part of the deconsolidation.

The joint venture contributed sales of approximately $600 million in 2020. Future earnings per share will not be affected as the ownership percent remains the same.

NOTE 3. COST REDUCTION PROGRAMS AND OTHER CHARGES

Cost reduction programs and other charges were $273 million, $506 million, and $567 million for the 12 months ended December 31, 2021, 2020, and 2019, respectively. After tax and noncontrolling interests, charges were $279 million, $372 million, and $444 million for the same respective periods.

The following tables provide a summary of the pre-tax charges by reportable segment for the years ended December 31, 2021, 2020, and 2019:

(millions of dollars)	Year Ended December 31, 2021 Severance costs	Other cost reduction charges	**Total cost reduction program related charges**	Merger related and other charges	**Total**
Americas	$ 4	$ 2	6	(6)	$ —
EMEA	204	33	237	1	238
APAC	16	12	28	(50)	(22)
Engineering	20	6	26	—	26
Other	15	26	41	(10)	31
Total	$ 259	$ 79	$ 338	$ (65)	$ 273

(millions of dollars)	Year Ended December 31, 2020 Severance costs	Other cost reduction charges	**Total cost reduction program related charges**	Merger related and other charges	**Total**
Americas	$ 35	$ 24	59	13	$ 72
EMEA	131	21	152	3	155
APAC	7	2	9	3	12
Engineering	38	28	66	4	70
Other	87	18	105	92	197
Total	$ 298	$ 93	$ 391	$ 115	$ 506

(millions of dollars)	Year Ended December 31, 2019 Severance costs	Other cost reduction charges	**Total cost reduction program related charges**	Merger related and other charges	**Total**
Americas	$ 36	$ 20	56	34	$ 90
EMEA	105	16	121	21	142
APAC	40	10	50	72	122
Engineering	1	12	13	(9)	4
Other	22	42	64	145	209
Total	$ 204	$ 100	$ 304	$ 263	$ 567

Cost Reduction Programs

In 2019, Linde initiated a cost reduction program, which represents charges of achieving synergies and cost efficiencies expected from the merger of Praxair and Linde AG (see Note 2). Total charges related to the cost reduction programs were $338 million ($253 million, after tax), $391 million ($277 million, after tax and noncontrolling interests), and $304 million ($233 million, after tax) for the years ended December 31, 2021, 2020, and 2019, respectively.

Severance costs

During the year ended December 31, 2021, severance costs of $259 million were recorded for the elimination of approximately 2,000 positions. Severance costs of $298 million and $204 million for the years ended December 31, 2020 and December 31, 2019 were recorded for the elimination of approximately 3,100 and 2,400 positions, respectively. As of December 31, 2021, the majority of the actions have been taken, with the remaining actions planned to be completed within the next 12 months.

Other cost reduction charges

Other cost reduction charges were $79 million, $93 million, and $100 million for the years ended December 31, 2021, 2020, and 2019, respectively. These amounts primarily represent charges related to the execution of the company's synergistic actions including location consolidations and business rationalization projects, software and process harmonization, and associated non-recurring costs.

Merger-Related Costs and Other Charges

Merger-related costs and other charges were a benefit of $65 million ($26 million, after tax) and charges of $115 million ($95 million, after tax) and $263 million ($211 million, after tax and noncontrolling interests) for the years ended December 31, 2021, 2020, and 2019, respectively. The 2021 pretax benefit was primarily due to a $52 million gain triggered by a joint venture deconsolidation in the APAC segment in the first quarter (see Note 2). After-tax charges also include the impact of the below items.

2021 after-tax charges include a net income tax charge of $56 million, primarily related to (i) $83 million of expense due to the revaluation of a net deferred tax liability resulting from a tax rate increase in the United Kingdom which was enacted in the second quarter, and (ii) a tax settlement benefit of $33 million. 2021 also includes an impairment charge of $35 million ($35 million, after tax) related to a joint venture in the APAC segment. The charge is shown within income from equity investments in the consolidated statements of income.

2019 includes other charges for an asset impairment related to a joint venture in APAC of approximately $73 million ($42 million, after tax and noncontrolling interests) resulting from an unfavorable arbitration ruling.

Cash Requirements

Total cash requirements of the cost reduction program and other charges incurred during the twelve months ended December 31, 2021 are estimated to be approximately $259 million, of which $175 million was paid through December 31, 2021. Remaining cash requirements are expected to be paid through 2023. Total cost reduction programs and other charges, net of payments in the consolidated statements of cash flows for the twelve months ended December 31, 2021 and 2020 also reflect the impact of cash payments of liabilities, including merger-related tax liabilities, accrued as of December 31, 2020 and 2019, respectively.

The following table summarizes the activities related to the company's cost reduction programs and other charges during 2020 and 2021:

(millions of dollars)	Severance costs	Other cost reduction charges	**Total cost reduction program related charges**	Merger related and other charges	**Total**
Balance, December 31, 2019	$ 117	$ 16	$ 133	$ 67	$ 200
2020 Cost Reduction Programs and Other Charges	298	93	391	115	506
Less: Cash payments	(156)	(20)	(176)	(45)	(221)
Less: Non-cash charges	—	(68)	(68)	(82)	(150)
Foreign currency translation and other	24	1	25	9	34
Balance, December 31, 2020	$ 283	$ 22	$ 305	$ 64	$ 369
2021 Cost Reduction Programs and Other Charges	259	79	338	(65)	273
Less: Cash payments	(138)	(15)	(153)	(22)	(175)
Less: Non-cash charges	—	(41)	(41)	54	13
Foreign currency translation and other	(20)	(7)	(27)	—	(27)
Balance, December 31, 2021	$ 384	$ 38	$ 422	$ 31	$ 453

Classification in the consolidated financial statements

The pre-tax charges for each year are shown within operating profit in a separate line item on the consolidated statements of income. In the consolidated balance sheets, reductions in assets are recorded against the carrying value of the related assets and unpaid amounts are recorded as other current or long-term liabilities (see Note 7). On the consolidated statements of cash flows, the pre-tax impact of these charges, net of cash payments, is shown as an adjustment to reconcile net income to net cash provided by operating activities. In Note 18 Segment Information, Linde excluded these charges from its management definition of segment operating profit; a reconciliation of segment operating profit to consolidated operating profit is shown within the segment operating profit table.

NOTE 4. LEASES

In the normal course of its business, Linde enters into various leases as the lessee, primarily involving manufacturing and distribution equipment and office space. Linde determines whether a contract is or contains a lease at contract inception. Total lease and rental expenses related to operating lease right of use assets for the twelve months ended December 31, 2021 and 2020 was $317 million, and $341 million respectively. Operating leases costs are included in selling, general and administrative expenses and cost of sales, exclusive of depreciation and amortization. The related assets and obligations are included in other long term assets and other current liabilities and other long term liabilities, respectively. Total lease and rental expenses related to finance lease right of use assets for the twelve months ended December 31, 2021 and 2020 was $51 million and $44 million, respectively, and the costs are included in depreciation and amortization and interest. Related assets and obligations are included in other long term assets and other current liabilities and other long term liabilities, respectively**.** Linde includes renewal options that are reasonably certain to be exercised as part of the lease term. Operating and financing lease expenses above include short term and variable lease costs which are immaterial.

As most leases do not provide an implicit rate, Linde uses the applicable incremental borrowing rate at lease commencement to measure lease liabilities and right-of-use assets. Linde determines incremental borrowing rates through market sources.

The company has elected to apply the short-term lease exception for all underlying asset classes. Short-term leases are leases that, at the commencement date, have a lease term of twelve months or less and do not include a purchase option that the lessee is reasonably certain to exercise. Leases that meet the short-term lease definition are not recognized on the balance sheet, but rather expensed on a straight-line basis over the lease term.

Some leasing arrangements require variable payments that are dependent on usage, output, or may vary for other reasons, such as insurance. The company does not have material variable lease payments.

Gains and losses on sale and leaseback transactions were immaterial. Operating cash flows used for operating leases for the twelve months ended December 31, 2021 and 2020 were $290 million and $317 million, respectively. Cash flows used for finance leases for the same period were immaterial.

Supplemental balance sheet information related to leases is as follows:

(Millions of dollars)	**December 31, 2021**	**December 31, 2020**
Operating Leases		
Operating lease right-of-use assets	$ 853	$ 935
Other current liabilities	215	237
Other long-term liabilities	618	669
Total operating lease liabilities	833	906
Finance Leases		
Finance lease right-of-use assets	163	155
Other current liabilities	47	38
Other long-term liabilities	129	125
Total finance lease liabilities	$ 176	$ 163

Supplemental operating lease information:

	December 31, 2021	December 31, 2020
Weighted average lease term (years)	9	9
Weighted average discount rate	2.91 %	2.83 %

Future operating and finance lease payments as of December 31, 2021 are as follows (millions of dollars):

Period	Operating Leases	Financing Leases
2022	$ 227	$ 54
2023	162	40
2024	116	29
2025	84	20
2026	61	11
Thereafter	281	67
Total future undiscounted lease payments	931	221
Less imputed interest	(98)	(45)
Total reported lease liability	$ 833	$ 176

NOTE 5. INCOME TAXES

Pre-tax income applicable to U.S. and non-U.S. operations is as follows:

(Millions of dollars) **Year Ended December 31,**	**2021**	**2020**	**2019**
United States	$ 2,020	$ 1,253	$ 1,161
Non-U.S.	3,079	2,131	1,766
Total income before income taxes	$ 5,099	$ 3,384	$ 2,927

Provision for Income Taxes

The following is an analysis of the provision for income taxes:

(Millions of dollars) **Year Ended December 31,**	**2021**	**2020**	**2019(a)**
Current tax expense (benefit)			
U.S. federal	$ 287	$ 185	$ 64
State and local	87	17	39
Non-U.S.	1,142	1,013	969
	1,516	1,215	1,072
Deferred tax expense (benefit)			
U.S. federal	63	20	85
State and local	8	7	—
Non-U.S.	(325)	(395)	(388)
	(254)	(368)	(303)
Total income taxes	$ 1,262	$ 847	$ 769

(a) 2019 includes $70 million related to divestitures, non-U.S. current tax expense of $48 million and non-U.S. deferred tax expense of $22 million.

U.S. Tax Cuts and Jobs Act (Tax Act) 2018

As of December 31, 2021 and 2020, the tax payable related to the deemed repatriation tax is $178 million and $230 million, respectively, of which $178 million and $204 million is classified as other long-term liabilities on the consolidated balance sheet (See Note 7), respectively. The company is required to fund the balance in annual installments through 2025.

Effective Tax Rate Reconciliation

For purposes of the effective tax rate reconciliation, the company utilizes the U.S. statutory income tax rate of 21%. An analysis of the difference between the provision for income taxes and the amount computed by applying the U.S. statutory income tax rate to pre-tax income follows:

(Dollar amounts in millions) **Year Ended December 31,**	**2021**		**2020**		**2019**	
U.S. statutory income tax	$ 1,071	21.0 %	$ 711	21.0 %	$ 615	21.0 %
State and local taxes – net of federal benefit	83	1.6 %	21	0.6 %	31	1.1 %
U.S. tax credits and deductions (a)	(23)	(0.5)%	(8)	(0.2)%	(31)	(1.1)%
Non-U.S. tax differentials (b) (c)	219	4.3 %	167	4.9 %	113	3.9 %
Share-Based compensation	(56)	(1.1)%	(53)	(1.6)%	(41)	(1.4)%
Divestitures	—	— %	—	— %	36	1.2 %
Other – net (d)	(32)	(0.6)%	9	0.3 %	46	1.6 %
Provision for income taxes	$ 1,262	24.7 %	$ 847	25.0 %	$ 769	26.3 %

(a) U.S. tax credits and deductions relate to non-U.S. derived intangible income and the research and experimentation tax credit in 2021, 2020 and 2019.

(b) Primarily related to differences between the U.S. tax rate and the statutory tax rate in the countries where the company operates. Excluding (c), other permanent items and tax rate changes were not significant.

(c) 2021 includes an $83 million deferred income tax charge related to a tax rate increase in the United Kingdom.

(d) Other - net includes $8 million, $11 million and $26 million of U.S tax related to Global Intangible Low-Taxed Income in 2021, 2020 and 2019, respectively and a decrease in unrecognized tax benefits and accrued interest and penalties of $47 million in 2021.

Net Deferred Tax Liabilities

Net deferred tax liabilities included in the consolidated balance sheets are comprised of the following:

(Millions of dollars) **December 31,**	2021	2020
Deferred tax liabilities		
Fixed assets	$ 3,177	$ 3,430
Goodwill	166	173
Other intangible assets (a)	3,263	3,703
Subsidiary/equity investments	586	609
Other (b)	634	791
	$ 7,826	$ 8,706
Deferred tax assets		
Carryforwards	$ 358	$ 386
Benefit plans and related (c)	607	814
Inventory	57	70
Accruals and other (d)	1,042	1,243
	$ 2,064	$ 2,513
Less: Valuation allowances (e)	(235)	(243)
	$ 1,829	$ 2,270
Net deferred tax liabilities	$ 5,997	$ 6,436
Recorded in the consolidated balance sheets as (Note 7):		
Other long-term assets	242	268
Deferred credits	6,239	6,704
	$ 5,997	$ 6,436

(a) Excludes $230 million of Intangibles in 2021 due to the effects of the deconsolidation of a joint venture with operations in APAC (See Note 2).

(b) Includes $236 million in 2021 and $255 million in 2020 related to right-of-use lease assets.

(c) Includes deferred taxes of $305 million and $560 million in 2021 and 2020, respectively, related to pension / OPEB funded status (See Notes 7 and 16).

(d) Includes $246 million in 2021 and $255 million in 2020 related to lease liabilities and $42 million and $63 million in 2021 and 2020, respectively, related to research and development costs.

(e) Summary of changes in valuation allowances relating to deferred tax assets follows (millions of dollars):

	2021	2020	2019
Balance, January 1,	$ (243)	$ (222)	$ (237)
Income tax (charge) benefit	8	(21)	(31)
Merger with Linde AG	—	—	18
Other, including write-offs (i)	—	2	26
Translation adjustments	—	(2)	2
Balance, December 31,	$ (235)	$ (243)	$ (222)

(i) 2019 includes $26 million related to the squeeze out of Linde AG (See Note 14).

The company evaluates deferred tax assets quarterly to ensure that estimated future taxable income will be sufficient in character (e.g., capital gain versus ordinary income treatment), amount and timing to result in their recovery. After considering the positive and negative evidence, a valuation allowance is established to reduce the assets to their realizable value when management determines that it is more likely than not (i.e., greater than 50% likelihood) that a deferred tax asset will not be realized. Considerable judgment is required in establishing deferred tax valuation allowances.

As of December 31, 2021, the company had $358 million of deferred tax assets relating to net operating losses ("NOLs") and tax credits and $235 million of valuation allowances. These deferred tax assets include $266 million relating to NOLs of which $84 million expire within 5 years, $53 million expire after 5 years and $129 million have no expiration. The deferred tax assets also include $92 million related to credits of which $5 million expire within 5 years, $83 million expire after 5 years, and $4 million have no expiration. The valuation allowances of $235 million primarily relate to NOLs and are required because management has determined, based on financial projections and available tax strategies, that it is unlikely that the NOLs will be utilized before they expire. If events or circumstances change, valuation allowances are adjusted at that time resulting in an income tax benefit or charge.

The company has $586 million of non-U.S. income taxes accrued related to its investments in subsidiaries and equity investments as of December 31, 2021. A provision has not been made for any additional non-U.S. income tax at December 31, 2021 on approximately $32 billion related to its investments in subsidiaries because the company intends to remain indefinitely reinvested. While the $32 billion could become subject to additional non-U.S. income tax if there is a sale of a subsidiary, or earnings are remitted as dividends, it is not practicable to estimate the unrecognized deferred tax liability.

Uncertain Tax Positions

Unrecognized income tax benefits represent income tax positions taken on income tax returns but not yet recognized in the consolidated financial statements. The company has unrecognized income tax benefits totaling $387 million, $452 million and $472 million as of December 31, 2021, 2020 and 2019, respectively. If recognized, essentially all of the unrecognized tax benefits and related interest and penalties would be recorded as a benefit to income tax expense on the consolidated statements of income.

A reconciliation of the beginning and ending amount of unrecognized tax benefits is as follows:

(Millions of dollars)	2021	2020	2019
Unrecognized income tax benefits, January 1	$ 452	$ 472	$ 319
Additions for tax positions of prior years (a)	11	35	151
Reductions for tax positions of prior years	(11)	(34)	(3)
Additions for current year tax positions	19	11	33
Reductions for settlements with taxing authorities (b)	(60)	(39)	(26)
Foreign currency translation and other	(24)	7	(2)
Unrecognized income tax benefits, December 31	$ 387	$ 452	$ 472

(a) Increase primarily relates to tax positions in the United States and Europe, $66 million in 2019 related to the merger with Linde AG.

(b) Settlements are uncertain tax positions that were effectively settled with the taxing authorities, including positions where the company has agreed to amend its tax returns to eliminate the uncertainty.

The company classifies interest income and expense related to income taxes as tax expense in the consolidated statements of income. The company recognized net interest benefit of $15 million, and expense of $29 million and $1 million for the years ended December 31, 2021, December 31, 2020 and December 31, 2019, respectively. The company had $40 million and $99 million of accrued interest and penalties as of December 31, 2021 and December 31, 2020, respectively which were recorded in other long-term liabilities in the consolidated balance sheets (See Note 7).

As of December 31, 2021, the company remained subject to examination in the following major tax jurisdictions for the tax years as indicated below:

Major tax jurisdictions	Open Years
North and South America	
United States	2017 through 2021
Canada	2014 through 2021
Mexico	2014 through 2021
Brazil	2003 through 2021
Europe and Africa	
France	2014 through 2021
Germany	2016 through 2021
Republic of South Africa	2018 through 2021
Spain	2010 through 2021
United Kingdom	2016 through 2021
Asia and Australia	
Australia	2017 through 2021
China	2016 through 2021
India	2006 through 2021
South Korea	2016 through 2021

The company is currently under audit in a number of jurisdictions. As a result, it is reasonably possible that some of these matters will conclude or reach the stage where a change in unrecognized income tax benefits may occur within the next twelve months. At the time new information becomes available, the company will record any adjustment to income tax expense as required. Final determinations, if any, are not expected to be material to the consolidated financial statements. The company is also subject to income taxes in many hundreds of state and local taxing jurisdictions that are open to tax examinations.

NOTE 6. EARNINGS PER SHARE – LINDE PLC SHAREHOLDERS

Basic and Diluted earnings per share - Linde plc shareholders is computed by dividing Income from continuing operations, Income from discontinued operations, net of tax, and Net income – Linde plc for the period by the weighted average number of either basic or diluted shares outstanding, as follows:

	2021	2020	2019
Numerator (Millions of dollars)			
Income from continuing operations	$ 3,821	$ 2,497	$ 2,183
Income from discontinued operations, net of tax	5	4	102
Net Income – Linde plc	$ 3,826	$ 2,501	$ 2,285
Denominator (Thousands of shares)			
Weighted average shares outstanding	516,507	526,404	540,859
Shares earned and issuable under compensation plans	389	332	235
Weighted average shares used in basic earnings per share	516,896	526,736	541,094
Effect of dilutive securities			
Stock options and awards	4,979	4,421	4,076
Weighted average shares used in diluted earnings per share	521,875	531,157	545,170
Basic earnings per share from continuing operations	$ 7.39	$ 4.74	$ 4.03
Basic earnings per share from discontinued operations	0.01	0.01	0.19
Basic Earnings Per Share	$ 7.40	$ 4.75	$ 4.22
Diluted earnings per share from continuing operations	$ 7.32	$ 4.70	$ 4.00
Diluted earnings per share from discontinued operations	0.01	0.01	0.19
Diluted Earnings Per Share	$ 7.33	$ 4.71	$ 4.19

There were no antidilutive shares for the years ended December 31, 2021, 2020 or 2019.

NOTE 7. SUPPLEMENTAL INFORMATION

Income Statement

(Millions of dollars) **Year Ended December 31,**	2021	2020	2019
Selling, General and Administrative			
Selling	$ 1,342	$ 1,303	$ 1,600
General and administrative	1,847	1,890	1,857
	$ 3,189	$ 3,193	$ 3,457

Year Ended December 31,	2021	2020	2019
Depreciation and Amortization (a)			
Depreciation	$ 3,912	$ 3,861	$ 3,940
Amortization of intangibles (Note 10)	723	765	735
Depreciation and Amortization	$ 4,635	$ 4,626	$ 4,675

Year Ended December 31,	2021	2020	2019
Other Income (Expenses) – Net			
Currency related net gains (losses)	$ (29)	$ (28)	$ (11)
Partnership income	13	10	8
Severance expense	(5)	(5)	(7)
Asset divestiture gains (losses) – net	(31)	(78)	10
Other – net	26	40	68
	$ (26)	$ (61)	$ 68

Year Ended December 31,	2021	2020	2019
Interest Expense – Net			
Interest incurred on debt and other	$ 227	$ 277	$ 284
Interest income	(40)	(55)	(112)
Amortization on acquired debt	(53)	(85)	(96)
Interest capitalized	(57)	(38)	(38)
Bond redemption (b)	—	16	—
	$ 77	$ 115	$ 38

Year Ended December 31,	2021	2020	2019
Income Attributable to Noncontrolling Interests			
Noncontrolling interests' operations (c)	$ 135	$ 125	$ 87
Redeemable noncontrolling interests' operations (Note 14)	—	—	2
Noncontrolling interests from continuing operations	$ 135	$ 125	$ 89
Noncontrolling interests from discontinued operations	—	$ —	$ 7

Balance Sheet

(Millions of dollars) December 31,	2021	2020
Accounts Receivable		
Trade and Other receivables	$ 4,904	$ 4,638
Less: allowance for expected credit losses	(405)	(471)
	$ 4,499	$ 4,167

Receivables

Linde applies loss rates that are lifetime expected credit losses at initial recognition of the receivables. These expected loss rates are based on an analysis of the actual historical default rates for each business, taking regional circumstances into account. If necessary, these historical default rates are adjusted to reflect the impact of current changes in the macroeconomic environment using forward-looking information. The loss rates are also evaluated based on the expectations of the responsible management team regarding the collectability of the receivables. Gross trade receivables aged less than one year were $4,425 million and $4,169 million at December 31, 2021 and December 31, 2020, respectively, and gross receivables aged greater than one year were $329 million and $358 million at December 31, 2021 and December 31, 2020, respectively. Gross other receivables were $150 million and $111 million at December 31, 2021 and December 31, 2020, respectively. Receivables aged greater than one year are generally fully reserved unless specific circumstances warrant exceptions, such as those backed by federal governments.

Provisions for expected credit losses were $129 million, $182 million and $170 million for the twelve months ended December 31, 2021, 2020 and 2019, respectively. The allowance activity in the twelve months ended December 31, 2021 related to write-offs of uncollectible amounts, net of recoveries and currency movements is not material.

December 31,	2021	2020
Inventories		
Raw materials and supplies	$ 399	$ 411
Work in process	334	337
Finished goods	1,000	981
	$ 1,733	$ 1,729

December 31,	2021	2020
Prepaid and Other Current Assets		
Prepaid and other deferred charges (d)	$ 527	$ 516
VAT recoverable	196	261
Unrealized gains on derivatives (Note 12)	101	110
Assets held for sale (Note 2)	—	4
Other	146	221
	$ 970	$ 1,112

December 31,	2021	2020
Other Long-term Assets		
Pension assets (Note 16)	$ 139	$ 55
Insurance contracts (e)	46	61
Long-term receivables, net (f)	105	201
Lease assets (Note 4)	1,016	1,090
Deposits	43	47
Investments carried at cost	18	23
Deferred charges	62	96
Deferred income taxes (Note 5)	242	268
Unrealized gains on derivatives (Note 12)	35	90
Other	278	217
	$ 1,984	$ 2,148

December 31,	2021	2020
Other Current Liabilities		
Accrued expenses	$ 1,248	$ 1,226
Payroll	710	653
VAT payable	295	336
Pension and postretirement (Note 16)	38	34
Interest payable	102	135
Lease liability (Note 4)	262	275
Insurance reserves	19	38
Unrealized losses on derivatives (Note 12)	27	70
Noncontrolling interest redemption and dividend (Note 14)	—	231
Synergy cost accruals (Note 3)	200	199
Other	998	1,135
	$ 3,899	$ 4,332

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December 31,	2021	2020
Other Long-term Liabilities		
Pension and postretirement (Note 16)	$ 1,802	$ 2,963
Tax liabilities for uncertain tax positions (Note 5)	302	355
Tax Act liabilities for deemed repatriation (Note 5)	178	204
Lease liability (Note 4)	747	794
Interest and penalties for uncertain tax positions (Note 5)	40	99
Insurance reserves	56	33
Asset retirement obligation	305	302
Unrealized losses on derivatives (Note 12)	8	11
Synergy cost accruals (Note 3)	253	170
Other	497	588
	$ 4,188	$ 5,519

December 31,	2021	2020
Deferred Credits		
Deferred income taxes (Note 5)	$ 6,239	$ 6,704
Other	759	532
	$ 6,998	$ 7,236

December 31,	2021	2020
Accumulated Other Comprehensive Income (Loss)		
Cumulative translation adjustment - net of taxes:		
Americas (g)	$ (3,985)	$ (3,788)
EMEA (g)	94	1,020
APAC (g)	154	616
Engineering	24	354
Other	(280)	(1,020)
	(3,993)	(2,818)
Derivatives – net of taxes	75	4
Pension/OPEB funded status obligation (net of $305 million and $560 million tax benefit in 2021 and 2020) (Note 16)	(1,130)	(1,876)
	$ (5,048)	$ (4,690)

(a) Depreciation and amortization expense in 2021 include $1,245 million and $618 million, respectively, of Linde AG purchase accounting impacts. In 2020, depreciation and amortization expense include $1,267 million and $653 million, respectively, of Linde AG purchase accounting impacts.

(b) In December 2020, the company repaid $500 million of 4.05% notes and $500 million of 3.00% notes that were due in 2021 resulting in a $16 million interest charge.

(c) In 2021, 2020 and 2019 noncontrolling interests from continuing operations includes $15 million, $57 million and $54 million, respectively, of Linde AG purchase accounting impacts. The decrease in 2021 is primarily related to the deconsolidation of a joint venture with operations in APAC (see Note 2) and the buyout of minority interests in the Republic of South Africa (see Note 14).

(d) Includes estimated income tax payments of $122 million in 2021 and $115 million in 2020.

(e) Consists primarily of insurance contracts and other investments to be utilized for non-qualified pension and OPEB obligations.

(f) The balances at December 31, 2021 and 2020 are net of reserves of $33 million and $34 million, respectively. The amounts in both years relate primarily to long-term notes receivable from customers in APAC and EMEA and government receivables in Brazil.

(g) Americas consists of currency translation adjustments primarily in Canada, Mexico, and Brazil. EMEA relates primarily to Germany, the U.K. and Sweden. APAC relates primarily to China, South Korea, India and Australia.

NOTE 8. PROPERTY, PLANT AND EQUIPMENT – NET

Significant classes of property, plant and equipment are as follows:

(Millions of dollars) **December 31,**	**Depreciable Lives (Yrs)**	**2021**	**2020**
Production plants (primarily 15-year life) (a)	10-20	$ 29,120	$ 28,226
Storage tanks	15-20	4,441	4,461
Transportation equipment and other	3-15	2,973	2,978
Cylinders	10-30	4,474	4,491
Buildings	25-40	3,265	3,327
Land and improvements (b)	0-20	1,121	1,259
Construction in progress		3,062	3,257
		48,456	47,999
Less: accumulated depreciation		(22,453)	(19,288)
		$ 26,003	$ 28,711

(a) - Depreciable lives of production plants related to long-term customer supply contracts are generally consistent with the contract lives.

(b) - Land is not depreciated.

NOTE 9. GOODWILL

Changes in the carrying amount of goodwill for the years ended December 31, 2021 and 2020 were as follows:

(Millions of dollars)	**Americas**	**EMEA**	**APAC**	**Engineering**	**Other**	**Total**
Balance, December 31, 2019	$ 9,042	$ 10,243	$ 4,957	$ 2,470	$ 307	$ 27,019
Acquisitions	13	—	—	—	—	13
Foreign currency translation and other	35	643	305	212	23	1,218
Disposals	(7)	(42)	—	—	—	(49)
Balance, December 31, 2020	9,083	10,844	5,262	2,682	330	28,201
Acquisitions	45	1	—	—	—	46
Foreign currency translation and other	(41)	(559)	(173)	(186)	(7)	(966)
Disposals (Note 2)	—	(8)	(235)	—	—	(243)
Balance, December 31, 2021	$ 9,087	$ 10,278	$ 4,854	$ 2,496	$ 323	$ 27,038

Linde has performed its goodwill impairment tests annually during the fourth quarter of each year and has determined that the fair value of each of its reporting units was substantially in excess of its carrying value. For the 2021 test, the company applied the FASB's accounting guidance which allows the company to first assess qualitative factors to determine the extent of additional quantitative analysis, if any, that may be required to test goodwill for impairment. Based on the qualitative assessments performed, the company concluded that it was more likely than not that the fair value of each reporting unit substantially exceeded its carrying value and therefore, further quantitative analysis was not required. As a result, no impairment was recorded. There were no indicators of impairment through December 31, 2021.

NOTE 10. OTHER INTANGIBLE ASSETS

The following is a summary of Linde's other intangible assets at December 31, 2021 and 2020:

(Millions of dollars) For the year ended December 31, 2021	Customer Relationships	Brands/ Tradenames	Other Intangible Assets	Total
Cost:				
Balance, December 31, 2020	$ 13,776	$ 2,895	$ 1,697	$ 18,368
Additions	12	—	61	73
Foreign currency translation	(490)	(113)	(69)	(672)
Disposals (Note 2)	(1,085)	(94)	(46)	(1,225)
Other *	(354)	(3)	(14)	(371)
Balance, December 31, 2021	11,859	2,685	1,629	16,173
Less: accumulated amortization:				
Balance, December 31, 2020	(1,470)	(118)	(596)	(2,184)
Amortization expense (Note 7)	(553)	(45)	(125)	(723)
Foreign currency translation	64	3	22	89
Disposals (Note 2)	66	1	13	80
Other *	352	—	15	367
Balance, December 31, 2021	(1,541)	(159)	(671)	(2,371)
Net intangible asset balance at December 31, 2021	$ 10,318	$ 2,526	$ 958	$ 13,802

(Millions of dollars) For the year ended December 31, 2020	Customer Relationships	Brands/ Tradenames	Other Intangible Assets	Total
Cost:				
Balance, December 31, 2019	$ 13,205	$ 2,764	$ 1,612	$ 17,581
Additions	5	—	56	61
Foreign currency translation	632	134	47	813
Disposals	(2)	—	(20)	(22)
Other *	(64)	(3)	2	(65)
Balance, December 31, 2020	13,776	2,895	1,697	18,368
Less: accumulated amortization:				
Balance, December 31, 2019	(885)	(69)	(490)	(1,444)
Amortization expense (Note 7)	(589)	(45)	(131)	(765)
Foreign currency translation	(53)	(3)	1	(55)
Disposals	1	—	20	21
Other *	56	(1)	4	59
Balance, December 31, 2020	(1,470)	(118)	(596)	(2,184)
Net balance at December 31, 2020	$ 12,306	$ 2,777	$ 1,101	$ 16,184

*Other primarily relates to the write-off of fully amortized assets and reclassifications. 2021 Other is primarily due to merger related customer lists in the Americas.

There are no expected residual values related to these intangible assets. Amortization expense for the years ended December 31, 2021, 2020 and 2019 was $723 million, $765 million and $735 million, respectively. The remaining weighted-average amortization period for intangible assets is approximately 24 years.

Total estimated annual amortization expense related to finite-lived intangibles is as follows:

(Millions of dollars)		
2022	$	615
2023		579
2024		571
2025		530
2026		511
Thereafter		9,183
Total amortization related to finite-lived intangible assets		11,989
Indefinite-lived intangible assets at December 31, 2021		1,813
Net intangible assets at December 31, 2021	$	13,802

NOTE 11. DEBT

The following is a summary of Linde's outstanding debt at December 31, 2021 and 2020:

(Millions of dollars)	December 31, 2021	December 31, 2020
SHORT-TERM		
Commercial paper	$ 278	$ 2,527
Other borrowings (primarily non U.S.)	885	724
Total short-term debt	1,163	3,251
LONG-TERM (a)		
(U.S. dollar denominated unless otherwise noted)		
3.875% Euro denominated notes due 2021 (c)	—	748
0.250% Euro denominated notes due 2022 (b) (f)	1,137	1,226
2.45% Notes due 2022 (e)	—	599
2.20% Notes due 2022	500	499
2.70% Notes due 2023	500	499
2.00% Euro denominated notes due 2023 (b)	759	832
5.875% GBP denominated notes due 2023 (b)	432	460
1.20% Euro denominated notes due 2024	625	671
1.875% Euro denominated notes due 2024 (b)	356	389
2.65% Notes due 2025	399	398
1.625% Euro denominated notes due 2025	565	607
0.00% Euro denominated notes due 2026 (d)	799	—
3.20% Notes due 2026	725	725
3.434% Notes due 2026	197	196
1.652% Euro denominated notes due 2027	94	100
0.250% Euro denominated notes due 2027	850	914
1.00% Euro denominated notes due 2028 (b)	879	966
1.10% Notes due 2030	696	696
1.90% Euro denominated notes due 2030	118	127
0.550% Euro denominated notes due 2032	847	909
0.375% Euro denominated notes due 2033 (d)	565	—
3.55% Notes due 2042	664	664
2.00% Notes due 2050	296	296
1.00% Euro denominated notes due 2051 (d)	788	—
Non U.S. borrowings	243	372
Other	10	10
	13,044	12,903
Less: current portion of long-term debt	(1,709)	(751)
Total long-term debt	11,335	12,152
Total debt	$ 14,207	$ 16,154

(a) Amounts are net of unamortized discounts, premiums and/or debt issuance costs as applicable.

(b) December 31, 2021 and 2020 included a cumulative $42 million and $79 million adjustment to carrying value, respectively, related to hedge accounting of interest rate swaps.

(c) In June 2021, the company repaid €600 million of 3.875% note that became due.

(d) In September 2021, Linde issued €700 million of 0.000% notes due 2026, €500 million of 0.375% notes due 2033, and €700 million of 1.000% notes due 2051.

(e) In November 2021, Linde repaid $600 million of 2.45% notes that were due in 2022. There was no impact to interest within the consolidated statements of income.

(f) In January 2022, Linde repaid €1.0 billion of 0.250% notes that became due in 2022.

Credit Facilities

On March 26, 2019 the company and certain of its subsidiaries entered into an unsecured revolving credit agreement ("the Credit Agreement") with a syndicate of banking institutions, which became effective on March 29, 2019. The Credit Agreement provides for total commitments of $5.0 billion, which may be increased up to $6.5 billion, subject to receipt of additional commitments and satisfaction of customary conditions. There are no financial maintenance covenants contained within the Credit Agreement. The revolving credit facility expires on March 26, 2024 with the option to request two one-year extensions of the expiration date. No borrowings were outstanding under the Credit Agreement as of December 31, 2021.

Other Debt Information

As of December 31, 2021 and 2020, the weighted-average interest rate of short-term borrowings outstanding was 0.0% in both years.

Expected maturities of long-term debt are as follows:

(Millions of dollars)		
2022	$	1,709
2023		1,706
2024		988
2025		984
2026		1,735
Thereafter		5,922
	$	13,044

As of December 31, 2021, the amount of Linde's assets pledged as collateral was immaterial.

See Note 13 for the fair value information related to debt.

NOTE 12. FINANCIAL INSTRUMENTS

In its normal operations, Linde is exposed to market risks relating to fluctuations in interest rates, foreign currency exchange rates, energy and commodity costs. The objective of financial risk management at Linde is to minimize the negative impact of such fluctuations on the company's earnings and cash flows. To manage these risks, among other strategies, Linde routinely enters into various derivative financial instruments ("derivatives") including interest-rate swap and treasury rate lock agreements, currency-swap agreements, forward contracts, currency options, and commodity-swap agreements. These instruments are not entered into for trading purposes and Linde only uses commonly traded and non-leveraged instruments.

There are three types of derivatives that the company enters into: (i) those relating to fair-value exposures, (ii) those relating to cash-flow exposures, and (iii) those relating to foreign currency net investment exposures. Fair-value exposures relate to recognized assets or liabilities, and firm commitments; cash-flow exposures relate to the variability of future cash flows associated with recognized assets or liabilities, or forecasted transactions; and net investment exposures relate to the impact of foreign currency exchange rate changes on the carrying value of net assets denominated in foreign currencies.

When a derivative is executed and hedge accounting is appropriate, it is designated as either a fair-value hedge, cash-flow hedge, or a net investment hedge. Currently, Linde designates all interest-rate and treasury-rate locks as hedges for accounting purposes; however, cross-currency contracts are generally not designated as hedges for accounting purposes. Certain currency contracts related to forecasted transactions are designated as hedges for accounting purposes. Whether designated as hedges for accounting purposes or not, all derivatives are linked to an appropriate underlying exposure. On an ongoing basis, the company assesses the hedge effectiveness of all derivatives designated as hedges for accounting purposes to determine if they continue to be highly effective in offsetting changes in fair values or cash flows of the underlying hedged items. If it is determined that the hedge is not highly effective, through the use of a qualitative assessment, then hedge accounting will be discontinued prospectively.

Counterparties to Linde's derivatives are major banking institutions with credit ratings of investment grade or better. The company has Credit Support Annexes ("CSAs") in place for certain entities with their principal counterparties to minimize potential default risk and to mitigate counterparty risk. Under the CSAs, the fair values of derivatives for the purpose of interest rate and currency management are collateralized with cash on a regular basis. As of December 31, 2021, the impact of such collateral posting arrangements on the fair value of derivatives was insignificant. Management believes the risk of incurring losses on derivative contracts related to credit risk is remote and any losses would be immaterial.

The following table is a summary of the notional amount and fair value of derivatives outstanding at December 31, 2021 and 2020 for consolidated subsidiaries:

			Fair Value			
(Millions of dollars)	Notional Amounts		Assets (a)		Liabilities (a)	
December 31,	2021	2020	2021	2020	2021	2020
Derivatives Not Designated as Hedging Instruments:						
Currency contracts:						
Balance sheet items	$ 4,427	$ 6,470	$ 22	$ 72	$ 17	$ 48
Forecasted transactions	537	823	6	16	11	12
Cross-currency swaps	148	260	21	24	4	7
Commodity contracts	N/A	N/A	—	1	—	—
Total	$ 5,112	$ 7,553	$ 49	$ 113	$ 32	$ 67
Derivatives Designated as Hedging Instruments:						
Currency contracts:						
Balance sheet items	$ —	$ —	$ —	$ —	$ —	$ —
Forecasted transactions	758	355	14	20	3	14
Commodity contracts	N/A	N/A	49	3	—	—
Interest rate swaps	1,251	1,923	24	64	—	—
Total Hedges	$ 2,009	$ 2,278	$ 87	$ 87	$ 3	$ 14
Total Derivatives	$ 7,121	$ 9,831	$ 136	$ 200	$ 35	$ 81

(a) December 31, 2021 and 2020 included current assets of $101 million and $110 million, which are recorded in prepaid and other current assets; long-term assets of $35 million and $90 million, which are recorded in other long-term assets; current liabilities of $27 million and $70 million, which are recorded in other current liabilities; and long-term liabilities of $8 million and $11 million, which are recorded in other long-term liabilities.

Balance Sheet Items

Foreign currency contracts related to balance sheet items consist of forward contracts entered into to manage the exposure to fluctuations in foreign-currency exchange rates on recorded balance sheet assets and liabilities denominated in currencies other than the functional currency of the related operating unit. Certain forward currency contracts are entered into to protect underlying monetary assets and liabilities denominated in foreign currencies from foreign exchange risk and are not designated as hedging instruments. For balance sheet items that are not designated as hedging instruments, the fair value adjustments on these contracts are offset by the fair value adjustments recorded on the underlying monetary assets and liabilities.

Forecasted Transactions

Foreign currency contracts related to forecasted transactions consist of forward contracts entered into to manage the exposure to fluctuations in foreign-currency exchange rates on (1) forecasted purchases of capital-related equipment and services, (2) forecasted sales, or (3) other forecasted cash flows denominated in currencies other than the functional currency of the related operating units. For forecasted transactions that are designated as cash flow hedges, fair value adjustments are recorded to accumulated other comprehensive income ("AOCI") with deferred amounts reclassified to earnings over the same time period as the income statement impact of the associated purchase. For forecasted transactions that do not qualify for cash flow hedging relationships, fair value adjustments are recorded directly to earnings.

Cross-Currency Swaps

Cross-currency interest rate swaps are entered into to limit the foreign currency risk of future principal and interest cash flows associated with intercompany loans, and to a more limited extent bonds, denominated in non-functional currencies. The fair value adjustments on the cross-currency swaps are recorded to earnings, where they are offset by fair value adjustments on the underlying intercompany loan or bond.

Commodity Contracts

Commodity contracts are entered into to manage the exposure to fluctuations in commodity prices, which arise in the normal course of business from its procurement transactions. To reduce the extent of this risk, Linde enters into a limited number of electricity, natural gas, and propane gas derivatives. For forecasted transactions that are designated as cash flow hedges, fair value adjustments are recorded to accumulated other comprehensive income ("AOCI") with deferred amounts reclassified to earnings over the same time period as the income statement impact of the associated purchase.

Net Investment Hedges

As of December 31, 2021, Linde has €4.2 billion ($4.8 billion) Euro-denominated notes and intercompany loans that are designated as hedges of the net investment positions in foreign operations. Since hedge inception, the deferred gain recorded within cumulative translation adjustment component of AOCI in the consolidated balance sheet and the consolidated statement of comprehensive income is $140 million (deferred gain of $140 million for the year ended December 31, 2021).

As of December 31, 2021, exchange rate movements relating to previously designated hedges that remain in AOCI is a loss of $42 million. These movements will remain in AOCI, until appropriate, such as upon sale or liquidation of the related foreign operations at which time amounts will be reclassified to the consolidated statements of income.

Interest Rate Swaps

Linde uses interest rate swaps to hedge the exposure to changes in the fair value of financial assets and financial liabilities as a result of interest rate changes. These interest rate swaps effectively convert fixed-rate interest exposures to variable rates; fair value adjustments are recognized in earnings along with an equally offsetting charge/benefit to earnings for the changes in the fair value of the underlying financial asset or financial liability. The notional value of outstanding interest rate swaps of Linde with maturity dates from 2022 through 2028 was $1,251 million at December 31, 2021 and $1,923 million at December 31, 2020 (see Note 11 for further information).

Terminated Treasury Rate Locks

The unrecognized aggregated losses related to terminated treasury rate lock contracts on the underlying $500 million 2.20% fixed-rate notes that mature in 2022 at December 31, 2021 and December 31, 2020 were immaterial in both periods. The unrecognized gains/(losses) for the treasury rate locks are shown in AOCI and are being recognized on a straight line basis to interest expense - net over the term of the underlying debt agreements.

Derivatives Impact on Consolidated Statements of Income

The following table summarizes the impact of the company's derivatives on the consolidated statements of income:

(Millions of dollars)	Amount of Pre-Tax Gain (Loss) Recognized in Earnings *		
December 31,	2021	2020	2019
Derivatives Not Designated as Hedging Instruments			
Currency contracts:			
Balance sheet items:			
Debt-related	$ 42	$ (125)	$ 253
Other balance sheet items	(5)	(40)	65
Total	$ 38	$ (165)	$ 318

* The gains (losses) on balance sheet items are offset by gains (losses) recorded on the underlying hedged assets and liabilities. Accordingly, the gains (losses) for the derivatives and the underlying hedged assets and liabilities related to debt items are recorded in the consolidated statements of income as

interest expense-net. Other balance sheet items and anticipated net income gains (losses) are recorded in the consolidated statements of income as other income (expenses)-net.

The amounts of gain or loss recognized in AOCI and reclassified to the consolidated statement of income was immaterial for the year ended December 31, 2021. Net losses expected to be reclassified to earnings during the next twelve months are also not material.

NOTE 13. FAIR VALUE DISCLOSURES

The fair value hierarchy prioritizes the inputs to valuation techniques used to measure fair value into three broad levels as follows:

Level 1 – quoted prices in active markets for identical assets or liabilities
Level 2 – quoted prices for similar assets and liabilities in active markets or inputs that are observable
Level 3 – inputs that are unobservable (for example cash flow modeling inputs based on assumptions)

Assets and Liabilities Measured at Fair Value on a Recurring Basis

The following table summarizes assets and liabilities measured at fair value on a recurring basis at December 31, 2021 and 2020:

	Fair Value Measurements Using					
(Millions of dollars)	Level 1		Level 2		Level 3	
	2021	2020	2021	2020	2021	2020
Assets						
Derivative assets	$ —	$ —	$ 136	$ 200	$ —	$ —
Investments and securities *	42	21	—	—	20	47
Total	$ 42	$ 21	$ 136	$ 200	$ 20	$ 47
Liabilities						
Derivative liabilities	$ —	$ —	$ 35	$ 81	$ —	$ —

* Investments and securities are recorded in prepaid and other current assets and other long-term assets in the company's consolidated balance sheets.

Level 1 investments and securities are marketable securities traded on an exchange. Level 2 investments are based on market prices obtained from independent brokers or determined using quantitative models that use as their basis readily observable market parameters that are actively quoted and can be validated through external sources, including third-party pricing services, brokers and market transactions. Level 3 investments and securities consist of a venture fund. For the valuation, Linde uses the net asset value received as part of the fund's quarterly reporting, which for the most part is not based on quoted prices in active markets. In order to reflect current market conditions, Linde proportionally adjusts these by observable market data (stock exchange prices) or current transaction prices.

Changes in level 3 investments and securities were immaterial.

The fair value of cash and cash equivalents, short-term debt, accounts receivable-net, and accounts payable approximate carrying value because of the short-term maturities of these instruments.

The fair value of long-term debt is estimated based on the quoted market prices for the same or similar issues. Long-term debt is categorized within either Level 1 or Level 2 of the fair value hierarchy depending on the trading volume of the issues and whether or not they are actively quoted in the market as opposed to traded through over-the-counter transactions. At December 31, 2021, the estimated fair value of Linde’s long-term debt portfolio was $13,219 million versus a carrying value of $13,044 million. At December 31, 2020 the estimated fair value of Linde’s long-term debt portfolio was $13,611 million versus a carrying value of $12,903 million. Differences between the carrying value and the fair value are attributable to fluctuations in interest rates subsequent to when the debt was issued and relative to stated coupon rates.

NOTE 14. EQUITY AND NONCONTROLLING INTERESTS

Linde plc Shareholders' Equity

At December 31, 2021 and 2020, Linde has total authorized share capital of €1,825,000 divided into 1,750,000,000 ordinary shares of €0.001 each, 25,000 A ordinary shares of €1.00 each, 25,000 deferred shares of €1.00 each and 25,000,000 preferred shares of €0.001 each.

At December 31, 2021 there were 552,012,862 and 508,680,879 of Linde plc ordinary shares issued and outstanding, respectively. At December 31, 2021 there were no shares of A ordinary shares, deferred shares or preferred shares issued or outstanding.

At December 31, 2020 there were 552,012,862 and 523,294,529 of Linde plc ordinary shares issued and outstanding, respectively. At December 31, 2020, there were no shares of A ordinary shares, deferred shares or preferred shares issued or outstanding.

Linde's Board of Directors may from time to time authorize the issuance of one or more series of preferred stock and, in connection with the creation of such series, determine the characteristics of each such series including, without limitation, the preference and relative, participating, optional or other special rights, and the qualifications, limitations or restrictions of the series.

Other Linde plc Ordinary Share and Treasury Share Transactions

Linde may issue new ordinary shares for dividend reinvestment and stock purchase plans and employee savings and incentive plans. The number of new Linde ordinary shares issued from the merger date through December 31, 2019 was 958,293 shares. No new ordinary shares were issued in 2020 or 2021.

On December 10, 2018 the Linde board of directors approved the repurchase of $1.0 billion of its ordinary shares under which Linde had repurchased 6,385,887 shares through December 31, 2019 (4,068,642 shares were repurchased through December 31, 2018). Linde completed the repurchases under this program in the first quarter of 2019.

On January 22, 2019 the company's board of directors approved the additional repurchase of $6.0 billion of its ordinary shares under which Linde had repurchased 24,847,354 shares through December 31, 2021 (24,310,534 shares were repurchased through December 31, 2020). This program expired on February 1, 2021.

On January 25, 2021 the company's board of directors approved the additional repurchase of $5.0 billion of its ordinary shares under which Linde had repurchased 15,103,335 shares through December 31, 2021. This program is set to expire on July 31, 2023.

On February 28, 2022 the Linde board of directors authorized a new share repurchase program for up to $10.0 billion of its ordinary shares expiring on July 31, 2024.

Noncontrolling Interests

Noncontrolling interest ownership changes are presented within the consolidated statements of equity. The decrease during 2021 is primarily related to the deconsolidation of a joint venture with operations in APAC (see Note 2).

The decrease during 2020 primarily relates to the initiated buyout of minority interests in the Republic of South Africa. As of December 31, 2020, the conditions of the buyout were met obligating the company to execute in January 2021. Therefore, the company reclassified $196 million from non-controlling interest to other current liabilities reflecting the transaction price. An additional $35 million of dividends declared to the minority owners, reflected on the Dividends and other capital reductions line, was also reclassified to other current liabilities at December 31, 2020 and was paid in January 2021.

The $2,921 million decrease during 2019 was primarily driven by the completion of the cash merger squeeze-out of the 8% of Linde AG shares which were not tendered in the Exchange Offer related to the merger.

Redeemable Noncontrolling Interests

Noncontrolling interests with redemption features, such as put/sell options, that are not solely within the company's control ("redeemable noncontrolling interests") are reported separately in the consolidated balance sheets at the greater of carrying value or redemption value. For redeemable noncontrolling interests that are not yet exercisable, Linde calculates the redemption value by accreting the carrying value to the redemption value over the period until exercisable. If the redemption value is greater than the carrying value, any increase is adjusted directly to retained earnings and does not impact net income. At December 31, 2021 and 2020, the redeemable noncontrolling interest balance includes an industrial gas business in EMEA where the noncontrolling shareholders have put options.

NOTE 15. SHARE-BASED COMPENSATION

Share-based compensation expense was $128 million in 2021 ($133 million and $95 million in 2020 and 2019, respectively). The related income tax benefit recognized was $64 million in 2021 ($79 million and $42 million in 2020 and 2019, respectively). The expense was primarily recorded in selling, general and administrative expenses and no share-based compensation expense was capitalized.

Summary of Plans

The 2021 Linde plc Long Term Incentive Plan (the “2021 Plan") was adopted by the Board of Directors and shareholders of Linde plc on July 26, 2021. Upon adoption of the 2021 Plan, any authorized shares that remained available for grant for new awards under the Amended and Restated 2009 Linde Long Term Incentive Plan (the “2009 Plan”) were cancelled. The 2021 Plan permits awards of stock options, stock appreciation rights, restricted stock and restricted stock units, performance-based stock units and other equity awards to eligible officer and non-officer employees and non-employee directors of the company and its affiliates. As of December 31, 2021, 8,995,710 shares remained available for equity grants under the 2021 Plan, of which 2,995,710 shares may be granted as awards other than options or stock appreciation rights.

Exercise prices for options granted under the 2021 Plan may not be less than the closing market price of the company’s ordinary shares on the date of grant and granted options may not be re-priced or exchanged without shareholder approval. Options granted under the 2021 Plan subject only to time vesting requirements may become partially exercisable after a minimum of one year after the date of grant but may not become fully exercisable until at least three years have elapsed from the date of grant, and all options have a maximum duration of ten years.

In connection with the business combination, on October 31, 2018 the company's Board of Directors adopted the Long Term Incentive Plan 2018 of Linde plc (“the LTIP 2018”), the purpose of which was to replace certain outstanding Linde AG equity based awards that were terminated. Under the LTIP 2018, the aggregate number of shares available for replacement option rights and replacement restricted share units was set at 473,128. As of December 31, 2021, 285,113 shares remained available for grant, and since the company was obligated to make these replacement awards only in 2019, no further grants will be made under this plan.

Exercise prices for the replacement option rights that were granted in 2019 under the LTIP 2018 were equal to EUR 1.67 ($1.92 as converted at an exchange rate from the time the exchange offer was completed as the option rights are exercisable in U.S. dollars on the NYSE) as prescribed in the business combination agreement. Each replacement option right granted under the LTIP 2018 is subject to vesting based on continued service until the end of the four-year waiting period applicable to the relevant Linde AG award that had been granted before the business combination. After vesting, each option right will be exercisable for one year.

In order to satisfy option exercises and other equity grants, the company may issue authorized but previously unissued shares or it may issue treasury shares.

Stock Option Fair Value

The company utilizes the Black-Scholes Options-Pricing Model to determine the fair value of stock options consistent with that used in prior years. Management is required to make certain assumptions with respect to selected model inputs, including anticipated changes in the underlying stock price (i.e., expected volatility) and option exercise activity (i.e., expected life). Expected volatility is based on the historical volatility of the company’s stock over the most recent period commensurate with the estimated expected life of the company’s stock options and other factors. The expected life of options granted, which represents the period of time that the options are expected to be outstanding, is based primarily on historical exercise experience. The expected dividend yield is based on the company’s most recent history and expectation of dividend payouts. The risk-free rate is based on the U.S. Treasury yield curve in effect at the time of grant for a period commensurate with the estimated expected life. If factors change and result in different assumptions in future periods, the stock option expense that the company records for future grants may differ significantly from what the company has recorded in the current period.

The weighted-average fair value of options granted during 2021 was $37.80 ($17.37 in 2020 and $23.38 in 2019) based on the Black-Scholes Options-Pricing model. The increase in grant date fair value year-over-year is primarily attributable to the increase in the stock price. The weighted-average fair value of replacement option rights granted in 2019 was $160.08 based on intrinsic value method.

The following weighted-average assumptions were used to value the grants in 2021, 2020 and 2019:

Year Ended December 31,	2021	2020	2019
Dividend yield	1.7 %	2.2 %	2.0 %
Volatility	18.4 %	15.8 %	14.3 %
Risk-free interest rate	1.10 %	0.60 %	2.38 %
Expected term years	6	6	6

The following table summarizes option activity under the plans as of December 31, 2021 and changes during the period then ended (averages are calculated on a weighted basis; life in years; intrinsic value expressed in millions):

Activity	Number of Options (000's)	Average Exercise Price	Average Remaining Life	Aggregate Intrinsic Value
Outstanding at January 1, 2021	8,067	$ 136.05		
Granted	831	253.68		
Exercised	(1,672)	121.40		
Cancelled or expired	(60)	207.35		
Outstanding at December 31, 2021	7,166	$ 152.56	6.0	$ 1,389
Exercisable at December 31, 2021	5,297	$ 132.84	5.0	$ 1,131

The aggregate intrinsic value represents the difference between the company's closing stock price of $346.43 as of December 31, 2021 and the exercise price multiplied by the number of in the money options outstanding as of that date. The total intrinsic value of stock options exercised during 2021 was $294 million ($264 million and $219 million in 2020 and 2019, respectively).

Cash received from option exercises under all share-based payment arrangements for 2021 was $50 million ($36 million and $64 million in 2020 and 2019, respectively). The cash tax benefit realized from share-based compensation totaled $64 million for 2021 ($70 million and $56 million cash tax benefit in 2020 and 2019, respectively).

As of December 31, 2021, $17 million of unrecognized compensation cost related to non-vested stock options is expected to be recognized over a weighted-average period of approximately 1 year.

Performance-Based and Restricted Stock Awards

In 2021, the company granted 187,830 performance-based stock awards under the 2009 Plan to senior management that vest, subject to the attainment of pre-established minimum performance criteria, principally on the third anniversary of their date of grant. These awards are tied to either after tax return on capital ("ROC") performance or relative total shareholder return ("TSR") performance versus that of the S&P 500 (weighted 67%) and Eurofirst 300 (weighted 33%). The actual number of shares issued in settlement of a vested award can range from zero to 200 percent of the target number of shares granted based upon the company's attainment of specified performance targets at the end of a three-year period. Compensation expense related to these awards is recognized over the three-year performance period based on the fair value of the closing market price of the company's ordinary shares on the date of the grant and the estimated performance that will be achieved. Compensation expense for ROC awards will be adjusted during the three-year performance period based upon the estimated performance levels that will be achieved. TSR awards are measured at their grant date fair value and not subsequently re-measured.

The weighted-average fair value of ROC performance-based stock awards granted in 2021 was $241.10 ($161.56 in 2020 and $168.47 in 2019). These fair values are based on the closing market price of Linde's ordinary shares on the grant date adjusted for dividends that will not be paid during the vesting period.

The weighted-average fair value of performance-based stock tied to relative TSR performance granted in 2021 was $301.04 ($198.61 in 2020 and $215.85 in 2019) and was estimated using a Monte Carlo simulation performed as of the grant date.

There were 175,597 restricted stock units granted to employees by Linde during 2021. The weighted-average fair value of restricted stock units granted during 2021 was $242.60 ($174.95 in 2020 and $165.04 in 2019). These fair values are based on the closing market price of Linde's ordinary shares on the grant date adjusted for dividends that will not be paid during the vesting period. Compensation expense related to the restricted stock units is recognized over the vesting period.

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The following table summarizes non-vested performance-based and restricted stock award activity as of December 31, 2021 and changes during the period then ended (shares based on target amounts, averages are calculated on a weighted basis):

	Performance-Based		Restricted Stock	
	Number of Shares (000's)	Average Grant Date Fair Value	Number of Shares (000's)	Average Grant Date Fair Value
Non-vested at January 1, 2021	437	$ 179.76	688	$ 148.56
Granted	188	262.56	176	242.60
Vested	—	—	(213)	147.84
Cancelled and Forfeited	(15)	221.70	(15)	206.65
Non-vested at December 31, 2021	610	$ 204.39	636	$ 172.90

There are approximately 14 thousand performance-based shares and 15 thousand restricted stock shares that are non-vested at December 31, 2021 which will be settled in cash due to foreign regulatory limitations. The liability related to these grants reflects the current estimate of performance that will be achieved and the current share price.

As of December 31, 2021, $47 million of unrecognized compensation cost related to performance-based awards and $31 million of unrecognized compensation cost related to the restricted stock awards is expected to be recognized primarily through the first quarter of 2024.

NOTE 16. RETIREMENT PROGRAMS

Defined Benefit Pension Plans - U.S.

The Linde retirement plans are non-contributory defined benefit plans covering eligible employees and its participating affiliates. Effective July 1, 2002, the Linde U.S. Pension Plan was amended to give participating employees a one-time irrevocable choice between a traditional benefit (the "Traditional Design") and an account-based benefit (the "Account-Based Design"). The Traditional Design pays a monthly benefit based on years of service and average pay during the last years of the participant's career with Linde. The Account-Based Design gives participants annual pay credits equal to 4% of eligible compensation, plus interest credits based on long-term treasury rates on the accumulated account balance. This new formula applies to all new employees hired after April 30, 2002 into businesses adopting this plan. The U.S. pension plan assets are comprised of a diversified mix of investments, including corporate equities, government securities and corporate debt securities. Linde has several plans that provide supplementary retirement benefits primarily to higher level employees that are unfunded and are nonqualified for federal tax purposes. Pension coverage for employees of certain of Linde's non-U.S. subsidiaries generally is provided by those companies through separate plans. Obligations under such plans are primarily provided for through diversified investment portfolios, with some smaller plans provided for under insurance policies or by book reserves.

Defined Benefit Pension Plans - Non-U.S.

Linde has Non-U.S., defined benefit commitments primarily in Germany and the U.K that include pension plan assets comprised of a diversified mix of investments. The defined benefit commitments in Germany relate to old age pensions, invalidity pensions and surviving dependents pensions. These commitments also take into account vested rights for periods of service prior to January 1, 2002 based on earlier final-salary pension plan rules. In addition, there are direct commitments in respect of the salary conversion scheme for the form of cash balance plans. The resulting pension payments are calculated on the basis of an interest guarantee and the performance of the corresponding investment. There are no minimum funding requirements. The pension obligations in Germany are partly funded by a Contractual Trust Agreement (CTA). Defined benefit commitments in the U.K. prior to July 1, 2003 are earnings-related and dependent on the period of service. Such commitments relate to old age pensions, invalidity pensions and surviving dependents pensions. Beginning in April 1, 2011, the amount of future increases in inflation-linked pensions and of increases in pensionable emoluments was restricted.

Multi-employer Pension Plans

In the United States Linde participates in eight multi-employer defined benefit pension plans ("MEPs"), pursuant to the terms of collective bargaining agreements, that cover approximately 200 union-represented employees. The collective bargaining agreements expire on different dates through 2026. In connection with such agreements, the company is required to make periodic contributions to the MEPs in accordance with the terms of the respective collective bargaining agreements. Linde's participation in these plans is not material either at the plan level or in the aggregate. For all MEPs, Linde's contributions were significantly less than 1% of the total contributions to each plan for 2020 and 2019. Total 2021 contributions were not yet available from the MEPs.

Linde has obtained the most recently available Pension Protection Act ("PPA") annual funding notices from the Trustees of the MEPs. As of December 31, 2021, there were four Red Zone plans, deemed to be in "critical" or "critical and declining" status that have implemented financial improvement or rehabilitation plans. Linde does not currently anticipate significant future obligations due to the funding status of these plans and such obligation would be immaterial. If Linde determined it was probable that it would withdraw from an MEP, the company would record a liability for its portion of the MEP's unfunded pension obligations, as calculated at that time. Historically, such withdrawal payments have not been significant.

Defined Contribution Plans

Linde's U.S. employees are eligible to participate in defined contribution savings plans offered by their applicable business. Employee contribution percentages vary by plan and are subject to the maximum allowable by IRS regulations.The cost for these defined contribution plans was $51 million in 2021, $46 million in 2020 and $47 million in 2019 (these costs are not included in the tables that follow).

The defined contribution plans include a non-leveraged employee stock ownership plan ("ESOP") which covers all employees participating in this plan. The collective number of shares of Linde ordinary shares in the ESOP totaled 1,761,608 at December 31, 2021.

Certain non-U.S. subsidiaries of the company also sponsor defined contribution plans where contributions are determined under various formulas. The expense for these plans was $101 million in 2021, $106 million in 2020 and $95 million in 2019 (these expenses are not included in the tables that follow).

Postretirement Benefits Other Than Pensions (OPEB)

Linde provides health care and life insurance benefits to certain eligible retired employees. These benefits are provided through various insurance companies and healthcare providers. The company does not currently fund its postretirement benefits obligations. Linde's retiree plans may be changed or terminated by Linde at any time for any reason with no liability to current or future retirees.

Linde uses a measurement date of December 31 for its pension and other post-retirement benefit plans.

Pension and Postretirement Benefit Costs

The components of net pension and postretirement benefits other than pension ("OPEB") costs for 2021, 2020 and 2019 are shown in the table below:

(Millions of dollars)	Pensions			OPEB		
Year Ended December 31,	2021	2020	2019	2021	2020	2019
Amount recognized in Operating Profit						
Service cost	$ 155	$ 150	$ 142	$ 2	$ 2	$ 2
Amount recognized in Net pension and OPEB cost (benefit), excluding service cost						
Interest cost	151	208	261	3	5	7
Expected return on plan assets	(521)	(482)	(462)	—	—	—
Net amortization and deferral	176	90	61	(5)	(4)	(4)
Curtailment and termination benefits (a)	—	—	8	—	—	—
Settlement charges (b)	4	6	97	—	—	—
	$ (190)	$ (178)	$ (35)	$ (2)	$ 1	$ 3
Net periodic benefit cost (benefit)	$ (35)	$ (28)	$ 107	$ —	$ 3	$ 5

(a) In 2019, Linde recorded curtailment gains of $9 million and a charge of $17 million for termination benefits, primarily in connection with a defined benefit pension plan freeze.

(b) Linde recorded a pension settlement charge of $4 million and $6 million during the third quarter of 2021 and 2020, respectively. Settlement charges were triggered by lump sum benefit payments made from a U.S. non-qualified plan.

In the first quarter of 2019, benefits of $91 million were paid related to the settlement of a U.S. non-qualified plan. Such benefits were triggered by a change in control provision and resulted in a settlement charge of $51 million. In the third and fourth quarters of 2019, Linde recorded pension settlement charges of $40 million and $6 million, respectively, related to lump sum payments made from a U.S. qualified plan. These payments were triggered by merger-related divestitures.

Funded Status

Changes in the benefit obligation and plan assets for Linde's pension and OPEB programs, including reconciliation of the funded status of the plans to amounts recorded in the consolidated balance sheet, as of December 31, 2021 and 2020 are shown below.

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(Millions of dollars) Year Ended December 31,	Pensions				OPEB	
	2021		2020			
	U.S.	Non-U.S.	U.S.	Non-U.S.	2021	2020
Change in Benefit Obligation ("PBO")						
Benefit obligation, January 1	$ 2,746	$ 9,987	$ 2,552	$ 8,689	$ 172	$ 192
Service cost	37	118	37	113	2	2
Interest cost	46	105	68	140	3	5
Divestitures	—	(13)	—	—	—	—
Participant contributions	—	19	—	18	11	11
Plan amendment	—	—	—	7	—	(13)
Actuarial loss (gain)	(94)	(209)	250	893	(8)	(2)
Benefits paid	(145)	(331)	(152)	(320)	(23)	(22)
Plan settlement	(7)	(13)	(9)	(14)	—	—
Plan curtailment	—	—	—	(1)	—	—
Foreign currency translation and other changes	—	(286)	—	462	—	(1)
Benefit obligation, December 31	$ 2,583	$ 9,377	$ 2,746	$ 9,987	$ 157	$ 172
Accumulated benefit obligation ("ABO")	$ 2,503	$ 9,278	$ 2,646	$ 9,830		
Change in Plan Assets						
Fair value of plan assets, January 1	$ 2,310	$ 7,653	$ 2,048	$ 6,888	$ —	$ —
Actual return on plan assets	281	728	386	641	—	—
Company contributions		42	25	66	—	—
Participant contributions	—	19	—	18	—	—
Benefits paid from plan assets	(143)	(272)	(149)	(267)	—	—
Divestitures	—	(14)	—	—	—	—
Foreign currency translation and other changes	—	(188)	—	307	—	—
Fair value of plan assets, December 31	$ 2,448	$ 7,968	$ 2,310	$ 7,653	$ —	$ —
Funded Status, End of Year	$ (135)	$ (1,409)	$ (436)	$ (2,334)	$ (157)	$ (172)
Recorded in the Balance Sheet (Note 7)						
Other long-term assets	$ 15	$ 124	$ 2	$ 53	$ —	$ —
Other current liabilities	(12)	(12)	(9)	(13)	(14)	(12)
Other long-term liabilities	(138)	(1,521)	(429)	(2,374)	(143)	(160)
Net amount recognized, December 31	$ (135)	$ (1,409)	$ (436)	$ (2,334)	$ (157)	$ (172)
Amounts recognized in accumulated other comprehensive income (loss) consist of:						
Net actuarial loss (gain)	$ 383	$ 1,075	$ 687	$ 1,766	$ (16)	$ (11)
Prior service cost (credit)	—	6	—	9	(13)	(15)
Deferred tax benefit (Note 7)	(96)	(217)	(182)	(383)	8	5
Amount recognized in accumulated other comprehensive income (loss) (Note 7)	$ 287	$ 864	$ 505	$ 1,392	$ (21)	$ (21)

Comparative funded status information as of December 31, 2021 and 2020 for select non-U.S. pension plans is presented in the table below as the benefit obligations of these plans are considered to be significant relative to the total benefit obligation:

(Millions of dollars)	United Kingdom 2021	Germany 2021	Other Non-U.S. 2021	Total Non-U.S. 2021
Benefit obligation, December 31	$ 5,879	$ 2,240	$ 1,258	$ 9,377
Fair value of plan assets, December 31	5,577	1,359	1,032	7,968
Funded Status, End of Year	$ (302)	$ (881)	$ (226)	$ (1,409)

(Millions of dollars)	United Kingdom 2020	Germany 2020	Other Non-U.S. 2020	Total Non-U.S. 2020
Benefit obligation, December 31	$ 6,012	$ 2,582	$ 1,393	$ 9,987
Fair value of plan assets, December 31	5,355	1,258	1,040	7,653
Funded Status, End of Year	$ (657)	$ (1,324)	$ (353)	$ (2,334)

The changes in plan assets and benefit obligations recognized in other comprehensive income in 2021 and 2020 are as follows:

	Pensions		OPEB	
(Millions of dollars)	2021	2020	2021	2020
Current year net actuarial losses (gains)*	$ (779)	$ 598	$ (8)	$ (2)
Amortization of net actuarial gains (losses)	(173)	(89)	3	2
Plan amendment	—	7	—	(13)
Amortization of prior service credits (costs)	(3)	(1)	2	2
Pension settlements	(4)	(6)	—	—
Curtailments	—	(1)	—	—
Foreign currency translation and other changes	(39)	87	—	(1)
Total recognized in other comprehensive income	$ (998)	$ 595	$ (3)	$ (12)

* Pension net actuarial gains in 2021 are largely driven by an increase in the actual return on assets during the year and favorability generated from a lower PBO due to an increase in discount rates. In 2020, the low discount rate environment resulted in actuarial losses from a higher PBO and outweighed favorable plan asset experience for both the non-U.S. and U.S. plans.

The following table provides information for pension plans where the accumulated benefit obligation exceeds the fair value of plan assets:

	Pensions			
	2021		2020	
(Millions of dollars) **Year Ended December 31,**	**U.S.**	**Non-U.S.**	**U.S.**	**Non-U.S.**
Accumulated benefit obligation ("ABO")	$ 2,387	$ 8,404	$ 2,518	$ 8,694
Fair value of plan assets	$ 2,317	$ 6,947	$ 2,180	$ 6,254

The following table provides information for pension plans where the projected benefit obligation exceeds the fair value of plan assets:

(Millions of dollars) **Year Ended December 31,**	**Pensions 2021 U.S.**	**Pensions 2021 Non-U.S.**	**Pensions 2020 U.S.**	**Pensions 2020 Non-U.S.**
Projected benefit obligation ("PBO")	$ 2,467	$ 8,499	$ 2,618	$ 8,845
Fair value of plan assets	$ 2,317	$ 6,964	$ 2,180	$ 6,282

Assumptions

The assumptions used to determine benefit obligations are as of the respective balance sheet dates and the assumptions used to determine net benefit cost are as of the previous year-end, as shown below:

	Pensions U.S. 2021	**Pensions U.S. 2020**	**Pensions Non-U.S. 2021**	**Pensions Non-U.S. 2020**	**OPEB 2021**	**OPEB 2020**
Weighted average assumptions used to determine benefit obligations at December 31,						
Discount rate	2.78 %	2.40 %	1.82 %	1.36 %	2.85 %	2.39 %
Interest crediting rate	2.06 %	1.57 %	1.03 %	1.01 %	N/A	N/A
Rate of increase in compensation levels	3.25 %	3.25 %	2.55 %	2.55 %	N/A	N/A
Weighted average assumptions used to determine net periodic benefit cost for years ended December 31,						
Discount rate	2.40 %	3.20 %	1.36 %	1.91 %	2.39 %	3.19 %
Interest crediting rate	1.57 %	2.19 %	1.01 %	1.08 %	N/A	N/A
Rate of increase in compensation levels	3.25 %	3.25 %	2.55 %	2.46 %	N/A	N/A
Expected long-term rate of return on plan assets (1)	7.00 %	7.00 %	5.28 %	5.31 %	N/A	N/A

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(1) The expected long term rate of return on the U.S. and non-U.S. plan assets is estimated based on the plans' investment strategy and asset allocation, historical capital market performance and, to a lesser extent, historical plan performance. For the U.S. plans, the expected rate of return of 7.00% was derived based on the target asset allocation of 40%-60% equity securities (approximately 7.7% expected return), 30%-50% fixed income securities (approximately 5.4% expected return) and 5%-15% alternative investments (approximately 6.3% expected return). For the non-U.S. plans, the expected rate of return was derived based on the weighted average target asset allocation of 15%-25% equity securities (approximately 6.4% expected return), 30%-50% fixed income securities (approximately 5.2% expected return), and 30%-50% alternative investments (approximately 5% expected return). For the U.S. plan assets, the actual annualized total return for the most recent 10-year period ended December 31, 2021 was approximately 10.8%. For the non-U.S. plan assets, the actual annualized total return for the same period was approximately 9.0%. Changes to plan asset allocations and investment strategy over this time period limit the value of historical plan performance as a factor in estimating the expected long term rate of return. For 2022, the expected long-term rate of return on plan assets will be 7.00% for the U.S. plans. For 2022, the expected weighted average long-term rate of return for non-U.S. plans will be 5.54%.

Assumed healthcare cost trend rates	OPEB	
	2021	**2020**
Healthcare cost trend assumed	7.00 %	6.50 %
Rate to which the cost trend rate is assumed to decline (the ultimate trend rate)	5.00 %	5.00 %
Year that the rate reaches the ultimate trend rate	2030	2027

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Pension Plan Assets

The investments of the U.S. pension plan are managed to meet the future expected benefit liabilities of the plan over the long term by investing in diversified portfolios consistent with prudent diversification and historical and expected capital market returns. Investment strategies are reviewed by management and investment performance is tracked against appropriate benchmarks. There are no concentrations of risk as it relates to the assets within the plans. The non-U.S. pension plans are managed individually based on diversified investment portfolios, with different target asset allocations that vary for each plan. Weighted-average asset allocations at December 31, 2021 and 2020 for Linde's U.S. and non-U.S. pension plans, as well as respective asset allocation ranges by major asset category, are generally as follows:

	U.S.				Non-U.S.			
Asset Category	**Target 2021**	**Target 2020**	**2021**	**2020**	**Target 2021**	**Target 2020**	**2021**	**2020**
Equity securities	40%-60%	40%-60%	66 %	66 %	15%-25%	15%-25%	27 %	27 %
Fixed income securities	30%-50%	30%-50%	25 %	27 %	30%-50%	30%-50%	35 %	34 %
Other	5%-15%	5%-15%	9 %	7 %	30%-50%	30%-50%	38 %	39 %

The following table summarizes pension assets measured at fair value by asset category at December 31, 2021 and 2020. For the twelve months ended December 31, 2021, transfers of assets were not material. For the twelve months ended December 31, 2020, transfers of assets of $15 million into Level 3 include insurance contract and real estate investments of $11 million and $4 million, respectively, which were reclassified as there is no active market quotation available. See Note 13 for the definition of levels within the fair value hierarchy:

	Fair Value Measurements Using							
	Level 1		**Level 2**		**Level 3 ****		**Total**	
(Millions of dollars)	**2021**	**2020**	**2021**	**2020**	**2021**	**2020**	**2021**	**2020**
Cash and cash equivalents	$ 259	$ 524	$ —	$ —	$ —	$ —	$ 259	$ 524
Equity securities:								
Global equities	1,633	1,974	—	—	—	—	1,633	1,974
Mutual funds	314	324	—	—	—	—	314	324
Fixed income securities:								
Government bonds	—	—	1,624	1,545	—	—	1,624	1,545
Emerging market debt	—	—	509	520	—	—	509	520
Mutual funds	121	123	12	12	—	—	133	135
Corporate bonds	—	—	647	573	—	—	647	573
Bank loans	—	—	253	242	—	—	253	242
Alternative investments:								
Real estate funds	—	—	—	—	360	335	360	335
Private debt	—	—	—		1,368	1,120	1,368	1,120
Insurance contracts	—	—	—	—	12	11	12	11
Liquid alternative	—	—	1,193	1,083	—	—	1,193	1,083
Other investments	1	—	58	60	—	—	59	60
Total plan assets at fair value, December 31,	$ 2,328	$ 2,945	$ 4,296	$ 4,035	$ 1,740	$ 1,466	$ 8,364	$ 8,446
Pooled funds *							2,052	1,517
Total fair value plan assets December 31,							$ 10,416	$ 9,963

* Pooled funds are measured using the net asset value ("NAV") as a practical expedient for fair value as permissible under the accounting standard for fair value measurements and have not been categorized in the fair value hierarchy.

** The following table summarizes changes in fair value of the pension plan assets classified as level 3 for the periods ended December 31, 2021 and 2020:

(Millions of dollars)	Insurance Contracts	Real Estate Funds	Private Debt	Total
Balance, December 31, 2019	$ —	$ 316	$ 1003	$ 1319
Gain/(Loss) for the period	—	(10)	4	(6)
Purchases	—	21	137	158
Sales	—	(10)	(69)	(79)
Transfer into/ (out of) Level 3	11	4	—	15
Foreign currency translation	—	14	45	59
Balance, December 31, 2020	11	335	1,120	1,466
Gain/(Loss) for the period	1	27	28	56
Purchases	—	13	289	302
Sales	—	(4)	(42)	(46)
Transfer into / (out of) Level 3	1	(1)	—	—
Foreign currency translation	(1)	(10)	(27)	(38)
Balance, December 31, 2021	$ 12	$ 360	$ 1,368	$ 1,740

The descriptions and fair value methodologies for the company's pension plan assets are as follows:

Cash and Cash Equivalents – This category includes cash and short-term interest bearing investments with maturities of three months or less. Investments are valued at cost plus accrued interest. Cash and cash equivalents are classified within level 1 of the valuation hierarchy.

Equity Securities – This category is comprised of shares of common stock in U.S. and non-U.S. companies from a diverse set of industries and size. Common stock is valued at the closing market price reported on a U.S. or non-U.S. exchange where the security is actively traded. Equity securities are classified within level 1 of the valuation hierarchy.

Mutual Funds – These categories consist of publicly and privately managed funds that invest primarily in marketable equity and fixed income securities. The fair value of these investments is determined by reference to the net asset value of the underlying securities of the fund. Shares of publicly traded mutual funds are valued at the net asset value quoted on the exchange where the fund is traded and are primarily classified as level 1 within the valuation hierarchy.

Emerging Market Debt - This category includes fixed income debt issued by countries with developing economies as well as by corporations within those nations. They typically have higher yields but lower credit ratings relative to developed country corporate and government bonds. The fair values for these investments are classified as level 2 within the valuation hierarchy.

U.S. and Non-U.S. Government Bonds – This category includes U.S. treasuries, U.S. federal agency obligations and non-U.S. government debt. The majority of these investments do not have quoted market prices available for a specific government security and so the fair value is determined using quoted prices of similar securities in active markets and is classified as level 2 within the valuation hierarchy.

Corporate Bonds – This category is comprised of corporate bonds of U.S. and non-U.S. companies from a diverse set of industries and size. The fair values for U.S. and non-U.S. corporate bonds are determined using quoted prices of similar securities in active markets and observable data or broker or dealer quotations. The fair values for these investments are classified as level 2 within the valuation hierarchy.

Pooled Funds - Pooled fund NAVs are provided by the trustee and are determined by reference to the fair value of the underlying securities of the trust, less its liabilities, which are valued primarily through the use of directly or indirectly observable inputs. Depending on the pooled fund, underlying securities may include marketable equity securities or fixed income securities.

Bank Loans - This category is comprised of traded syndicated loans of larger corporate borrowers. Such loans are issued by sub-investment grade rated companies both in the U.S. and internationally and are syndicated by investment banks to institutional investors. They are regularly traded in an active dealer market comprised of large investment banks, which supply bid and offer quotes and are therefore classified within level 2 of the valuation hierarchy.

Liquid Alternative Investments - This category is comprised of investments in alternative mutual funds whose holdings include liquid securities, cash, and derivatives. Such funds focus on diversification and employ a variety of investing strategies including long/short equity, multi-strategy, and global macro. The fair value of these investments is determined by reference to the net asset value of the underlying holdings of the fund, which can be determined using observable data (e.g., indices, yield curves, quoted prices of similar securities), and is classified within level 2 of the valuation hierarchy.

Insurance Contracts – This category is comprised of purchased annuity insurance contracts (annuity contract buy-ins) and is intended to mitigate the Company's exposure to certain risks, such as longevity risk. The fair value is calculated based on the cash surrender value of the purchased annuity insurance contract, which is determined based on such factors as the fair value of the underlying assets and discounted cash flows. These contracts are with highly rated insurance companies. Insurance contracts are classified within level 3 of the valuation hierarchy.

Real Estate Funds – This category includes real estate properties, partnership equities and investments in operating companies. The fair value of the assets is determined using discounted cash flows by estimating an income stream for the property plus a reversion into a present value at a risk adjusted rate. Yield rates and growth assumptions utilized are derived from market transactions as well as other financial and industry data. The fair value for these investments are classified within level 3 of the valuation hierarchy.

Private Debt - This category includes non-traded, privately-arranged loans between one or a small group of private debt investment managers and corporate borrowers, which are typically too small to access the syndicated market and have no credit rating. This category also includes similar loans to real estate companies or individual properties. Loans included in this category are valued at par value, are held to maturity or to call, and are classified within level 3 of the valuation hierarchy.

Contributions

At a minimum, Linde contributes to its pension plans to comply with local regulatory requirements (e.g., ERISA in the United States). Discretionary contributions in excess of the local minimum requirements are made based on many factors, including long-term projections of the plans' funded status, the economic environment, potential risk of overfunding, pension insurance costs and alternative uses of the cash. Changes to these factors can impact the timing of discretionary contributions from year to year. Pension contributions were $42 million in 2021, $91 million in 2020 and $94 million in 2019. Estimated required contributions for 2022 are currently expected to be in the range of $40 million to $50 million.

Estimated Future Benefit Payments

The following table presents estimated future benefit payments, net of participant contributions:

(Millions of dollars)	**Pensions**		
Year Ended December 31,	**U.S.**	**Non-U.S.**	**OPEB**
2022	$ 183	$ 348	$ 14
2023	155	346	11
2024	149	357	11
2025	152	366	10
2026	150	388	9
2027-2031	763	1,952	41

NOTE 17. COMMITMENTS AND CONTINGENCIES

The company accrues non income-tax liabilities for contingencies when management believes that a loss is probable and the amounts can be reasonably estimated, while contingent gains are recognized only when realized. In the event any losses are sustained in excess of accruals, they will be charged against income at that time. Attorney fees are recorded as incurred. Commitments represent obligations, such as those for future purchases of goods or services, that are not yet recorded on the company's balance sheet as liabilities. The company records liabilities for commitments when incurred (i.e., when the goods or services are received).

Contingent Liabilities

Linde is subject to various lawsuits and government investigations that arise from time to time in the ordinary course of business. These actions are based upon alleged environmental, tax, antitrust and personal injury claims, among others. Linde has strong defenses in these cases and intends to defend itself vigorously. It is possible that the company may incur losses in connection with some of these actions in excess of accrued liabilities. Management does not anticipate that in the aggregate such losses would have a material adverse effect on the company's consolidated financial position or liquidity; however, it is possible that the final outcomes could have a significant impact on the company's reported results of operations in any given period.

Significant matters are:

- During 2009, the Brazilian government published Law 11941/2009 instituting a new voluntary amnesty program ("Refis Program") which allowed Brazilian companies to settle certain federal tax disputes at reduced amounts. During 2009, the company decided that it was economically beneficial to settle many of its outstanding federal tax disputes and such disputes were enrolled in the Refis Program, subject to final calculation and review by the Brazilian federal government. The company recorded estimated liabilities based on the terms of the Refis Program. Since 2009, Linde has been unable to reach final agreement on the calculations and initiated litigation against the government in an attempt to resolve certain items. Open issues relate to the following matters: (i) application of cash deposits and net operating loss carryforwards to satisfy obligations and (ii) the amount of tax reductions available under the Refis Program. It is difficult to estimate the timing of resolution of legal matters in Brazil.
- At December 31, 2021 the most significant non-income and income tax claims in Brazil, after enrollment in the Refis Program, relate to state VAT tax matters and a federal income tax matter where the taxing authorities are challenging the tax rate that should be applied to income generated by a subsidiary company. The total estimated exposure relating to such claims, including interest and penalties, as appropriate, is approximately $200 million. Linde has not recorded any liabilities related to such claims based on management judgments, after considering judgments and opinions of outside counsel. Because litigation in Brazil historically takes many years to resolve, it is very difficult to estimate the timing of resolution of these matters; however, it is possible that certain of these matters may be resolved within the near term. The company is vigorously defending against the proceedings.
- On September 1, 2010, CADE (Brazilian Administrative Council for Economic Defense) announced alleged anticompetitive activity on the part of five industrial gas companies in Brazil and imposed fines. Originally, CADE imposed a civil fine of $2.2 billion Brazilian reais ($395 million) on White Martins, the Brazil-based subsidiary of Linde Inc. The fine was reduced to $1.7 billion Brazilian reais ($305 million) due to a calculation error made by CADE. The fine against White Martins was overturned by the Ninth Federal Court of Brasilia. CADE appealed this decision, and the Federal Court of Appeals rejected CADE's appeal and confirmed the decision of the Ninth Federal Court of Brasilia. CADE has filed an appeal with the Superior Court of Justice and a decision is pending.

  Similarly, on September 1, 2010, CADE imposed a civil fine of $237 million Brazilian reais ($43 million) on Linde Gases Ltda., the former Brazil-based subsidiary of Linde AG, which was divested to MG Industries GmbH on March 1, 2019 and with respect to which Linde provided a contractual indemnity. The fine was reduced to $188 million Brazilian reais ($34 million) due to a calculation error made by CADE. The fine against Linde Gases Ltda. was overturned by the Seventh Federal Court in Brasilia. CADE appealed this decision, and the Federal Court of Appeals rejected CADE's appeal and confirmed the decision of the Seventh Federal Court of Brasilia. CADE filed an appeal with the Superior Court of Justice, and a final decision is pending.

Linde has strong defenses and is confident that it will prevail on appeal and have the fines overturned. Linde strongly believes that the allegations of anticompetitive activity against our current and former Brazilian subsidiaries are not supported by valid and sufficient evidence. Linde believes that this decision will not stand up to judicial review and deems the possibility of cash outflows to be extremely unlikely. As a result, no reserves have been recorded as management does not believe that a loss from this case is probable.

- On and after April 23, 2019 former shareholders of Linde AG filed appraisal proceedings at the District Court (Landgericht) Munich I (Germany), seeking an increase of the cash consideration paid in connection with the previously completed cash merger squeeze-out of all of Linde AG's minority shareholders for €189.46 per share. Any such increase would apply to all 14,763,113 Linde AG shares that were outstanding on April 8, 2019, when the cash merger squeeze-out was completed. The period for plaintiffs to file claims expired on July 9, 2019. The company believes the consideration paid was fair and that the claims lack merit, and no reserve has been established. We cannot estimate the timing of resolution.

Commitments

At December 31, 2021, Linde had undrawn outstanding letters of credit, bank guarantees and surety bonds valued at approximately $3,695 million from financial institutions. These relate primarily to customer contract performance guarantees (including plant construction in connection with certain on-site contracts), self-insurance claims and other commercial and governmental requirements, including non-U.S. litigation matters.

Other commitments related to leases, tax liabilities for uncertain tax positions, long-term debt, other post retirement and pension obligations are summarized elsewhere in the financial statements (see Notes 4, 5, 11, and 16).

NOTE 18. SEGMENT INFORMATION

Linde's operations consist of two major product lines: industrial gases and engineering. As further described in the following paragraph, Linde's industrial gases operations are managed on a geographic basis, which represent three of the company's reportable segments - Americas, EMEA (Europe/Middle East/Africa), and APAC (Asia/South Pacific); a fourth reportable segment which represents the company's Engineering business, designs and manufactures equipment for air separation and other industrial gas applications specifically for end customers and is managed on a worldwide basis operating in all three geographic segments. Other consists of corporate costs and a few smaller businesses which individually do not meet the quantitative thresholds for separate presentation.

The industrial gases product line centers on the manufacturing and distribution of atmospheric gases (oxygen, nitrogen, argon, rare gases) and process gases (carbon dioxide, helium, hydrogen, electronic gases, specialty gases, acetylene). Many of these products are co-products of the same manufacturing process. Linde manufactures and distributes nearly all of its products and manages its customer relationships on a regional basis. Linde's industrial gases are distributed to various end-markets within a regional segment through one of three basic distribution methods: on-site or tonnage; merchant or bulk; and packaged or cylinder gases. The distribution methods are generally integrated in order to best meet the customer's needs and very few of its products can be economically transported outside of a region. Therefore, the distribution economics are specific to the various geographies in which the company operates and are consistent with how management assesses performance.

The company's measure of profit/loss for segment reporting is segment operating profit. Segment operating profit is defined as operating profit excluding purchase accounting impacts of the Linde AG merger, intercompany royalties, and items not indicative of ongoing business trends. This is the manner in which the company's CODM assesses performance and allocates resources. Similarly, total assets have not been included as this is not provided to the CODM for their assessment.

The table below presents information about reportable segments for the years ended December 31, 2021, 2020 and 2019.

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(Millions of dollars)	2021	2020	2019
Sales (a)			
Americas	$ 12,103	$ 10,459	$ 10,989
EMEA	7,643	6,449	6,643
APAC	6,133	5,687	5,779
Engineering	2,867	2,851	2,799
Other	2,047	1,797	1,953
Total Segment Sales	30,793	27,243	28,163
Merger-related divestitures	—	—	65
Total Sales	$ 30,793	$ 27,243	$ 28,228

	2021	2020	2019
Segment Operating Profit			
Americas	$ 3,368	$ 2,773	$ 2,577
EMEA	1,889	1,465	1,367
APAC	1,502	1,277	1,184
Engineering	473	435	390
Other	(56)	(153)	(246)
Reported Segment operating profit	7,176	5,797	5,272
Cost reduction programs and other charges (Note 3)	(273)	(506)	(567)
Net gain on sale of business	—	—	164
Purchase accounting impacts - Linde AG	(1,919)	(1,969)	(1,952)
Merger-related divestitures	—	—	16
Total operating profit	$ 4,984	$ 3,322	$ 2,933

	2021	2020	2019
Depreciation and Amortization			
Americas	$ 1,243	$ 1,196	$ 1,195
EMEA	752	723	749
APAC	611	619	613
Engineering	39	36	35
Other	127	132	143
Segment depreciation and amortization	2,772	2,706	2,735
Purchase accounting impacts - Linde AG	1,863	1,920	1,940
Total depreciation and amortization	$ 4,635	$ 4,626	$ 4,675

	2021	2020	2019
Capital Expenditures and Acquisitions			
Americas	$ 1,354	$ 1,425	$ 1,814
EMEA	669	670	738
APAC	995	1,214	1,231
Engineering	25	13	79
Other	131	146	45
Total Capital Expenditures and Acquisitions	$ 3,174	$ 3,468	$ 3,907

	2021	2020	2019
Sales by Major Country			
United States	$ 9,123	$ 8,475	$ 8,604
Germany	3,601	3,740	3,630
China	2,562	2,061	2,005
United Kingdom	2,060	1,595	1,653
Australia	1,307	1,071	1,127
Brazil	1,065	822	994
Other – non-U.S.	11,075	9,479	10,215
Total sales	$ 30,793	$ 27,243	$ 28,228

	2021	2020	2019
Long-lived Assets by Major Country (b)			
United States	$ 7,659	$ 7,777	$ 7,498
Germany	2,003	2,394	2,429
China	2,385	2,413	2,254
United Kingdom	1,078	1,313	1,479
Australia	872	1,105	1,214
Brazil	705	734	956
Other – non-U.S.	11,301	12,976	13,234
Total long-lived assets	$ 26,003	$ 28,711	$ 29,064

(a) Sales reflect external sales only. Intersegment sales, primarily from Engineering to the industrial gases segments, were not material.

(b) Long-lived assets include property, plant and equipment - net.

19. REVENUE RECOGNITION

Revenue is accounted for in accordance with ASC 606. Revenue is recognized as control of goods or services are transferred to customers in an amount that reflects the consideration to which an entity expects to be entitled to receive in exchange for the goods or services.

Contracts with Customers

Linde serves a diverse group of industries including healthcare, energy, manufacturing, food, beverage carbonation, fiber-optics, steel making, aerospace, chemicals and water treatment.

Industrial Gases

Within each of the company’s geographic segments for industrial gases, there are three basic distribution methods: (i) on-site or tonnage; (ii) merchant or bulk liquid; and (iii) packaged or cylinder gases. The distribution method used by Linde to supply a customer is determined by many factors, including the customer’s volume requirements and location. The distribution method generally determines the contract terms with the customer and, accordingly, the revenue recognition accounting practices. Linde's primary products in its industrial gases business are atmospheric gases (oxygen, nitrogen, argon, rare gases) and process gases (carbon dioxide, helium, hydrogen, electronic gases, specialty gases, acetylene). These products are generally sold through one of the three distribution methods.

Following is a description of each of the three industrial gases distribution methods and the respective revenue recognition policies:

On-site. Customers that require the largest volumes of product and that have a relatively constant demand pattern are supplied by cryogenic and process gas on-site plants. Linde constructs plants on or adjacent to these customers’ sites and supplies the product directly to customers by pipeline. Where there are large concentrations of customers, a single pipeline may be connected to several plants and customers. On-site product supply contracts generally are total requirement contracts with terms typically ranging from 10-20 years and contain minimum purchase requirements and price escalation provisions. Many of the cryogenic on-site plants also produce liquid products for the merchant market. Therefore, plants are typically not dedicated to a single customer. Additionally, Linde is responsible for the design, construction, operations and maintenance of the plants and our customers typically have no involvement in these activities. Advanced air separation processes also allow on-site delivery to customers with smaller volume requirements.

The company’s performance obligations related to on-site customers are satisfied over time as customers receive and obtain control of the product. Linde has elected to apply the practical expedient for measuring progress towards the completion of a performance obligation and recognizes revenue as the company has the right to invoice each customer, which generally corresponds with product delivery. Accordingly, revenue is recognized when product is delivered to the customer and the company has the right to invoice the customer in accordance with the contract terms. Consideration in these contracts is generally based on pricing which fluctuates with various price indices. Variable components of consideration exist within on-site contracts but are considered constrained.

Merchant. Merchant deliveries generally are made from Linde's plants by tanker trucks to storage containers at the customer's site. Due to the relatively high distribution cost, merchant oxygen and nitrogen generally have a relatively small distribution radius from the plants at which they are produced. Merchant argon, hydrogen and helium can be shipped much longer distances. The customer agreements used in the merchant business are usually three to seven year supply agreements based on the requirements of the customer. These contracts generally do not contain minimum purchase requirements or volume commitments.

The company’s performance obligations related to merchant customers are generally satisfied at a point in time as the customers receive and obtain control of the product. Revenue is recognized when product is delivered to the customer and the company has the right to invoice the customer in accordance with the contract terms. Any variable components of consideration within merchant contracts are constrained however this consideration is not significant.

Packaged Gases. Customers requiring small volumes are supplied products in containers called cylinders, under medium to high pressure. Linde distributes merchant gases from its production plants to company-owned cylinder filling plants where cylinders are then filled for distribution to customers. Cylinders may be delivered to the customer’s site or picked up by the customer at a packaging facility or retail store. Linde invoices the customer for the industrial gases and the use of the cylinder container(s). The company also sells hardgoods and welding equipment purchased from independent manufacturers. Packaged gases are generally sold under one to three-year supply contracts and purchase orders and do not contain minimum purchase requirements or volume commitments.

The company’s performance obligations related to packaged gases are satisfied at a point in time. Accordingly, revenue is recognized when product is delivered to the customer or when the customer picks up product from a packaged gas facility or retail store, and the company has the right to payment from the customer in accordance with the contract terms. Any variable consideration is constrained and will be recognized when the uncertainty related to the consideration is resolved.

Linde Engineering

The company designs and manufactures equipment for air separation and other industrial gas applications manufactured specifically for end customers. Sale of equipment contracts are generally comprised of a single performance obligation. Revenue from sale of equipment is generally recognized over time as Linde has an enforceable right to payment for performance completed to date and performance does not create an asset with alternative use. For contracts recognized over time, revenue is recognized primarily using a cost incurred input method. Costs incurred to date relative to total estimated costs at completion are used to measure progress toward satisfying performance obligations. Costs incurred include material, labor, and overhead costs and represent work contributing and proportionate to the transfer of control to the customer. Contract modifications are typically accounted for as part of the existing contract and are recognized as a cumulative adjustment for the inception-to-date effect of such change.

Contract Assets and Liabilities

Contract assets and liabilities result from differences in timing of revenue recognition and customer invoicing. Contract assets primarily relate to sale of equipment contracts for which revenue is recognized over time. The balance represents unbilled revenue which occurs when revenue recognized under the measure of progress exceeds amounts invoiced to customers. Customer invoices may be based on the passage of time, the achievement of certain contractual milestones or a combination of both criteria. Contract liabilities include advance payments or right to consideration prior to performance under the contract. Contract liabilities are recognized as revenue as performance obligations are satisfied under contract terms. Linde has contract assets of $134 million at December 31, 2021 and $162 million at December 31, 2020. Total contract liabilities are $3,699 million at December 31, 2021 (current of $2,940 million and $759 million within other long-term liabilities in the consolidated balance sheets). Total contract liabilities were $2,301 million at December 31, 2020 (current contract liabilities of $1,769 million and $532 million within other long-term liabilities in the consolidated balance sheets). Revenue recognized for the twelve months ended December 31, 2021 that was included in the contract liability at December 31, 2020 was $1,173 million. Contract assets and liabilities primarily relate to the Linde Engineering business.

Payment Terms and Other

Linde generally receives payment after performance obligations are satisfied, and customer prepayments are not typical for the industrial gases business. Payment terms vary based on the country where sales originate and local customary payment practices. Linde does not offer extended financing outside of customary payment terms. Amounts billed for sales and use taxes, value-added taxes, and certain excise and other specific transactional taxes imposed on revenue producing transactions are presented on a net basis and are not included in sales within the consolidated statement of income. Additionally, sales returns and allowances are not a normal practice in the industry and are not significant.

Disaggregated Revenue Information

As described above and in Note 18, the company manages its industrial gases business on a geographic basis, while the Engineering and Other businesses are generally managed on a global basis. Furthermore, the company believes that reporting sales by distribution method by reportable geographic segment best illustrates the nature, timing, type of customer, and contract terms for its revenues, including terms and pricing.

The following tables show sales by distribution method at the consolidated level and for each reportable segment and Other for the years ended December 31, 2021, 2020 and 2019.

(Millions of dollars)	Year Ended December 31, 2021						
Sales	**Americas**	**EMEA**	**APAC**	**Engineering**	**Other**	**Total**	**%**
Merchant	$ 3,279	$ 2,227	$ 2,181	$ —	$ 173	$ 7,860	26 %
On-Site	3,225	1,824	2,296	—	—	7,345	24 %
Packaged Gas	5,456	3,539	1,532	—	24	10,551	34 %
Other	143	53	124	2,867	1,850	5,037	16 %
	$ 12,103	$ 7,643	$ 6,133	$ 2,867	$ 2,047	$ 30,793	100 %

(Millions of dollars)	Year Ended December 31, 2020						
Sales	**Americas**	**EMEA**	**APAC**	**Engineering**	**Other**	**Total**	**%**
Merchant	$ 2,839	$ 1,870	$ 2,005	$ —	$ 145	$ 6,859	25 %
On-Site	2,513	1,354	2,049	—	—	5,916	22 %
Packaged Gas	5,034	3,175	1,559	—	22	9,790	36 %
Other	73	50	74	2,851	1,630	4,678	17 %
	$ 10,459	$ 6,449	$ 5,687	$ 2,851	$ 1,797	$ 27,243	100 %

(Millions of dollars)	Year Ended December 31, 2019						
Sales	**Americas**	**EMEA**	**APAC**	**Engineering**	**Other (a)**	**Total**	**%**
Merchant	$ 2,945	$ 1,856	$ 2,080	$ —	$ 184	$ 7,065	25 %
On-Site	2,757	1,434	2,020	—	—	6,211	22 %
Packaged Gas	5,183	3,347	1,542	—	19	10,091	36 %
Other	104	6	137	2,799	1,815	4,861	17 %
	$ 10,989	$ 6,643	$ 5,779	$ 2,799	$ 2,018	$ 28,228	100 %

(a) Other includes $65 million for the year ended December 31, 2019 of merger-related divestitures that have been excluded from segment sales.

Remaining Performance Obligations

As described above, Linde's contracts with on-site customers are under long-term supply arrangements which generally require the customer to purchase their requirements from Linde and also have minimum purchase requirements. The company estimates the consideration related to minimum purchase requirements is approximately $57 billion. This amount excludes all sales above minimum purchase requirements, which can be significant depending on customer needs. In the future, actual amounts will be different due to impacts from several factors, many of which are beyond the company's control including, but not limited to, timing of newly signed, terminated and renewed contracts, inflationary price escalations, currency exchange rates, and pass-through costs related to natural gas and electricity. The actual duration of long-term supply contracts ranges up to twenty years. The company estimates that approximately half of the revenue related to minimum purchase requirements will be earned in the next five years and the remaining thereafter.

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

None.

ITEM 9A. CONTROLS AND PROCEDURES

Conclusion Regarding the Effectiveness of Disclosure Controls and Procedures

Based on an evaluation of the effectiveness of Linde's disclosure controls and procedures, which was made under the supervision and with the participation of management, including Linde's principal executive officer and principal financial officer, the principal executive officer and principal financial officer have each concluded that, as of December 31, 2021, such disclosure controls and procedures are effective in ensuring that information required to be disclosed by Linde in reports that it files or submits under the Exchange Act of 1934 is recorded, processed, summarized and reported within the time periods specified in the Securities and Exchange Commission's rules and forms, and accumulated and communicated to management including Linde's principal executive officer and principal financial officer, to allow timely decisions regarding required disclosure.

Management's Report on Internal Control Over Financial Reporting

Refer to Item 8 for Management's Report on Internal Control Over Financial Reporting as of December 31, 2021.

Changes in Internal Control over Financial Reporting

There were no changes in Linde's internal control over financial reporting that occurred during the quarter ended December 31, 2021 that have materially affected, or are reasonably likely to materially affect, Linde's internal control over financial reporting.

ITEM 9B. OTHER INFORMATION

None.

ITEM 9C. DISCLOSURE REGARDING FOREIGN JURISDICTIONS THAT PREVENT INSPECTIONS

None.

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

Certain information required by this item is incorporated herein by reference to the sections captioned “Corporate Governance and Board Matters - Director Nominees" and “Corporate Governance And Board Matters - "Delinquent Section 16 (a) Reports" in Linde’s Proxy Statement to be filed by April 30, 2022 for the Annual General Meeting.

Identification of the Audit Committee

Linde has a separately-designated standing Audit Committee established in accordance with Section 3(a)(58)(A) of the Securities Exchange Act of 1934 as amended (the “Exchange Act”). The members of that audit committee are Prof. Dr. Clemens Börsig (chairman), Dr. Nance K. Dicciani, Dr. Thomas Enders, Edward G. Galante, Larry D. McVay, Dr. Victoria Ossadnik and Alberto Weisser and each member is independent within the meaning of the independence standards adopted by the Board of Directors and those of the New York Stock Exchange.

Audit Committee Financial Expert

The Linde Board of Directors has determined that Prof. Dr. Clemens Börsig and Alberto Weisser satisfy the criteria adopted by the SEC to serve as “audit committee financial experts” as defined by Item 407(d)(5)(ii) of Regulation S-K of the Exchange Act and is independent within the meaning of the independence standards adopted by the Board of Directors and those of the New York Stock Exchange.

Code of Ethics

Linde has adopted a code of ethics that applies to the company’s directors and all employees, including its Chief Executive Officer, Chief Financial Officer, and Chief Accounting Officer. This code of ethics, including specific standards for implementing certain provisions of the code, has been approved by the Linde Board of Directors and is named the “Code of Business Integrity”. This document is posted on the company’s public website, www.linde.com but is not incorporated herein.

ITEM 11. EXECUTIVE COMPENSATION

Information required by this item is incorporated herein by reference to the sections captioned “Executive Compensation Matters” and “Corporate Governance and Board Matters - Director Compensation” in Linde’s Proxy Statement to be filed by April 30, 2022 for the Annual General Meeting.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

Equity Compensation Plans Information - The table below provides information as of December 31, 2021 about company shares that may be issued upon the exercise of options, warrants and rights granted to employees or members of Linde's Board of Directors under equity compensation plans that were assumed by Linde upon the completion of the business combination on October 31, 2018.

EQUITY COMPENSATION PLANS TABLE

Plan Category	Number of securities to be issued upon exercise of outstanding options, warrants and rights (a)	Weighted-average exercise price of outstanding options, warrants and rights (b)	Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in column (a)) (c)
Equity compensation plans approved by shareholders	8,414,538 (1)	$ 152.57	9,280,823 (2)
Equity compensation plans not approved by shareholders	—	—	—
Total	8,414,538	$ 152.57	9,280,823

(1) This amount includes 636,715 restricted shares and 610,245 performance shares.

(2) This amount includes 8,995,710 shares available for future issuance pursuant to the 2021 Linde plc Long Term Incentive Plan, and 285,113 shares available for future issuance pursuant to the Long Term Incentive Plan 2018 of Linde plc.

Certain information required by this item regarding the beneficial ownership of the company's ordinary shares is incorporated herein by reference to the section captioned "Information on Share Ownership" in Linde's Proxy Statement to be filed by April 30, 2022 for the Annual General Meeting.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS AND DIRECTOR INDEPENDENCE

Information required by this item is incorporated herein by reference to the sections captioned "Corporate Governance And Board Matters – Review, Approval or Ratification of Transactions with Related Persons," "Corporate Governance And Board Matters – Certain Relationships and Transactions," and "Corporate Governance And Board Matters – Director Independence" in Linde's Proxy Statement to be filed by April 30, 2022 for the Annual General Meeting.

ITEM 14. PRINCIPAL ACCOUNTING FEES AND SERVICES

Information required by this item is incorporated herein by reference to the section captioned "Audit Matters" in Linde's Proxy Statement to be filed by April 30, 2022 for the Annual General Meeting.

PART IV

ITEM 15. EXHIBITS, FINANCIAL STATEMENT SCHEDULES

(a) The following documents are filed as part of this report:

(i) The company's 2021 Consolidated Financial Statements and the Report of the Independent Registered Public Accounting Firm are included in Part II, Item 8. Financial Statements and Supplementary Data.

(ii) Financial Statement Schedules – All financial statement schedules have been omitted because they are not applicable or the required information is shown in the financial statements or notes thereto.

(iii) Exhibits – The exhibits filed as part of this Annual Report on Form 10-K are listed in the accompanying index.

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INDEX TO EXHIBITS

Linde plc and Subsidiaries

Exhibit No.	Description
2.1	Business Combination Agreement by and among Linde Aktiengesellschaft, Praxair, Inc., Zamalight PLC, Zamalight Holdco LLC and Zamalight Subco, Inc. dated as of June 1, 2017 (Filed as Exhibit 2.1 to Praxair, Inc.'s Current Report on Form 8-K dated June 1, 2017, Filing No. 1-11037, and is incorporated herein by reference.)
2.1a	Amendment No. 1, dated August 10, 2017, to the Business Combination Agreement, by and among Praxair, Inc., Linde Aktiengesellschaft, Linde plc, Zamalight Holdco LLC and Zamalight Subco, Inc. (Filed as Exhibit 2.1 to Praxair, Inc.'s Current Report on Form 8-K dated August 10, 2017, Filing No. 1-11037, and is incorporated hereby by reference.)
**2.2	Sale and Purchase Agreement, dated July 5, 2018, by and among Praxair, Inc., Taiyo Nippon Sanso Corporation ("Taiyo"), and Linde plc with respect to the sale of a majority of Praxair's businesses in Europe to Taiyo in connection with the Business Combination Agreement (Filed as Exhibit 2.1 to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2018, File No. 1-38730, and is incorporated hereby by reference).
**2.3	Sale and Purchase Agreement, dated July 16, 2018, by and among Linde AG, Praxair, Inc., MG Industries GmbH, Messer Canada Inc., MG Industries USA, Inc. (the MG entities and Messer Canada, Inc. being collectively referred to as "Messer"), and Linde plc with respect to the sale of certain assets of Linde AG in the Americas and certain assets of Praxair, Inc. to Messer in connection with the Business Combination Agreement (Filed as Exhibit 2.2 to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2018, File No. 1-38730, and is incorporated hereby by reference).
**2.3a	First Amendment dated September 21, 2018 to the Sale and Purchase Agreement, dated July 16, 2018, by and among Linde AG, Praxair, Inc., Messer, and Linde plc with respect to the sale of certain additional assets of Linde AG in the Americas to Messer in connection with the Business Combination Agreement (Filed as Exhibit 2.3 to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2018, File No. 1-38730, and is incorporated hereby by reference).
**2.3b	Second Amendment dated October 19, 2018 to the Sale and Purchase Agreement, dated July 16, 2018, as amended by the First Amendment thereto, by and among Linde AG, Praxair, Inc., Messer, and Linde plc, with respect to the sale of certain additional assets of Linde AG in the Americas to Messer in connection with the Business Combination Agreement (Filed as Exhibit 2.2 to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2018, File No. 1-11037, and is incorporated hereby by reference).
**2.3c	Third Amendment dated February 20, 2019 to the Sale and Purchase Agreement, dated July 16, 2018, as amended by the First and Second Amendment thereto, by and among Linde AG, Praxair, Inc., Messer, and Linde plc, with respect to the sale of certain additional assets of Linde AG in the Americas to Messer in connection with the Business Combination Agreement dated as of June 1, 2017, as amended, to effect a combination of the businesses of Linde AG and Praxair, Inc. (Filed as Exhibit 2.4 to the Company's Current Report on Form 8-K, filed on March 7, 2019, File No. 1-11037, and is incorporated hereby by reference).
3.01	Amended and Restated Public Limited Company Constitution of Linde plc (Filed as Exhibit 3.1 to the Company's Current Report on Form 8-K, filed on October 31, 2018, File No. 333-218485, and incorporated herein by reference).
4.01	Description of Linde plc Ordinary Shares (Filed as Exhibit 4.01 to Linde plc's 2019 Annual Report on Form 10-K, Filing No. 1-38730, and incorporated herein by reference).
4.02	Indenture, dated as of July 15, 1992, between Praxair, Inc. and U.S. Bank National Association, as the ultimate successor trustee to Bank of America, Illinois, formerly Continental Bank, National Association (Filed as Exhibit 4 to Praxair, Inc.'s Current Report on Form 8-K dated March 19, 2007, Filing No. 1-11037, and incorporated herein by reference).
4.03	Form of Subordinated Indenture for Praxair, Inc. (Filed as Exhibit 4.3 to Praxair, Inc.'s Form S-3, filed on May 12, 2015, File No. 333-204093, and is incorporated herein by reference.)
4.04	Supplemental Indenture, dated as of September 3, 2019, among Linde plc, Praxair, Inc., Linde AG and U.S. Bank National Association, as trustee (Filed as Exhibit 4.2 to the Linde plc Form 8-K dated September 6, 2019, Filing No. 1-38730, and incorporated herein by reference).
4.05	Guarantee and Negative Pledge of Linde plc dated May 11, 2020 (Filed as Exhibit 4.3 to the Linde plc Form 8-K dated May 26, 2020, Filing No.1-38730, and is incorporated herein by reference).
4.06	Upstream Guarantee to Linde plc provided by Linde GmbH dated May 11, 2020 (Filed as Exhibit 4.4 to the Linde plc Form 8-K dated May 26, 2020, Filing No.1-38730, and incorporated herein by reference).
4.07	Upstream Guarantee to Linde plc provided by Praxair, Inc. dated May 11, 2020 (Filed as Exhibit 4.5 to the Linde plc Form 8-K dated May 26, 2020, Filing No.1-38730, and incorporated herein by reference).

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4.08	Fiscal Agency Agreement, dated May 11, 2020, among Linde plc, as Issuer and as Guarantor, Linde Finance B.V., as Issuer, and Deutsche Bank Aktiengesellschaft, as Fiscal Agent and Paying Agent (Filed as Exhibit 4.6 to the Linde plc Form 8-K dated May 26. 2020, Filing No 1-37830, and incorporated herein by reference).
4.09	Indenture, dated as of August 10, 2020, among Praxair, Inc., Linde plc and U.S. Bank National Association, as trustee (Filed as Exhibit 4.1 to the Linde plc Form 8-K dated August 10, 2020, Filing No. 1-38730, and incorporated herein by reference).
4.10	Amended and Restated Fiscal Agency Agreement, dated August 3, 2021, among Linde plc, as Issuer and as Guarantor, Linde Finance B.V., as Issuer, and Deutsche Bank Aktiengesellschaft, as Fiscal Agent and Paying Agent (Filed as Exhibit 4.6 to Linde plc 's current report on Form 8-K, dated September 30, 2021, Filing No. 1-38730, and incorporated herein by reference).
4.11	Copies of the agreements related to long-term debt which are not required to be filed as exhibits to this Annual Report on Form 10-K will be furnished to the Securities and Exchange Commission upon request.
*10.0e	Form of Non-Employee Director Restricted Stock Unit Award Under the 2021 Linde plc Long Term Incentive Plan is filed herewith
10.01	Credit Agreement dated as of March 26, 2019, among Linde plc, certain of its subsidiaries parties thereto as borrowers, the lenders party thereto and Bank of America, N.A., as Administrative Agent (Filed as Exhibit 10.1 to Linde plc's current report on Form 8-K, dated April 3, 2019, Filing No. 1-38730, and incorporated herein by reference).
10.01a	Credit Agreement Additional Guarantor Supplement, dated as of September 3, 2019, by Linde AG, and acknowledged by Bank of America, N.A., as Administrative Agent (Filed as Exhibit 10.2 to the Linde plc Form 8-K dated September 6, 2019, Filing No. 1-38730, and incorporated herein by reference).
*10.02	2021 Linde plc Long Term Incentive Plan, Effective as of July 26, 2021 (Filed as Exhibit 10.01 to Linde plc's Quarterly Report on Form 10-Q for the quarter ended June 30, 2021, Filing No. 1-38730, and incorporated herein by reference.).
*10.02a	Form of Transferable Stock Option Award Under the 2021 Linde plc Long Term Incentive Plan (Filed as Exhibit 10.01 to Linde plc's Quarterly Report on Form 10-Q for the quarter ended September 30, 2021, Filing No. 1-38730, and incorporated herein by reference).
*10.02b	Form of Restricted Stock Unit Award Under the Linde plc Long Term Incentive Plan (Filed as Exhibit 10.02 to Linde plc's Quarterly Report on Form 10-Q for the quarter ended September 30, 2021, Filing No. 1-38730, and incorporated herein by reference).
*10.02c	Form of Performance Share Unit Award Under the 2021 Linde plc Long Term Incentive Plan with Return on Capital performance metrics (Filed as Exhibit 10.03 to Linde plc's Quarterly Report on Form 10-Q for the quarter ended September 30, 2021, Filing No. 1-38730, and incorporated herein by reference).
*10.02d	Form of Performance Share Unit Award Under the 2021 Linde plc Long Term Incentive Plan with Total Shareholder Return performance metrics (Filed as Exhibit 10.04 to Linde plc's Quarterly Report on Form 10-Q for the quarter ended September 30, 2021, Filing No. 1-38730, and incorporated herein by reference).
*10.03	Long Term Incentive Plan 2018 of Linde plc (Filed as Exhibit 4.4 to the Company's Form S-8, filed on October 31, 2018, File No. 333-228084, and incorporated herein by reference).
*10.04	Linde plc Annual Variable Compensation Plan effective January 1, 2019 (Filed as Exhibit 10.1 to the Company's Current Report on Form 8-K, filed on January 25, 2019, File No. 1-38730, and is incorporated hereby by reference).
*10.05	Praxair, Inc. Supplemental Retirement Income Plan A effective January 1, 2008 (Filed as Exhibit 10.05a to Praxair, Inc.'s 2008 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.05a	First amendment to the Praxair, Inc. Supplemental Retirement Income Plan A effective January 1, 2010 (Filed as Exhibit 10.05b to Praxair, Inc.'s 2009 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.05b	Second Amendment to Praxair, Inc. Supplemental Retirement Income Plan A effective February 28, 2017, (Filed as Exhibit 10.05c to Praxair, Inc.'s 2016 Annual Report on Form 10-K, Filing No. 1-11037, and is incorporated hereby by reference).
*10.05c	Third Amendment to the Praxair, Inc. Supplemental Retirement Income Plan A effective December 1, 2017 (Filed as Exhibit 10.05m to Praxair, Inc.'s 2017 Annual Report on Form 10-K, File No. 1-11037, and is incorporated herein by reference).
*10.05d	Praxair, Inc. Supplemental Retirement Income Plan B amended and restated effective December 31, 2007 (Filed as Exhibit 10.05b to Praxair, Inc.'s 2008 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).

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*10.05e	First amendment to the Praxair, Inc. Supplemental Retirement Income Plan B effective January 1, 2010 (Filed as Exhibit 10.05d to Praxair, Inc.'s 2009 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.05f	Second Amendment to Praxair, Inc. Supplemental Retirement Income Plan B effective July 1, 2012 (Filed as Exhibit 10.05e to Praxair Inc.'s 2012 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.05g	Third Amendment to Praxair, Inc. Supplemental Retirement Income Plan B effective February 28, 2017, (Filed as Exhibit 10.05g to Praxair, Inc.'s 2016 Annual Report on Form 10-K, Filing No. 1-11037, and is incorporated herein by reference).
*10.05h	Fourth Amendment to the Praxair, Inc. Supplemental Retirement Income Plan B effective December 1, 2017 (Filed as Exhibit 10.05l to Praxair, Inc.'s 2017 Annual Report on Form 10-K, File No. 1-11037, and is incorporated herein by reference).
*10.06	Praxair, Inc. Equalization Benefit Plan amended and restated effective December 31, 2007 (Filed as Exhibit 10.05c to Praxair, Inc.'s 2008 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.06a	First amendment to the Praxair, Inc. Equalization Benefit Plan effective January 1, 2010 (Filed as Exhibit 10.05f to Praxair Inc.'s 2009 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.06b	Second Amendment to the Praxair, Inc. Equalization Benefit Plan effective February 28, 2017,(Filed as Exhibit 10.05j to Praxair, Inc.'s 2016 Annual Report on Form 10-K, Filing No. 1-11037, and is incorporated herein by reference).
*10.06c	Third Amendment to the Praxair, Inc. Equalization Benefit Plan effective December 1, 2017 (Filed as Exhibit 10.05k to Praxair, Inc.'s 2017 Annual Report on Form 10-K, File No. 1-11037, and is incorporated herein by reference).
*10.06d	Linde Inc. 2018 Equalization Benefit Plan, Amended and Restated effective September 1, 2020 (Filed as Exhibit 10.5 to Linde plc's Quarterly Report on Form 10-Q for the quarter ended September 30, 2020, Filing No. 1-38730, and incorporated herein by reference).
*10.06e	Linde Inc. 2018 Supplemental Retirement Income Plan A, Amended and Restated effective September 1, 2020 (Filed as Exhibit 10.3 to Linde plc's Quarterly Report on Form 10-Q for the quarter ended September 30, 2020, Filing No. 1-38730, and incorporated herein by reference).
*10.06f	Linde Inc. 2018 Supplemental Retirement Income Plan B, Amended and Restated effective September 1, 2020 (Filed as Exhibit 10.4 to Linde plc's Quarterly Report on Form 10-Q for the quarter ended September 30, 2020, Filing No. 1-38730, and incorporated herein by reference).
*10.07	Praxair, Inc. Director's Fees Deferral Plan amended and restated effective January 26, 2010 (Filed as Exhibit 10.06 to Praxair Inc.'s 2009 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.08	Linde Compensation Deferral Program Amended and Restated effective September 1, 2020 (Filed as Exhibit 10.2 to Linde plc's Quarterly Report on Form 10-Q for the quarter ended September 30, 2020. Filing No. 1-38730, and incorporated herein by reference).
*10.09	First Amendment to the Linde Compensation Deferral Program effective April 1, 2021. (Filed as Exhibit 10.01 to Linde plc's Quarterly Report on Form 10-Q for the quarter ended March 31, 2021. Filing No. 1-38730 and incorporated herein by reference).
*10.10	Service Credit Arrangement for Stephen F. Angel dated May 23, 2007 was filed as Exhibit 10.20 to Praxair, Inc.'s Form 8-K filed on May 24, 2007 and is incorporated herein by reference.
*10.11	Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan (Filed as Exhibit 4.03 to Praxair, Inc.'s Form S-8, filed on October 31, 2018, File No. 333-228084, and incorporated herein by reference).
*10.11a	First Amendment, dated as of April 25, 2017, to the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan (Filed as Exhibit 10.01 to Praxair, Inc.'s Quarterly Report on Form 10-Q for the quarter ended March 31, 2017, Filing No. 1-11037, and is incorporated herein by reference).
*10.11b	Second Amendment dated September 8, 2020 to the Amended and Restated 2009 Praxair, Inc Long Term Incentive Plan (Filed as Exhibit 10.1 to Linde plc's Quarterly Report on Form 10-Q for the quarter ended September 30, 2020, Filing No. 1-38730, and incorporated herein by reference).
*10.11c	Form of Standard Option Award under the 2009 Praxair, Inc. Long Term Incentive Plan (Filed as Exhibit 10.22 to Praxair, Inc.'s 2009 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).

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*10.11d	Form of Transferable Option Award under the 2009 Praxair, Inc. Long Term Incentive Plan (Filed as Exhibit 10.23 to Praxair, Inc.'s 2009 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.11e	Form of Transferable Option Award under the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan for grants made in 2015-2017 (Filed as Exhibit 10.26 to Praxair, Inc.'s 2014 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.11f	Form of Transferable Option Award under the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan for grants made in 2018 (Filed as Exhibit 10.26a to Praxair, Inc.'s 2017 Annual Report on Form 10-K, File No. 1-11037, and incorporated herein by reference).
*10.11g	Form of Restricted Stock Unit Award under the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan for grants made in 2018 (Filed as Exhibit 10.27a to Praxair, Inc.'s 2017 Annual Report on Form 10-K, File No. 1-11037, and incorporated herein by reference).
*10.11h	Form of Non-Employee Director Restricted Stock Unit Award under the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan for grants made in 2019 and thereafter (Filed as Exhibit 10.10i to Linde plc's 2019 Annual Report on Form 10-K, Filing No. 1-38730, and incorporated herein by reference).
*10.11i	Form of Transferable Option Award under the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan for grants beginning in 2019 (Filed as Exhibit 10.11L to Linde plc's 2018 Annual Report on Form 10-K, Filing No. 1-38730, and incorporated herein by reference).
*10.11j	Form of Restricted Stock Unit Award under the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan for grants beginning in 2019 (Filed as Exhibit 10.11M to Linde plc's 2018 Annual Report on Form 10-K, Filing No. 1-38730, and incorporated herein by reference).
*10.11k	Form of Performance Share Unit Award under the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan for grants beginning in 2019 with Return on Capital performance metrics (Filed as Exhibit 10.11N to Linde plc's 2018 Annual Report on Form 10-K, Filing No. 1-38730, and incorporated herein by reference).
*10.11l	Form of Performance Share Unit Award under the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan for grants beginning in 2019 with Total Shareholder Return performance metrics (Filed as Exhibit 10.11O to Linde plc's 2018 Annual Report on Form 10-K, Filing No. 1-38730, and incorporated herein by reference).
*10.12	Pension Agreement among Linde AG, Linde Holding GmbH and Mr. Sanjiv Lamba, dated December 20, 2019 (Filed as Exhibit 10.13a to Linde plc's 2019 Annual Report on Form 10-K, Filing No. 1-38730, and incorporated herein by reference).
10.13	Offer Letter between Linde plc and Sanjiv Lamba dated November 12, 2021 (Filed as Exhibit 10.1 to Linde plc's current report on Form 8-K dated November 18, 2021, File No. 1-38730, and incorporated herein by reference).
10.14	Nondisclosure, Nonsolicitation and Noncompetition Agreement between Linde Inc. and Sanjiv Lamba dated as of November 7, 2021 (Filed as Exhibit 10.2 to Linde plc's current report on Form 8-K dated November 18, 2021, File No. 1-38730, and incorporated herein by reference).
*10.15	Form of Linde plc Director Indemnification Agreement (Filed as Exhibit 10.1 to the Company's Current Report on Form 8-K, filed on October 31, 2018, File No. 333-218485, and incorporated herein by reference).
21.01	Subsidiaries of Linde plc
23.01	Consent of Independent Registered Public Accounting Firm.
31.01	Rule 13a-14(a) Certification
31.02	Rule 13a-14(a) Certification
32.01	Section 1350 Certification (such certifications are furnished for the information of the Commission and shall not be deemed incorporated by reference into any filing under the Securities Act or the Exchange Act).
32.02	Section 1350 Certification (such certifications are furnished for the information of the Commission and shall not be deemed incorporated by reference into any filing under the Securities Act or the Exchange Act).
101.INS	XBRL Instance Document: The XBRL Instance Document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document.
101.SCH	XBRL Taxonomy Extension Schema
101.CAL	XBRL Taxonomy Extension Calculation Linkbase

101.LAB	XBRL Taxonomy Extension Label Linkbase
101.PRE	XBRL Taxonomy Extension Presentation Linkbase
101.DEF	XBRL Taxonomy Extension Definition Linkbase

Copies of exhibits incorporated by reference can be obtained from the SEC and are located in SEC File No. 1-11037.

*	Indicates a management contract or compensatory plan or arrangement.
**	Certain schedules or similar attachments have been omitted pursuant to Iten agrees to furnish supplemental copies of any of the omitted schedules or att

ITEM 16. FORM 10-K SUMMARY

None.

SIGNATURES

Linde plc and Subsidiaries

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned thereunto duly authorized.

Linde plc
(Registrant)

Date: February 28, 2022 By: /s/ KELCEY E. HOYT

Kelcey E. Hoyt
Chief Accounting Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the Registrant and in the capacities indicated on February 28, 2022.

/s/ PROF. DR. WOLFGANG REITZLE	/s/ STEPHEN F. ANGEL	/s/ MATTHEW J. WHITE
Wolfgang Reitzle ***Chairman***	**Stephen F. Angel** ***Chief Executive Officer and Director***	**Matthew J. White** ***Chief Financial Officer***
/s/ PROF. DDR. ANN-KRISTIN ACHLIETNER	/s/ DR. CLEMENS BÖRSIG	/s/ DR. NANCE K. DICCIANI
Ann-Kristin Achleitner ***Director***	**Clemens Börsig** ***Director***	**Nance K. Dicciani** ***Director***
/s/ DR. THOMAS ENDERS	/s/ FRANZ FEHRENBACH	/s/ EDWARD G. GALANTE
Thomas Enders ***Director***	**Franz Fehrenbach** ***Director***	**Edward G. Galante** ***Director***
/s/ LARRY D. MCVAY	/s/ DR. VICTORIA OSSADNIK	/s/ PROF. DR. MARTIN H. RICHENHAGEN
Larry D. McVay ***Director***	**Victoria Ossadnik** ***Director***	**Martin Richenhagen** ***Director***
/s/ ROBERT L. WOOD	/s/ ALBERTO WEISSER	/s/ JOSEF KAESER
Robert L. Wood ***Director***	**Alberto Weisser** ***Director***	**Josef Kaeser** ***Director***

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

FORM 10-K

☑ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the fiscal year ended December 31, 2020

OR

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from to
Commission file number 001-38730

LINDE PLC

(Exact name of registrant as specified in its charter)

Ireland

(State or other jurisdiction of incorporation)

The Priestley Centre
10 Priestley Road,
Surrey Research Park,
Guildford, Surrey GU2 7XY
United Kingdom

(Address of principal executive offices) (Zip Code)

+44 14 83 242200

(Registrant's telephone number, including area code)

Securities registered pursuant to Section 12(b) of the Act:

Title of each class:	**Trading Symbol(s)**
Ordinary shares (€0.001 nominal value per share)	**LIN**

Securities registered pursuant to Section 12(g) of the Act: None

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Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☑ No ☐

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes ☐ No ☑

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☑ No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☑ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," " smaller reporting company, " and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer ☑ Accelerated filer ☐ Non- accelerated filer ☐ Smaller reporting company ☐ Emerging growth company ☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. Yes ☑ No ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act). Yes ☐ No ☑

The aggregate market value of the voting and non-voting common stock held by non-affiliates as of June 30, 2020, was approximately $111 billion (based on the closing sale price of the stock on that date as reported on the New York Stock Exchange).

At January 31, 2021, 522,836,425 ordinary shares of €0.001 nominal value per share of the Registrant were outstanding.

Documents incorporated by reference:

Portions of the Proxy Statement of Linde plc for its 2021 Annual General Meeting of Shareholders, are incorporated in Part III of this report.

LINDE PLC

ANNUAL REPORT ON FORM 10-K
For the fiscal year ended December 31, 2020

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FORWARD-LOOKING STATEMENTS

This document contains “forward-looking statements” within the meaning of the Private Securities Litigation Reform Act of 1995. These forward-looking statements are identified by terms and phrases such as: anticipate, believe, intend, estimate, expect, continue, should, could, may, plan, project, predict, will, potential, forecast, and similar expressions. They are based on management’s reasonable expectations and assumptions as of the date the statements are made but involve risks and uncertainties. These risks and uncertainties include, without limitation: the performance of stock markets generally; developments in worldwide and national economies and other international events and circumstances, including trade conflicts and tariffs; changes in foreign currencies and in interest rates; the cost and availability of electric power, natural gas and other raw materials; the ability to achieve price increases to offset cost increases; catastrophic events including natural disasters, epidemics, pandemics such as COVID-19, and acts of war and terrorism; the ability to attract, hire, and retain qualified personnel; the impact of changes in financial accounting standards; the impact of changes in pension plan liabilities; the impact of tax, environmental, healthcare and other legislation and government regulation in jurisdictions in which the company operates; the cost and outcomes of investigations, litigation and regulatory proceedings; the impact of potential unusual or non-recurring items; continued timely development and market acceptance of new products and applications; the impact of competitive products and pricing; future financial and operating performance of major customers and industries served; the impact of information technology system failures, network disruptions and breaches in data security; and the effectiveness and speed of integrating new acquisitions into the business. These risks and uncertainties may cause actual future results or circumstances to differ materially from accounting principles generally accepted in the United States of America, International Financial Reporting Standards or adjusted projections, estimates or other forward-looking statements.

Linde plc assumes no obligation to update or provide revisions to any forward-looking statement in response to changing circumstances. The above listed risks and uncertainties are further described in Item 1A (Risk Factors) in this report, which should be reviewed carefully. Please consider Linde plc’s forward-looking statements in light of those risks.

Linde plc and Subsidiaries

PART I

ITEM 1. BUSINESS

General

Linde plc is a public limited company formed under the laws of Ireland with its principal offices in the United Kingdom. Linde is the largest industrial gas company worldwide and is a major technological innovator in the industrial gases industry. Its primary products in its industrial gases business are atmospheric gases (oxygen, nitrogen, argon, and rare gases) and process gases (carbon dioxide, helium, hydrogen, electronic gases, specialty gases, and acetylene). The company also designs and builds equipment that produces industrial gases and offers customers a wide range of gas production and processing services such as olefin plants, natural gas plants, air separation plants, hydrogen and synthesis gas plants and other types of plants.

Linde serves a diverse group of industries including healthcare, petroleum refining, manufacturing, food, beverage carbonation, fiber-optics, steel making, aerospace, chemicals, electronics and water treatment.

Linde’s sales were $27,243 million, $28,228 million, and $14,836 million for 2020, 2019, and 2018, respectively. Refer to Item 7, Management's Discussion and Analysis, for a discussion of consolidated sales and Note 18 to the consolidated financial statements for additional information related to Linde’s reportable segments.

Industrial Gases Products and Manufacturing Processes

Atmospheric gases are the highest volume products produced by Linde. Using air as its raw material, Linde produces oxygen, nitrogen and argon through several air separation processes of which cryogenic air separation is the most prevalent. Rare gases, such as krypton, neon and xenon, are also produced through cryogenic air separation. As a pioneer in the industrial gases industry, Linde is a leader in developing a wide range of proprietary and patented applications and supply systems technology. Linde also led the development and commercialization of non-cryogenic air separation technologies for the production of industrial gases. These technologies open important new markets and optimize production capacity for the company by lowering the cost of supplying industrial gases. These technologies include proprietary vacuum pressure swing adsorption (“VPSA”) and membrane separation to produce gaseous oxygen and nitrogen, respectively.

Process gases, including carbon dioxide, hydrogen, carbon monoxide, helium, specialty gases and acetylene are produced by methods other than air separation. Most carbon dioxide is purchased from by-product sources, including chemical plants, refineries and industrial processes or is recovered from carbon dioxide wells. Carbon dioxide is processed in Linde’s plants to produce commercial and food-grade carbon dioxide. Hydrogen and carbon monoxide can be produced by either steam methane reforming or auto-thermal reforming of natural gas or other feed streams such as naphtha. Hydrogen is also produced by purifying by-product sources obtained from the chemical and petrochemical industries. Acetylene is primarily sourced as a chemical by-product, but may also be produced from calcium carbide and water.

Industrial Gases Distribution

There are three basic distribution methods for industrial gases: (i) on-site or tonnage; (ii) merchant or bulk liquid; and (iii) packaged or cylinder gases. These distribution methods are often integrated, with products from all three supply modes coming from the same plant. The method of supply is generally determined by the lowest cost means of meeting the customer’s needs, depending upon factors such as volume requirements, purity, pattern of usage, and the form in which the product is used (as a gas or as a cryogenic liquid).

On-site. Customers that require the largest volumes of product (typically oxygen, nitrogen and hydrogen) and that have a relatively constant demand pattern are supplied by cryogenic and process gas on-site plants. Linde constructs plants on or adjacent to these customers’ sites and supplies the product directly to customers by pipeline. On-site product supply contracts generally are total requirement contracts with terms typically ranging from 10-20 years and containing minimum purchase requirements and price escalation provisions. Many of the cryogenic on-site plants also produce liquid products for the merchant market. Therefore, plants are typically not dedicated to a single customer. Advanced air separation processes allow on-site delivery to customers with smaller volume requirements.

Merchant. The merchant business is generally associated with distributable liquid oxygen, nitrogen, argon, carbon dioxide, hydrogen and helium. The deliveries generally are made from Linde’s plants by tanker trucks to storage containers at the customer's site which are owned and maintained by Linde and leased to the customer. Due to distribution cost, merchant oxygen and nitrogen generally have a relatively small distribution radius from the plants at which they are produced. Merchant argon, hydrogen and helium can be shipped much longer distances. The customer agreements used in the merchant business are usually three to seven-year requirement contracts.

Packaged Gases. Customers requiring small volumes are supplied products in metal containers called cylinders, under medium to high pressure. Packaged gases include atmospheric gases, carbon dioxide, hydrogen, helium, acetylene and related products. Linde also produces and distributes in cylinders a wide range of specialty gases and mixtures. Cylinders may be delivered to the customer's site or picked up by the customer at a packaging facility or retail store. Packaged gases are generally sold under one to three-year supply contracts and through purchase orders.

A substantial amount of the cylinder gases sold in the United States are distributed by independent distributors that buy merchant gases in liquid form and repackage the products in their facilities. Packaged gas distributors, including Linde, also distribute hardgoods and welding equipment purchased from independent manufacturers. Over time, Linde has acquired a number of independent industrial gases and welding products distributors at various locations in the United States and continues to sell merchant gases to other independent distributors. Between its own distribution business, joint ventures and sales to independent distributors, Linde is represented in 48 states, the District of Columbia and Puerto Rico.

Engineering

Linde's Engineering business has a global presence, with its focus on market segments such as olefin, natural gas, air separation, hydrogen and synthesis gas plants. The company utilizes its extensive process engineering know-how in the planning, design and construction of highly efficient turnkey plants for the production and processing of gases. With its state-of-the-art sustainable technologies Engineering helps customers avoid, capture and utilize CO2 emissions. Its technology portfolio covers the entire value chain for production, liquefaction, storage, distribution and application of hydrogen which supports the transition to clean energy. Its digital services and solutions increase plant efficiency and performance.

Linde's plants are used in a wide variety of fields: in the petrochemical and chemical industries, in refineries and fertilizer plants, to recover air gases, to produce synthesis gases, to treat natural gas and to produce noble gases.The Engineering business either supplies plant components directly to the customer or to the industrial gas business of Linde which operates the plants under a long-term gases supply contract.

Inventories – Linde carries inventories of merchant and cylinder gases, hardgoods and coatings materials to supply products to its customers on a reasonable delivery schedule. On-site plants and pipeline complexes have limited inventory. Inventory obsolescence is not material to Linde's business.

Customers – Linde is not dependent upon a single customer or a few customers.

International – Linde is a global enterprise with approximately 69% of its 2020 sales outside of the United States. The company also has majority or wholly owned subsidiaries that operate in approximately 45 European, Middle Eastern and African countries (including Germany, France, Sweden, the Republic of South Africa, and the United Kingdom (U.K.)); approximately 20 Asian and South Pacific countries (including China, Australia, India, South Korea and Taiwan); and approximately 20 countries in North and South America (including Canada, Mexico and Brazil).

The company also has equity method investments operating in Europe, Asia, Africa, the Middle East, and North America.

Linde's international business is subject to risks customarily encountered in foreign operations, including fluctuations in foreign currency exchange rates, import and export controls, and other economic, political and regulatory policies of local governments. Also, see Item 1A. "Risk Factors" and Item 7A. "Quantitative and Qualitative Disclosures About Market Risk."

Seasonality – Linde's business is generally not subject to seasonal fluctuations to any significant extent.

Research and Development – Linde's research and development is directed toward development of gas processing, separation and liquefaction technologies, improving distribution of industrial gases and the development of new markets and applications for these gases. This results in the development of new advanced air separation, hydrogen, synthesis gas, natural gas, adsorption and chemical process technologies as well as the frequent introduction of new industrial gas applications. Research and development is primarily conducted at Munich, Germany, Tonawanda, New York, Burr Ridge, Illinois and Shanghai, China.

Patents and Trademarks – Linde owns or licenses a large number of patents that relate to a wide variety of products and processes. Linde's patents expire at various times over the next 20 years. While these patents and licenses are considered important to its individual businesses, Linde does not consider its business as a whole to be materially dependent upon any one particular patent, or patent license, or family of patents. Linde also owns a large number of trademarks, of which the "Linde" trademark is the most significant.

Raw Materials and Energy Costs – Energy is the single largest cost item in the production and distribution of industrial gases. Most of Linde’s energy requirements are in the form of electricity, natural gas and diesel fuel for distribution. The company mitigates electricity, natural gas, and hydrocarbon price fluctuations contractually through pricing formulas, surcharges, and cost pass–through and tolling arrangements.

The supply of energy has not been a significant issue in the geographic areas where the company conducts business. However, energy availability and price is unpredictable and may pose unforeseen future risks.

For carbon dioxide, carbon monoxide, helium, hydrogen, specialty gases and surface technologies, raw materials are largely purchased from outside sources. Linde has contracts or commitments for, or readily available sources of, most of these raw materials; however, their long-term availability and prices are subject to market conditions.

Competition – Linde participates in highly competitive markets in the industrial gases, engineering and healthcare businesses, which are characterized by a mixture of local, regional and global players, all of which exert competitive pressure on the parties. In locations where Linde has pipeline networks, which enable the company to provide reliable and economic supply of products to larger customers, Linde derives a competitive advantage.

Competitors in the industrial and medical gases industry include global and regional companies such as L’Air Liquide S.A., Air Products and Chemicals, Inc., Messer Group GmbH, Mitsubishi Chemical Holdings Corporation (through Taiyo Nippon Sanso Corporation) as well as an extensive number of small to medium size independent industrial gas companies which compete locally as producers or distributors. In addition, a significant portion of the international gases market relates to customer-owned plants.

Employees and Labor Relations – The company sources talent from an ever-changing and competitive environment. The ability to source and retain qualified and committed employees is a prerequisite for the company’s success, and represents a general risk for Linde.

The Board of Directors ("Board") has established a strategic business objective to maintain world-class standards in talent management. Executive variable compensation is assessed annually based on performance in several strategic non-financial areas, including talent management. The Compensation Committee assists the Board in its oversight of Linde’s compensation and incentive policies and programs, and management development and succession, particularly in regard to reviewing executive compensation for Linde’s executive officers. The Compensation Committee also periodically reviews the company’s diversity policies and objectives, and programs to achieve those objectives. The global head of Human Resources reports to the Chief Executive Officer ("CEO"). A global leader of Diversity and Inclusion reports to the head of Human Resources.

Linde has aligned diversity and inclusion with its business strategies and implemented diversity action planning into business process and performance management. Diversity and inclusion are line management responsibilities and Linde seeks competitive advantage through proactive management of its talent pipeline, procurement and recruiting processes. Linde provides equal employment opportunity, and recruits, hires, promotes and compensates people based solely on their merit and ability.

Employees receive a competitive salary and variable compensation components based on merit and depending on their position. Linde has collective bargaining agreements with unions at numerous locations throughout the world. Additional benefits are offered such as occupational pensions and contributions towards health insurance or medical screening, reflecting regional conditions and local competition. Managers’ compensation is based on performance. Senior managers participate directly in the company’s growth in value through the Long Term Incentive Plan of Linde plc. From time to time, Linde may introduce special compensation schemes to recognize or reward specific individuals such as the one implemented in 2020 for global front-line employees. Work-life balance is promoted by providing a range of opportunities that are based on the overall local conditions. Linde also invests in professional development of its employees through formal and on-the-job training.

As of December 31, 2020, Linde had 74,207 employees worldwide comprised of approximately 27 percent women and 73 percent men.

Environment – Information required by this item is incorporated herein by reference to the section captioned “Management’s Discussion and Analysis – Environmental Matters” in Item 7 of this 10-K.

Available Information – The company makes its periodic and current reports available, free of charge, on or through its website, www.linde.com, as soon as practicable after such material is electronically filed with, or furnished to, the

Securities and Exchange Commission ("SEC"). Investors may also access from the company website other investor information such as press releases and presentations. Information on the company's website is not incorporated by reference herein. In addition, the public may read and copy any materials filed with the SEC free of charge at the SEC's website, www.sec.gov, that contains reports, proxy information statements and other information regarding issuers that file electronically.

Executive Officers – The following Executive Officers have been elected by the Board of Directors and serve at the pleasure of the Board. It is expected that the Board will elect officers annually following each annual meeting of shareholders.

Stephen F. Angel, 65, has been Chief Executive Officer and a director of Linde since 2018. Prior to that, Mr. Angel was Chairman, President and CEO of Praxair, Inc. since 2007. Mr. Angel joined Praxair in 2001 as an executive vice president and was named president and chief operating officer in February 2006. Prior to joining Praxair, Angel spent 22 years in a variety of management positions with General Electric. Angel serves on the board of directors of PPG Industries and the Hydrogen Council and is a member of The Business Council.

Kelcey E. Hoyt, age 51, became the Chief Accounting Officer of Linde in October 2018. Prior to this, she served as Vice President and Controller of Praxair, Inc. beginning in August 2016. Prior to becoming Controller, she served as Praxair's Director of Investor Relations since 2010. She joined Praxair in 2002 and served as Director of Corporate Accounting and SEC Reporting through 2008, and later served as Controller for various divisions within Praxair's North American Industrial Gas business. Previously, she was in audit at KPMG, LLP.

Sanjiv Lamba age 56, was appointed Chief Operating Officer of Linde effective January 1, 2021. Previously, he served as the Executive Vice President, APAC of Linde, beginning in October 2018. Prior to that, Mr. Lamba was appointed a Member of the Executive Board of Linde AG in 2011, responsible for the Asia, Pacific segment of the Gases Division, for Global Gases Businesses Helium & Rare Gases, Electronics as well as Asia Joint Venture Management. Mr. Lamba started his career 1989 with BOC India in Finance where he progressed to become Director of Finance before being appointed as Managing Director for BOC's India's business in 2001. Throughout his years with BOC/Linde, he has worked in various roles across a number of different geographies including Germany, the UK, Singapore and India.

Eduardo F. Menezes, age 57, has been Executive Vice President, EMEA of Linde since 2018 and will retire March 31, 2021 after 35 years of service. Mr. Menezes previously served as Executive Vice President of Praxair, Inc. since 2012, responsible for Praxair Europe, Praxair Mexico, Praxair South America and Praxair Asia. From 2010 to March 2011, he was a Vice President of Praxair with responsibility for the North American Industrial Gases business and was named senior vice president in 2011. From 2007 to 2010, he was President of Praxair Europe. He served as Managing Director of Praxair's business in Mexico from 2004 to 2007, as Vice President and General Manager for Praxair Distribution, Inc. from 2003 to 2004 and as Vice President, U.S. West Region, for North American Industrial Gases, from 2000 to 2003.

Juergen Nowicki, 57, was appointed Executive Vice President and CEO, Linde Engineering in April 2020. Prior to this, he was Senior Vice President, Commercial, Linde Engineering. Mr. Nowicki joined Linde in 1991 as an Internal Auditor and held various positions in Finance and Controlling. In 2002, he was appointed CFO Linde Gas North America, USA, and was named Head of Finance and Control for The Linde Group in 2006. Nowicki assumed the role of Managing Director, Linde Engineering in 2011. He holds a master's degree in Industrial Engineering from the Technical University of Karlsruhe, Germany.

Dr. Andreas Opfermann, 49, became Executive Vice President of Americas in November 2019. Prior to this, from 2016-2019, he was the regional business unit leader for Linde's North European region. Dr. Opfermann joined Linde in 2005 initially in Corporate Strategy. He has subsequently served as Head of Innovation Management from 2008 to 2010, Head of Clean Energy and Innovation Management from 2010 to 2014, and Head of Technology and Innovation from 2015 to 2016, responsible for all Linde research and development. Before joining Linde, he held positions at McKinsey & Company.

John Panikar, 53, was appointed Executive Vice President, APAC of Linde effective January 1, 2021. Previously, he served as President UK & Africa of Linde since October, 2018. From 2014 to 2018, Mr. Panikar was President of Praxair Asia. He began his career with Praxair in 1991 as an Applications Engineer. Over the years, Mr. Panikar held increasingly responsible positions including Manager of Site Services and Equipment, Business Development Director for Praxair Asia, Managing Director of Praxair India, VP, South Region, North American Industrial Gases and President, Praxair Distribution, Inc.

Matthew J. White, age 48, became Executive Vice President and Chief Financial Officer of Linde in October 2018. He previously served as the Senior Vice President and Chief Financial Officer of Praxair, Inc. since January 1, 2014.

Prior to this, Mr. White was President of Praxair Canada from 2011-2014. He joined Praxair in 2004 as finance director for the company's largest business unit, North American Industrial Gases. In 2008, he became Vice President and Controller of Praxair, Inc., then was named Vice President and Treasurer in 2010. Before joining Praxair, White was vice president, finance, at Fisher Scientific and before that he held various financial positions, including group controller, at GenTek, a manufacturing and performance chemicals company.

ITEM 1A. RISK FACTORS

Due to the size and geographic reach of the company's operations, a wide range of factors, many of which are outside of the company's control, could materially affect the company's future operations and financial performance. Management believes the following risks may significantly impact the company:

The recent novel coronavirus (COVID-19) outbreak could materially adversely affect our results of operations.

The novel strain of the coronavirus identified in China in late 2019 has globally spread and has resulted in authorities implementing numerous measures to try to contain the virus, such as travel bans and restrictions, quarantines, shelter in place orders, and shutdowns. These measures have impacted and may further impact our workforce and operations, the operations of our customers, vendors and suppliers. There is considerable uncertainty regarding such measures and potential future measures, and restrictions on our access to our manufacturing facilities or on our support operations or workforce, or similar limitations for our vendors and suppliers, and restrictions or disruptions of transportation, such as reduced availability of air transport, port closures, and increased border controls or closures, could limit our capacity to meet customer demand and have a material adverse effect on our results of operations. These restrictions and disruptions could affect our performance on our contracts.

Furthermore, COVID-19 has impacted and may further impact the broader economies of affected countries, including negatively impacting economic growth, the proper functioning of financial and capital markets, foreign currency exchange rates, and interest rates. Risks related to economic conditions are described in our Principal Risks and Uncertainties titled "Weakening economic conditions in markets in which Linde does business may adversely impact its financial results and/or cash flows" and "Macroeconomic factors may impact Linde's ability to obtain financing or increase the cost of obtaining financing which may adversely impact Linde's financial results and/or cash flows."

Weakening economic conditions in markets in which Linde does business may adversely impact its financial results and/or cash flows.

Linde serves a diverse group of industries across more than 100 countries, which generally leads to financial stability through various business cycles. However, a broad decline in general economic or business conditions in the industries served by its customers could adversely affect the demand for Linde's products and impair the ability of its customers to satisfy their obligations to Linde, resulting in uncollected receivables and/or unanticipated contract terminations or project delays. For example, global political and economic uncertainty could reduce investment activities of Linde's customers, which could adversely affect Linde's business.

In addition, many of Linde's customers are in businesses that are cyclical in nature, such as the chemicals, metals and energy industries. Downturns in these industries may adversely impact Linde during these cycles. Additionally, such conditions could impact the utilization of Linde's manufacturing capacity which may require it to recognize impairment losses on tangible assets such as property, plant and equipment, as well as intangible assets such as goodwill, customer relationships or intellectual property.

Increases in the cost of energy and raw materials and/or disruption in the supply of these materials could result in lost sales or reduced profitability.

Energy is the single largest cost item in the production and distribution of industrial gases. Most of Linde's energy requirements are in the form of electricity, natural gas and diesel fuel for distribution. Linde attempts to minimize the financial impact of variability in these costs through the management of customer contracts and reducing demand through operational productivity and energy efficiency. Large customer contracts typically have escalation and pass-through clauses to recover energy and feedstock costs. Such attempts may not successfully mitigate cost variability, which could negatively impact Linde's financial condition or results of operations. The supply of energy has not been a significant issue in the geographic areas where Linde conducts business. However, regional energy conditions are unpredictable and may pose future risk.

For carbon dioxide, carbon monoxide, helium, hydrogen, specialty gases and surface technologies, raw materials are largely purchased from outside sources. Where feasible, Linde sources several of these raw materials, including carbon dioxide, hydrogen and calcium carbide, as chemical or industrial byproducts. In addition, Linde has contracts or commitments for, or readily available sources of, most of these raw materials; however, their long-term availability and prices are subject to market conditions. A disruption in supply of such raw materials could impact Linde’s ability to meet contractual supply commitments.

Linde’s international operations are subject to the risks of doing business abroad and international events and circumstances may adversely impact its business, financial condition or results of operations.

Linde has substantial international operations which are subject to risks including devaluations in currency exchange rates, transportation delays and interruptions, political and economic instability and disruptions, restrictions on the transfer of funds, trade conflicts and the imposition of duties and tariffs, import and export controls, changes in governmental policies, labor unrest, possible nationalization and/or expropriation of assets, changes in U.S. and non-U.S. tax policies and compliance with governmental regulations. These events could have an adverse effect on the international operations of Linde in the future by reducing the demand for its products, decreasing the prices at which it can sell its products, reducing the revenue from international operations or otherwise having an adverse effect on its business.

Currency exchange rate fluctuations and other related risks may adversely affect Linde's results.

Because a significant portion of Linde's revenue is denominated in currencies other than its reporting currency, the U.S. dollar, changes in exchange rates will produce fluctuations in revenue, costs and earnings and may also affect the book value of assets and liabilities and related equity. Although the company from time to time utilizes foreign exchange forward contracts to hedge these exposures, its efforts to minimize currency exposure through such hedging transactions may not be successful depending on market and business conditions. As a result, fluctuations in foreign currency exchange rates could adversely affect Linde’s financial condition, results of operations or cash flows.

Macroeconomic factors may impact Linde’s ability to obtain financing or increase the cost of obtaining financing which may adversely impact Linde’s financial results and/or cash flows.

Volatility and disruption in the U.S., European and global credit and equity markets, from time to time, could make it more difficult for Linde to obtain financing for its operations and/or could increase the cost of obtaining financing. In addition, Linde’s borrowing costs can be affected by short- and long-term debt ratings assigned by independent rating agencies which are based, in significant part, on its performance as measured by certain criteria such as interest coverage and leverage ratios. A decrease in these debt ratings could increase the cost of borrowing or make it more difficult to obtain financing.

An impairment of goodwill or intangible assets could negatively impact the company's financial results.

As of December 31, 2020, the net carrying value of goodwill and other indefinite-lived intangible assets was $28 billion and $2 billion, respectively, primarily as a result of the business combination and the related acquisition method of accounting applied to Linde AG. In accordance with generally accepted accounting principles, the company periodically assesses these assets to determine if they are impaired. Significant negative industry or economic trends, disruptions to business, unexpected significant changes or planned changes in use of the assets, divestitures and sustained market capitalization declines may result in recognition of impairments to goodwill or other indefinite-lived assets. Any charges relating to such impairments could have a material adverse impact on Linde's results of operations in the periods recognized.

Catastrophic events could disrupt the operations of Linde and/or its customers and suppliers and may have a significant adverse impact on the results of operations.

The occurrence of catastrophic events or natural disasters such as extreme weather, including hurricanes and floods; health epidemics; and acts of war or terrorism, could disrupt or delay Linde’s ability to produce and distribute its products to customers and could potentially expose Linde to third-party liability claims. In addition, such events could impact Linde’s customers and suppliers resulting in temporary or long-term outages and/or the limitation of supply of energy and other raw materials used in normal business operations. Linde evaluates the direct and indirect business risks, consults with vendors, insurance providers and industry experts, makes investments in suitably resilient design and technology, and conducts regular reviews of the business risks with management. Despite these steps, however, these situations are outside Linde’s control and may have a significant adverse impact on its financial results.

The inability to attract and retain qualified personnel may adversely impact Linde's business.

If Linde fails to attract, hire and retain qualified personnel, it may not be able to develop, market or sell its products or successfully manage its business. Linde is dependent upon a highly skilled, experienced and efficient workforce to be successful. Much of Linde's competitive advantage is based on the expertise and experience of key personnel regarding marketing, technology, manufacturing and distribution infrastructure, systems and products. The inability to attract and hire qualified individuals or the loss of key employees in very skilled areas could have a negative effect on Linde's financial results.

If Linde fails to keep pace with technological advances in the industry or if new technology initiatives do not become commercially accepted, customers may not continue to buy Linde's products and results of operations could be adversely affected.

Linde's research and development is directed toward developing new and improved methods for the production and distribution of industrial gases, the design and construction of plants and toward developing new markets and applications for the use of industrial and process gases. This results in the introduction of new applications and the development of new advanced process technologies. As a result of these efforts, Linde develops new and proprietary technologies and employs necessary measures to protect such technologies within the global geographies in which Linde operates. These technologies help Linde to create a competitive advantage and to provide a platform to grow its business. If Linde's research and development activities do not keep pace with competitors or if Linde does not create new technologies that benefit customers, future results of operations could be adversely affected.

Risks related to pension benefit plans may adversely impact Linde's results of operations and cash flows.

Pension benefits represent significant financial obligations that will be ultimately settled in the future with employees who meet eligibility requirements. Because of the uncertainties involved in estimating the timing and amount of future payments and asset returns, significant estimates are required to calculate pension expense and liabilities related to Linde's plans. Linde utilizes the services of independent actuaries, whose models are used to facilitate these calculations. Several key assumptions are used in the actuarial models to calculate pension expense and liability amounts recorded in the consolidated financial statements. In particular, significant changes in actual investment returns on pension assets, discount rates, or legislative or regulatory changes could impact future results of operations and required pension contributions.

Operational risks may adversely impact Linde's business or results of operations.

Linde's operating results are dependent on the continued operation of its production facilities and its ability to meet customer contract requirements and other needs. Insufficient or excess capacity threatens Linde's ability to generate competitive profit margins and may expose Linde to liabilities related to contract commitments. Operating results are also dependent on Linde's ability to complete new construction projects on time, on budget and in accordance with performance requirements. Failure to do so may expose Linde's business to loss of revenue, potential litigation and loss of business reputation.

Also inherent in the management of Linde's production facilities and delivery systems, including storage, vehicle transportation and pipelines, are operational risks that require continuous training, oversight and control. Material operating failures at production, storage facilities or pipelines, including fire, toxic release and explosions, or the occurrence of vehicle transportation accidents could result in loss of life, damage to the environment, loss of production and/or extensive property damage, all of which may negatively impact Linde's financial results.

Linde may be subject to information technology system failures, network disruptions and breaches in data security.

Linde relies on information technology systems and networks for business and operational activities, and also stores and processes sensitive business and proprietary information in these systems and networks. These systems are susceptible to outages due to fire, flood, power loss, telecommunications failures, viruses, break-ins and similar events, or breaches of security.

Linde has taken steps to address these risks and concerns by implementing advanced security technologies, internal controls, network and data center resiliency and recovery process. Despite these steps, however, operational failures and breaches of security from increasingly sophisticated cyber threats could lead to the loss or disclosure of confidential information, result in business interruption or malfunction or regulatory actions and have a material adverse impact on Linde’s operations, reputation and financial results.

The inability to effectively integrate acquisitions or collaborate with joint venture partners could adversely impact Linde’s financial position and results of operations.

Linde has evaluated and expects to continue to evaluate, a wide array of potential strategic acquisitions and joint ventures. Many of these transactions, if consummated, could be material to its financial condition and results of operations. In addition, the process of integrating an acquired company, business or group of assets may create unforeseen operating difficulties and expenditures. Although historically Linde has been successful with its acquisition strategy and execution, the areas where Linde may face risks include:

- the need to implement or remediate controls, procedures and policies appropriate for a larger public company at companies that prior to the acquisition lacked these controls, procedures and policies;
- diversion of management time and focus from operating existing business to acquisition integration challenges;
- cultural challenges associated with integrating employees from the acquired company into the existing organization;
- the need to integrate each company’s accounting, management information, human resources and other administrative systems to permit effective management;
- difficulty with the assimilation of acquired operations and products;
- failure to achieve targeted synergies and cost reductions; and
- inability to retain key employees and business relationships of acquired companies.

Foreign acquisitions and joint ventures involve unique risks in addition to those mentioned herein, including those related to integration of operations across different cultures and languages, currency risks and the particular economic, political and regulatory risks associated with specific countries.

Also, the anticipated benefit of potential future acquisitions may not materialize. Future acquisitions or dispositions could result in the incurrence of debt, contingent liabilities or amortization expenses, or impairments of goodwill, any of which could adversely impact Linde’s financial results.

Linde is subject to a variety of international laws and government regulations and changes in, or failure to comply with, these laws or regulations could have an adverse impact on the company’s business, financial position and results of operations.

Linde is subject to regulations in the following areas, among others:

- environmental protection, including climate change and energy efficiency laws and policies;
- U.S. and non-U.S. tax laws and currency controls;
- safety;
- securities laws applicable in the United States, the European Union, Germany, Ireland, and other jurisdictions;
- trade and import/export restrictions, as well as economic sanctions laws;
- antitrust matters;
- data protection;
- global anti-bribery laws, including the U.S. Foreign Corrupt Practices Act; and
- healthcare regulations.

Changes in these or other regulatory areas may impact Linde’s profitability and may give rise to new or increased compliance risks: it may become more complex and costly to ensure compliance, and the level of sanctions in the event of non-compliance may rise. Noncompliance with such laws and regulations could result in penalties or sanctions, cancellation of marketing rights or restrictions on participation in, or even exclusion from, public tender proceedings, all of which could have a material adverse impact on Linde’s financial results and/or reputation.

Such changes may also restrict Linde’s ability to compete effectively in the marketplace. Changes to regulations in the areas of environmental protection and climate change, for example, may impact customer and competitor behavior driving structural changes in key end markets. While Linde will work to mitigate these risks through the pursuit of strategic alliances and investment in applications technologies to capture new growth areas, given the uncertainty about the type and scope of new regulations, it is difficult to predict how such changes and their impact on market behavior will ultimately impact Linde’s business. However, such changes could have a material adverse impact on Linde's results of operations.

Doing business globally requires Linde to comply with anti-corruption, trade, compliance and economic sanctions and similar laws, and to implement policies and procedures designed to ensure that its employees and other intermediaries comply with the applicable restrictions. These restrictions include prohibitions on the sale or supply of certain products, services and any other economic resources to embargoed or sanctioned countries, governments, persons and entities. Compliance with these restrictions requires, among other things, screening of business partners. Despite its commitment to legal compliance and corporate ethics, the company cannot ensure that its policies and procedures will always protect it from intentional, reckless or negligent acts committed by employees or agents under the applicable laws. If Linde fails to comply with laws governing the conduct of international operations, Linde may be subject to criminal and civil penalties and other remedial measures, which could materially adversely affect its reputation, business and results of operations.

The outcome of litigation or governmental investigations may adversely impact the company’s business or results of operations.

Linde’s subsidiaries are party to various lawsuits and governmental investigations arising in the ordinary course of business. Adverse outcomes in some or all of the claims pending may result in significant monetary damages or injunctive relief that could adversely affect Linde’s ability to conduct business. Linde and its subsidiaries may in the future become subject to further claims and litigation, which is impossible to predict. The litigation and other claims Linde faces are subject to inherent uncertainties. Legal or regulatory judgments or agreed settlements might give rise to expenses which are not covered, or are not fully covered, by insurance benefits and may also lead to negative publicity and reputational damage. An unfavorable outcome or determination could cause a material adverse impact on the company’s results of operations.

Potential product defects or inadequate customer care may adversely impact Linde’s business or results of operations.

Risks associated with products and services may result in potential liability claims, the loss of customers or damage to Linde’s reputation. Principal possible causes of risks associated with products and services are product defects or an inadequate level of customer care when Linde is providing services.

Linde is exposed to legal risks relating to product liability in the countries where it operates, including countries such as the United States, where legal risks (in particular through class actions) have historically been more significant than in other countries. The outcome of any pending or future products and services proceedings or investigations cannot be predicted and legal or regulatory judgments or agreed settlements may give rise to significant losses, costs and expenses.

The manufacturing and sale of products as well as the construction of plants by Linde may give rise to risks associated with the production, filling, storage, handling and transport of raw materials, goods or waste. Industrial gases are potentially hazardous substances and medical gases and the related healthcare services must comply with the relevant specifications in order to not adversely affect the health of patients treated with them.

Linde’s products and services, if defective or not handled or performed appropriately, may lead to personal injuries, business interruptions, environmental damages or other significant damages, which may result, among other consequences, in liability, losses, monetary penalties or compensation payments, environmental clean-up costs or other costs and expenses, exclusion from certain market sectors deemed important for future development of the business and loss of reputation. All these consequences could have a material adverse effect on Linde’s business and results of operations.

U.S. civil liabilities may not be enforceable against Linde.

Linde is organized under the laws of Ireland and substantial portions of its assets will be located outside of the United States. In addition, certain directors and officers of Linde and its subsidiaries reside outside the United States. As a result, it may be difficult for investors to effect service of process within the United States upon Linde or such persons, or to enforce outside the United States judgments obtained against such persons in U.S. courts in any action, including actions predicated upon the civil liability provisions of the U.S. federal securities laws. In addition, it may be difficult for investors to enforce, in original actions brought in courts in jurisdictions located outside the United States, rights predicated upon the U.S. federal securities laws.

A judgment for the payment of money rendered by a court in the United States based on civil liability would not be automatically enforceable in Ireland. There is no treaty between Ireland and the United States providing for the reciprocal enforcement of foreign judgments. The following requirements must be met before the foreign judgment will be deemed to be enforceable in Ireland (i) the judgment must be for a definite sum, (ii) the judgment must be final and conclusive; and (iii) the judgment must be provided by a court of competent jurisdiction.

An Irish court will also exercise its right to refuse judgment if the foreign judgment (i) was obtained by fraud; (ii) violated Irish public policy; (iii) is in breach of natural justice; or (iv) if the judgment is irreconcilable with an earlier foreign judgment.

In addition, there is doubt as to whether an Irish court would accept jurisdiction and impose civil liability on Linde or such persons in an original action predicated solely upon the U.S. federal securities laws brought in a court of competent jurisdiction in Ireland against Linde or such member, officer or expert, respectively.

Changes in tax laws or policy could adversely impact the company's financial position or results of operations.

Linde and its subsidiaries are subject to the tax rules and regulations in the U.S., Germany, Ireland, the U.K. and other countries in which they operate. Those tax rules and regulations are subject to change on a prospective or retroactive basis. Under current economic and political conditions tax rates and policies in any jurisdiction, including the U.S., the U.K. and the EU, are subject to significant changes which could result in a significant change to Linde's current and deferred income tax. In particular, since Linde is currently treated as U.K. tax resident, any potential changes in the tax rules applying to U.K. tax-resident companies would directly affect Linde.

A change in Linde's tax residency could have a negative effect on the company's future profitability and may trigger taxes on dividends or exit charges. If Linde ceases to be resident in the U.K. and becomes resident in another jurisdiction, it may be subject to U.K. exit charges, and/or could become liable for additional tax charges in the other jurisdiction. If Linde were to be treated as resident in more than one jurisdiction, it could be subject to duplicative taxation. Furthermore, although Linde is incorporated in Ireland and is not expected to be treated as a domestic corporation for U.S. federal income tax purposes, it is possible that the IRS could challenge this result or that changes in U.S. federal income tax law could alter this result. If the IRS successfully asserted such a position or the law were to change, significant adverse tax consequences may result for Linde, the company and Linde's shareholders.

Changes in tax laws may result in higher tax expense and tax payments. In addition, changes in tax legislation and uncertainty about the tax environment in some regions may restrict Linde's opportunity to enforce its respective rights under the law. Linde also operates in countries with complex tax regulations which could be interpreted in different ways. Linde and its subsidiaries are subject to audits by taxing authorities in various jurisdictions or other review actions by the relevant financial or tax authorities. The ultimate tax outcome may differ from the amounts recorded in Linde's or its subsidiaries' financial statements and may materially affect their respective financial results for the period when such determination is made.

ITEM 1B. UNRESOLVED STAFF COMMENTS

Linde has received no written SEC staff comments regarding any of its Exchange Act reports which remain unresolved.

ITEM 2. PROPERTIES

Linde plc's principal executive offices are located in owned office space in Guildford, United Kingdom. Linde also owns principal administrative office space in Danbury, Connecticut and Houston, Texas, United States; and Pullach, Germany.

Due to the nature of Linde's industrial gas products, it is generally uneconomical to transport them distances greater than a few hundred miles from the production facility. As a result, Linde operates a significant number of production facilities spread globally throughout a number of geographic regions.

The following is a description of production facilities for Linde by segment. No significant portion of these assets was leased at December 31, 2020. Generally, these facilities are utilized and are sufficient to meet the company's manufacturing needs.

Americas

The Americas segment operates production facilities primarily in the U.S., Canada, Mexico and Brazil, approximately 350 of which are mainly cryogenic air separation plants, hydrogen plants and carbon dioxide plants. There are five major pipeline complexes in North America located in northern Indiana, Houston, along the Gulf Coast of Texas, Detroit and Louisiana. Also located throughout the Americas are noncryogenic air separation plants, packaged gas facilities and other smaller plant facilities.

EMEA

The EMEA segment has production facilities primarily in Germany, France, Sweden, the Republic of South Africa, and the U.K. which include approximately 275 cryogenic air separation plants and carbon dioxide plants. Also located throughout Europe are noncryogenic air separation plants, packaged gas facilities and other smaller plant facilities.

APAC

The APAC segment has production facilities located primarily in China, Australia, India, South Korea and Thailand, approximately 230 of which are cryogenic air separation plants and carbon dioxide plants. Also located throughout Asia are noncryogenic air separation plants, hydrogen, packaged gas and other production facilities.

Engineering

The Linde Engineering business designs and constructs turnkey process plants for third-party customers as well as for the gases businesses in many locations worldwide, such as olefin plants, natural gas plants, air separation plants, hydrogen and synthesis gas plants. Plant components are produced in owned factories in Pullach and Tacherting, Germany; Hesinque, France; Oklahoma, United States; and Dalian, China.

ITEM 3. LEGAL PROCEEDINGS

Information required by this item is incorporated herein by reference to the section captioned "Notes to Consolidated Financial Statements – 17. Commitments and Contingencies" in Item 8 of this 10-K.

ITEM 4. MINE SAFETY DISCLOSURES

Not Applicable.

PART II

ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

Linde plc shares trade on the New York Stock Exchange ("NYSE") and the Frankfurt Stock Exchange ("FSE") under the ticker symbol "LIN". At December 31, 2020 there were 8,947 shareholders of record.

Purchases of Equity Securities – Certain information regarding purchases made by or on behalf of the company or any affiliated purchaser (as defined in Rule 10b-18(a)(3) under the Securities Exchange Act of 1934, as amended) of its ordinary shares during the three months ended December 31, 2020 is provided below:

Period	Total Number of Shares Purchased *(Thousands)*	Average Price Paid Per Share	Total Number of Shares Purchased as Part of Publicly Announced Program (1) *(Thousands)*	Approximate Dollar Value of Shares that May Yet be Purchased Under the Program (2) *(Millions)*
October 2020	666	$ 230.39	666	$ 1,549
November 2020	338	$ 249.49	338	$ 1,464
December 2020	746	$ 252.20	746	$ 1,276
Fourth Quarter 2020	1,750	$ 243.38	1,750	$ 1,276

(1) On January 22, 2019 the company's board of directors approved the repurchase of $6.0 billion of its ordinary shares ("2019 program") which could take place from time to time on the open market (and could include the use of 10b5-1 trading plans), subject to market and business conditions. The 2019 program had a maximum repurchase amount of 15% of outstanding shares and expired on February 1, 2021 and any amounts that remained available under the 2019 program also expired.

(2) As of December 31, 2020, the company repurchased $4.7 billion of its ordinary shares pursuant to the 2019 program, leaving an additional $1.3 billion authorized under the 2019 program.

On January 25, 2021 the company's board of directors approved the repurchase of $5.0 billion of its ordinary shares ("2021 program") which could take place from time to time on the open market (and could include the use of 10b5-1 trading plans), subject to market and business conditions. The 2021 program has a maximum repurchase amount of 15% of outstanding shares, began on February 1, 2021 and expires on July 31, 2023.

Peer Performance Table – The graph below compares the most recent five-year cumulative returns of the common stock of Praxair, the company's predecessor, through October 31, 2018 and Linde's ordinary shares for periods subsequent to October 31, 2018 with those of the Standard & Poor’s 500 Index ("SPX") and the S5 Materials Index ("S5MATR") which covers 22 companies, including Linde. The figures assume an initial investment of $100 on December 31, 2015 and that all dividends have been reinvested. lin-20201231_g1.jpg

	2015	**2016**	**2017**	**2018**	**2019**	**2020**
LIN	$100	$117	$159	$164	$228	$286
SPX	$100	$112	$136	$131	$172	$203
S5MATR	$100	$117	$145	$123	$154	$186

ITEM 6. SELECTED FINANCIAL DATA

Not applicable.

ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

The following discussion of the company's financial condition and results of operations should be read together with its consolidated financial statements and notes to the consolidated financial statements included in Item 8 of this Form 10-K.

BUSINESS OVERVIEW

The company's primary products in its industrial gases business are atmospheric gases (oxygen, nitrogen, argon, rare gases) and process gases (carbon dioxide, helium, hydrogen, electronic gases, specialty gases, acetylene). The company also designs, engineers, and builds equipment that produces industrial gases and offers its customers a wide range of gas production and processing services such as olefin plants, natural gas plants, air separation plants, hydrogen and synthesis gas plants and other types of plants.

Linde’s industrial gas operations are managed on a geographical basis and in 2020 83% of sales were generated by Linde's three geographic segments (Americas, EMEA and APAC) and the remaining 17% are related primarily to the Engineering segment, and to a lesser extent Other (see Note 18 to the consolidated financial statements for operating segment details).

Linde serves a diverse group of industries including healthcare, petroleum refining, manufacturing, food, beverage carbonation, fiber-optics, steel making, aerospace, chemicals and water treatment. The diversity of end-markets supports financial stability for Linde in varied business cycles.

Linde generates most of its revenues and earnings in the following geographies where the company has its strongest market positions and where distribution and production operations allow the company to deliver the highest level of service to its customers at the lowest cost.

North and South America ("Americas")	**Europe, Middle East and Africa (“EMEA”)**	**Asia and Pacific (“APAC”)**
United States	Germany	China & Taiwan
Brazil	United Kingdom	Australia
Mexico	Eastern Europe	South Korea
Canada		India

The company manufactures and distributes its industrial gas products through networks of thousands of production plants, pipeline complexes, distribution centers and delivery vehicles. Major pipeline complexes are primarily located in the United States. These networks are a competitive advantage, providing the foundation of reliable product supply to the company’s customer base. The majority of Linde’s business is conducted through long-term contracts which provide stability in cash flow and the ability to pass through changes in energy and feedstock costs to customers. The company has growth opportunities in all major geographies and in diverse end-markets such as energy, electronics, chemicals, metals, healthcare, food and beverage, and aerospace.

EXECUTIVE SUMMARY – FINANCIAL RESULTS & OUTLOOK

2020 Year in review

- Sales of $27,243 million were 3% below 2019 sales of $28,228 million. Volumes decreased 2% as growth from project start-ups was more than offset by the global macroeconomic slowdown as a result of the COVID-19 pandemic. Higher pricing across all geographic segments contributed 2% to sales. Unfavorable currency translation, lower cost pass-through and the net impact of acquisitions and divestitures decreased sales by 3%.
- Reported operating profit of $3,322 million was 13% above 2019. Adjusted operating profit of $5,797 million was 10% above 2019. The increase in both reported and adjusted operating profit was primarily driven by higher price and the benefit of cost reduction programs and other charges and productivity initiatives which more than offset the impact of lower volumes.*
- Income from continuing operations of $2,497 million and diluted earnings per share from continuing operations of $4.70 increased from $2,183 million and $4.00, respectively in 2019. Adjusted income from continuing operations of $4,371 million and adjusted diluted earnings per share from continuing operations of $8.23 were 9% and 12%, respectively above 2019 adjusted amounts.*
- Cash flow from operations was $7,429 million, or 27% of sales. Capital expenditures were $3,400 million; dividends paid were $2,028 million; net purchases of ordinary shares of $2,410 million; and debt borrowings, net were $1,313 million.

*A reconciliation of the adjusted amounts can be found in the "Non-GAAP Financial Measures" section in this MD&A.

2021 Outlook

Linde provides quarterly updates on operating results, material trends that may affect financial performance, and financial guidance via earnings releases and investor teleconferences. These materials are available on the company's website, www.linde.com, but are not incorporated herein.

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CONSOLIDATED RESULTS AND OTHER INFORMATION

The discussion that follows includes a comparison of our results of operations and liquidity and capital resources for the years ended December 31, 2020 and 2019. For the discussion comparing the years ended December 31, 2019 and 2018, refer to Part II, Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations, of our Form 10-K for the year ended December 31, 2019.

The following table provides summary information for 2020 and 2019. The reported amounts are GAAP amounts from the Consolidated Statements of Income. The adjusted amounts are intended to supplement investors' understanding of the company's financial information and are not a substitute for GAAP measures.

(Millions of dollars, except per share data) **Year Ended December 31,**		**2020**		**2019**	**Variance**
Reported Amounts					
Sales	$	27,243	$	28,228	(3)%
Cost of sales, exclusive of depreciation and amortization	$	15,383	$	16,644	(8)%
As a percent of sales		56.5 %		59.0 %	
Selling, general and administrative	$	3,193	$	3,457	(8)%
As a percent of sales		11.7 %		12.2 %	
Depreciation and amortization	$	4,626	$	4,675	(1)%
Cost reduction programs and other charges (a)	$	506	$	567	(11)%
Net gain on sale of businesses (b)	$	—	$	164	
Operating Profit	$	3,322	$	2,933	13 %
Operating margin		12.2 %		10.4 %	
Interest expense – net	$	115	$	38	203 %
Net pension and OPEB cost (benefit), excluding service cost	$	(177)	$	(32)	453 %
Effective tax rate		25.0 %		26.3 %	
Income from equity investments	$	85	$	114	(25)%
Noncontrolling interests from continuing operations	$	(125)	$	(89)	40 %
Income from continuing operations	$	2,497	$	2,183	14 %
Diluted earnings per share from continuing operations	$	4.70	$	4.00	18 %
Diluted shares outstanding		531,157		545,170	(3)%
Number of employees		74,207		79,886	(7)%
Adjusted Amounts (c)					
Operating profit	$	5,797	$	5,272	10 %
Operating margin		21.3 %		18.7 %	
Income from continuing operations	$	4,371	$	4,003	9 %
Diluted earnings per share from continuing operations	$	8.23	$	7.34	12 %
Other Financial Data (c)					
EBITDA from continuing operations	$	8,033	$	7,722	4 %
As percent of sales		29.5 %		27.4 %	
Adjusted EBITDA from continuing operations	$	8,645	$	8,178	6 %
As percent of sales		31.7 %		29.0 %	

(a) See Note 3 to the consolidated financial statements.

(b) See Note 2 to the consolidated financial statements.

(c) Adjusted amounts and Other Financial Data are non-GAAP performance measures. A reconciliation of reported amounts to adjusted amounts can be found in the "Non-GAAP Financial Measures" section of this MD&A.

Results of Operations

The following table provides a summary of changes in consolidated sales:

	2020 vs. 2019
	% Change
Factors Contributing to Changes - Sales	
Volume	(2)%
Price/Mix	2 %
Cost pass-through	(1)%
Currency	(1)%
Acquisitions/divestitures	(1)%
Engineering	— %
	(3)%

2020 Compared With 2019

Sales
Reported sales decreased $985 million, or 3%, for the 2020 year versus 2019. On an adjusted basis sales decreased $920 million in 2020 compared to 2019.

On a reported and adjusted basis, sales decreased 3%. Volume decreased sales by 2% primarily driven by the impact of the macroeconomic slowdown, partially offset by new project start-ups. Higher pricing across all geographic segments contributed 2% to sales. Currency translation decreased sales by 1%, largely in the Americas, driven by the weakening of the Brazilian real against the U.S. dollar. Cost pass-through decreased sales by 1% with minimal impact on operating profit. The impact of merger-related divestitures decreased sales by $65 million in 2020. These sales have been excluded from the adjusted numbers.

Cost of sales, exclusive of depreciation and amortization
Cost of sales, exclusive of depreciation and amortization, decreased $1,261 million, or 8%, for the year primarily due to lower volumes and the impact of productivity initiatives. Cost of sales, exclusive of depreciation and amortization, was 56.5% and 59.0% of sales, respectively, in 2020 compared to 2019. The decrease as a percentage of sales was due primarily to the impact of cost reduction programs and productivity initiatives and the impact of lower cost pass-through.

Selling, general and administrative expenses
Selling, general and administrative expense ("SG&A") decreased $264 million, or 8%, in 2020 to $3,193 million. SG&A was 11.7% of sales in 2020 versus 12.2% in 2019. Currency impacts decreased SG&A by approximately $34 million in 2020. Excluding currency impacts, underlying SG&A decreased driven by the impact of cost reduction programs and productivity initiatives.

Depreciation and amortization
Reported depreciation and amortization expense decreased $49 million, or 1%, versus 2019. The decrease is primarily due to currency translation impacts.

On an adjusted basis, depreciation and amortization expense decreased $29 million, or 1%, versus 2019. The decrease is primarily due to currency translation impacts which decreased depreciation and amortization by approximately $39 million in 2020 slightly offset by new project start ups primarily in APAC and the Americas.

Cost reduction programs and other charges
Linde recorded cost reduction programs and other charges of $506 million and $567 million for 2020 and 2019, respectively, primarily associated with the company's cost reduction program, which represents charges for achieving synergies and cost efficiencies related to the merger. 2019 also included an asset impairment of approximately $73 million related to a joint venture in APAC resulting from an unfavorable arbitration ruling (see Note 3 to the consolidated financial statements).

On an adjusted basis, these costs have been eliminated in both periods.

Operating profit

Reported operating profit increased $389 million in 2020, or 13%. On an adjusted basis, operating profit increased $525 million, or 10%, for 2020 versus 2019.

On a reported basis, operating profit increased $389 million, or 13% in 2020. The increase in the year was driven by higher price and the benefit of cost reduction programs and productivity initiatives. Cost reduction programs and other charges were $506 million in 2020 and $567 million in 2019. 2019 also included a $164 million one time net gain on sale of business.

On an adjusted basis, which excludes the impacts of purchase accounting, cost reduction programs and other charges and net gains from merger-related divestitures in 2019, operating profit increased $525 million, or 10%. Operating profit growth was driven by higher price and the benefit of cost reduction programs and productivity initiatives which were partially offset by lower volumes, unfavorable currency impacts and cost inflation. A discussion of operating profit by segment is included in the segment discussion that follows.

Interest expense - net

Reported interest expense – net in 2020 increased $77 million, or 203%, versus 2019 and included a $16 million charge for the early redemption of bonds due in 2021 (see Note 11 to the consolidated financial statements). On an adjusted basis interest expense increased $50 million, or 37% in 2020 as compared to 2019.

On both a reported and adjusted basis, the increase year over year included the impact of unfavorable foreign currency revaluation on unhedged intercompany loans and lower interest income, partially offset by a lower effective borrowing rate.

Net pension and OPEB cost (benefit), excluding service cost

Reported net pension and OPEB cost (benefit), excluding service cost was a benefit of $177 million in 2020 versus a benefit of $32 million in 2019. 2020 included pension settlement charges of $6 million while 2019 included pension settlement charges of $97 million and a net $8 million curtailment charge (see Note 16 to the consolidated financial statements). Excluding the impact of these charges, the net pension and OPEB benefit, excluding service cost increased $46 million in 2020, as the benefit of lower interest cost due to the low discount rate environment more than offset higher amortization of deferred losses.

Effective tax rate

The reported effective tax rate ("ETR") for 2020 was 25.0% versus 26.3% in 2019. The decrease in the reported ETR is primarily due to higher tax benefits from share option exercises and higher tax expense in 2019 related to divestitures.

On an adjusted basis, the ETR for 2020 was 23.8% versus 24.0% in 2019. The decrease in the adjusted ETR is primarily due to higher tax benefits from share option exercises.

Income from equity investments

Reported income from equity investments for 2020 was $85 million as compared to $114 million in 2019. On an adjusted basis, income from equity investments for 2020 was $142 million versus $171 million in 2019. The decrease in the reported and adjusted income from equity investments was primarily driven by unfavorable foreign currency revaluation impacts on an unhedged loan of an investment in EMEA.

Noncontrolling interests from continuing operations

At December 31, 2020, noncontrolling interests from continuing operations consisted primarily of noncontrolling shareholders' investments in APAC (primarily in China) and surface technologies.

Reported noncontrolling interests from continuing operations increased $36 million to $125 million in 2020 from $89 million in 2019, primarily driven by the noncontrolling interest impact of $33 million for an asset impairment charge in the third quarter 2019 related to a joint venture in APAC.

Adjusted noncontrolling interests from continuing operations increased $8 million in 2020 as compared to 2019.

Income from continuing operations

Reported income from continuing operations increased $314 million, or 14%, primarily due to higher overall operating profit and a lower effective tax rate.

On an adjusted basis, which excludes the impacts of purchase accounting and other non-GAAP adjustments, income from continuing operations increased $368 million, or 9%, in 2020 versus 2019. The increase was primarily due to higher adjusted operating profit partially offset by higher interest expense and lower equity income.

Diluted earnings per share from continuing operations

Reported diluted earnings per share from continuing operations increased $0.70, or 18%, in 2020 as compared to 2019.

On an adjusted basis, diluted EPS of $8.23 in 2020 increased 12% versus 2019, primarily due to higher income from continuing operations and lower diluted shares outstanding.

Employees

The number of employees at December 31, 2020 was 74,207, a decrease of 5,679 employees from December 31, 2019 primarily driven by cost reduction actions and divestitures.

Other Financial Data

EBITDA increased to $8,033 million in 2020 from $7,722 million in 2019. Adjusted EBITDA from continuing operations increased to $8,645 million for 2020 as compared to $8,178 million in 2019 primarily due to higher income from continuing operations versus the prior year period.

See the "Non-GAAP Financial Measures" section for definitions and reconciliations of these non-GAAP measures to reported GAAP amounts.

Other Comprehensive Income (Loss)

Other comprehensive income for the year ended December 31, 2020 of $157 million resulted primarily from currency translation adjustments of $595 million largely offset by a decrease in the funded status of the company's retirement obligations of $469 million driven by the low discount rate environment. The translation adjustments reflect the impact of translating local currency foreign subsidiary financial statements to U.S. dollars, and are largely driven by the movement of the U.S. dollar against major currencies including the Euro, the Chinese yuan and the British pound. See the "Currency" section of the MD&A for exchange rates used for translation purposes and Note 7 to the consolidated financial statements for a summary of the currency translation adjustment component of accumulated other comprehensive income by segment.

Related Party Transactions

The company's related parties are primarily unconsolidated equity affiliates. The company did not engage in any material transactions involving related parties that included terms or other aspects that differ from those which would be negotiated with independent parties.

Environmental Matters

Linde's principal operations relate to the production and distribution of atmospheric and other industrial gases, which historically have not had a significant impact on the environment. However, worldwide costs relating to environmental protection may continue to grow due to increasingly stringent laws and regulations, and Linde's ongoing commitment to rigorous internal standards. In addition, Linde may face physical risks from climate change and extreme weather.

Climate Change

Linde operates in jurisdictions that have, or are developing, laws and/or regulations to reduce or mitigate the perceived adverse effects of greenhouse gas ("GHG") emissions and faces a highly uncertain regulatory environment in this area. For example, the U.S. Environmental Protection Agency ("EPA") has promulgated rules requiring reporting of GHG emissions, and Linde and many of its suppliers and customers are subject to these rules. EPA has also promulgated regulations to restrict GHG emissions, including final rules regulating GHG emissions from light-duty vehicles and certain large manufacturing facilities, many of which are Linde suppliers or customers. In addition to these developments in the United States, several other countries worldwide have already implemented carbon taxation or trading systems which impact the company's customers and Linde operations, among those regulations in China, Singapore and the European Union. Among other impacts, such regulations are expected to raise the cost of energy, which is a significant cost for Linde. Nevertheless, Linde's long-term customer contracts routinely provide rights to recover increased electricity, natural gas, and other costs that are incurred by the company as a result of climate change regulation.

Linde anticipates continued growth in its hydrogen business due to increased focus on air quality. Hydrogen production plants and a large number of other manufacturing and electricity-generating plants have been identified in California and the European Union as a source of carbon dioxide emissions and these plants are subject to cap-and-trade regulations in those jurisdictions. Linde believes it will be able to mitigate the costs of these regulations through the terms of its product supply contracts. However, legislation that limits GHG emissions may impact growth by increasing capital, compliance, operating and maintenance costs and/or decreasing demand.

To manage business risks from current and potential GHG emission regulation as well as physical consequences of climate change, Linde actively monitors current developments, evaluates the direct and indirect business risks, and takes appropriate actions. Among others, actions include: increasing relevant resources and training; maintaining contingency plans; obtaining advice and counsel from expert vendors, insurance providers and industry experts; incorporating GHG provisions in commercial agreements; and conducting regular reviews of the business risks with management. Although there are considerable uncertainties, Linde believes that the business risk from potential regulations can be effectively managed through its commercial contracts. Additionally, Linde does not anticipate any material effects regarding its plant operations or business arising from potential physical risks of climate change.

Linde continuously seeks opportunities to optimize energy use and GHG footprint through research and development in customer applications and rigorous operational energy efficiency, investment in renewable energy, and purchasing hydrogen as a chemical byproduct where feasible. Linde maintains related performance improvement targets and reports progress against these targets regularly to business management and annually to Linde's Board of Directors.

At the same time, Linde may benefit from business opportunities arising from governmental regulation of GHG and other emissions; uncertain costs of energy and certain natural resources; the development of renewable energy alternatives; and new technologies that help extract natural gas, improve air quality, increase energy efficiency and mitigate the impacts of climate change. Linde continues to develop new applications that can lower emissions, including GHG emissions, in Linde's processes and help customers lower energy consumption and increase product throughput. Stricter regulation of water quality in emerging economies such as China provide a growing market for a number of gases, e.g., oxygen for wastewater treatment. Increased concern about drought in areas such as California and Australia may create additional markets for carbon dioxide for desalination. Renewable fuel standards in the European Union and U.S. create a market for second-generation biofuels which use industrial gases such as oxygen, carbon dioxide, and hydrogen.

Costs Relating to the Protection of the Environment

Environmental protection costs in 2020 were not significant. Linde anticipates that future annual environmental protection expenditures will be similar to 2020, subject to any significant changes in existing laws and regulations. Based on historical results and current estimates, management does not believe that environmental expenditures will have a material adverse effect on the consolidated financial position, the consolidated results of operations or cash flows in any given year.

Legal Proceedings

See Note 17 to the consolidated financial statements for information concerning legal proceedings.

Retirement Benefits

Pensions

The net periodic benefit cost (benefit) for the U.S. and international pension plans was a benefit of $28 million in 2020 and costs of $107 million and $24 million in 2019 and 2018, respectively. 2019 net periodic pension cost included pension settlement charges of $97 million related to lump sum payments, which were triggered by either a change in control provision or merger-related divestitures, and a net curtailment charge of $8 million for termination benefits, primarily in connection with a defined benefit pension plan freeze. Settlement charges were $6 million and $14 million for 2020 and 2018, respectively.

The funded status (pension benefit obligation ("PBO") less the fair value of plan assets) for the U.S. plans was a deficit of $436 million and $504 million at December 31, 2020 and 2019, respectively. The funded status for international plans was a deficit of $2,334 million and $1,801 million at December 31, 2020 and 2019, respectively. In the U.S., the benefit from the actual return on assets more than offset the impact of unfavorable liability experience, primarily resulting from the low discount rate environment. For the international plans, the unfavorable impact of lower discount rates outweighed favorable plan asset returns.

Global pension contributions were $91 million in 2020, $94 million in 2019, and $87 million in 2018. At a minimum, Linde contributes to its pension plans to comply with local regulatory requirements (e.g., ERISA in the U.S.). Discretionary contributions in excess of the local minimum requirements are made based on many factors, including long-term projections of the plans' funded status, the economic environment, potential risk of overfunding, pension insurance costs and alternative uses of cash. Changes to these factors can impact the timing of discretionary contributions from year to year. Estimated required contributions for 2021 are currently expected to be in the range of $70 million to $80 million.

Linde assumes expected returns on plan assets for 2021 of 7.00% and 5.27% for the U.S. and international plans, respectively, which are consistent with the long-term expected returns on its investment portfolios.

Excluding the impact of any settlements, 2021 consolidated pension expense is expected to be a benefit of approximately $36 million. The benefit derived from the expected return on assets assumption for Linde's most significant plans is anticipated to more than offset the expense from service and interest cost accruals and the higher amortization of deferred losses.

Refer to the Critical Accounting Policies section and Note 16 to the consolidated financial statements for a more detailed discussion of the company’s retirement benefits, including a description of the various retirement plans and the assumptions used in the calculation of net periodic benefit cost (benefit) and funded status.

Insurance

Linde purchases insurance to limit a variety of property and casualty risks, including those related to property, business interruption, third-party liability and workers’ compensation. Currently, the company self retains up to $10 million per occurrence for vehicle liability in the United States, $5 million per occurrence for workers' compensation and general liability. In addition, the company self retains risk up to €5 million at its various properties worldwide for property damage resulting from fire, flood and other perils effecting its properties along with a separate €5 million deductible on all business interruption resulting from a major peril loss. To mitigate its aggregate loss potential above these retentions, the company purchases catastrophic insurance coverage from highly rated insurance companies. The company does not currently operate or participate in any captive insurance companies or other non-traditional risk transfer alternatives.

At December 31, 2020 and 2019, the company had recorded a total of $71 million and $66 million, respectively, representing an estimate of the retained liability for the ultimate cost of claims incurred and unpaid as of the balance sheet dates. The estimated liability is established using statistical analysis and is based upon historical experience, actuarial assumptions and professional judgment. These estimates are subject to the effects of trends in loss severity and frequency and are subject to a significant degree of inherent variability. If actual claims differ from the company’s estimates, they will be adjusted at that time and financial results could be impacted.

Linde recognizes estimated insurance proceeds relating to damages at the time of loss only to the extent of incurred losses. Any insurance recoveries for business interruption and for property damages in excess of the net book value of the property are recognized only when realized or pending payments confirmed by its insurance companies.

SEGMENT DISCUSSION

Linde’s operations consist of two major product lines: industrial gases and engineering. As further described in the following paragraph, Linde’s industrial gases operations are managed on a geographic basis, which represents three of the company's reportable segments - Americas, EMEA (Europe/Middle East/Africa), and APAC (Asia/South Pacific); a fourth reportable segment which represents the company's Engineering business, designs and manufactures equipment for air separation and other industrial gas applications specifically for end customers and is managed on a worldwide basis operating in all geographic segments. Other consists of corporate costs and a few smaller businesses which individually do not meet the quantitative thresholds for separate presentation.

The industrial gases product line centers on the manufacturing and distribution of atmospheric gases (oxygen, nitrogen, argon, rare gases) and process gases (carbon dioxide, helium, hydrogen, electronic gases, specialty gases, acetylene). Many of these products are co-products of the same manufacturing process. Linde manufactures and distributes nearly all of its products and manages its customer relationships on a regional basis. Linde’s industrial gases are distributed to various end-markets within a regional segment through one of three basic distribution methods: on-site or tonnage; merchant or bulk; and packaged or cylinder gases. The distribution methods are generally integrated in order to best meet the customer’s needs and very few of its products can be economically transported outside of a region. Therefore, the distribution economics are specific to the various geographies in which the company operates and are consistent with how management assesses performance.

The company’s measure of profit/loss for segment reporting purposes is segment operating profit. Segment operating profit is defined as operating profit excluding purchase accounting impacts of the Linde AG merger, intercompany royalties, and items not indicative of ongoing business trends. This is the manner in which the company’s Chief Operating Decision Maker ("CODM") assesses performance and allocates resources.

The table below presents sales and operating profit information about reportable segments and Other for the years ended December 31, 2020 and 2019.

(Millions of dollars) Year Ended December 31,		2020		2019	Variance
Sales					
Americas	$	10,459	$	10,989	(5)%
EMEA		6,449		6,643	(3)%
APAC		5,687		5,779	(2)%
Engineering		2,851		2,799	2 %
Other		1,797		1,953	(8)%
Total segment sales	$	27,243	$	28,163	(3)%
Merger-related divestitures		—		65	
Total Sales	$	27,243	$	28,228	
Operating Profit					
Americas	$	2,773	$	2,577	8 %
EMEA		1,465		1,367	7 %
APAC		1,277		1,184	8 %
Engineering		435		390	12 %
Other		(153)		(246)	38 %
Segment operating profit		5,797		5,272	10 %
Reconciliation to reported operating profit :					
Cost reduction programs and other charges (Note 3)		(506)		(567)	
Merger-related divestitures		—		16	
Net gain on sale of businesses		—		164	
Purchase accounting impacts - Linde AG		(1,969)		(1,952)	
Total operating profit	$	3,322	$	2,933	

Americas

(Dollar amounts in millions)			Variance
Year Ended December 31,	2020	2019	2020 vs. 2019
Sales	$ 10,459	$ 10,989	(5)%
Operating profit	$ 2,773	$ 2,577	8 %
As a percent of sales	26.5 %	23.5 %	

	2020 vs. 2019
	% Change
Factors Contributing to Changes - Sales	
Volume	(2)%
Price/Mix	2 %
Cost pass-through	(1)%
Currency	(3)%
Acquisitions/Divestitures	(1)%
	(5)%

The Americas segment includes Linde's industrial gases operations in approximately 20 countries including the United States, Canada, Mexico and Brazil.

Sales

Sales for the Americas segment decreased $530 million, or 5%, in 2020 versus 2019. Higher pricing contributed 2% to sales. Lower volumes, primarily related to the manufacturing and metals end markets, of 2%, were partially offset by new project start-ups and higher volumes related to the healthcare end market. Unfavorable currency translation decreased sales by 3%, primarily driven by the weakening of the Brazilian real, Mexican peso and Canadian dollar against the U.S. Dollar. Lower cost past-through, primarily natural gas, decreased sales by 1% with minimal impact on operating profit.

Operating Profit

Operating profit in the Americas segment increased $196 million, or 8%, in 2020 versus 2019. Operating profit increased due primarily to higher pricing and cost reduction and productivity initiatives, partially offset by lower volumes and unfavorable currency translation impacts.

EMEA

(Dollar amounts in millions)			Variance
Year Ended December 31,	2020	2019	2020 vs. 2019
Sales	$ 6,449	$ 6,643	(3)%
Operating profit	$ 1,465	$ 1,367	7 %
As a percent of sales	22.7 %	20.6 %	

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	2020 vs. 2019
	% Change
Factors Contributing to Changes - Sales	
Volume	(3)%
Price/Mix	2 %
Cost pass-through	(1)%
Currency	— %
Acquisitions/Divestitures	(1)%
	(3)%

The EMEA segment includes Linde's industrial gases operations in approximately 45 European, Middle Eastern and African countries including Germany, France, Sweden, the Republic of South Africa, and the U.K.

Sales

EMEA segment sales decreased $194 million, or 3%, in 2020 versus 2019. Volumes decreased 3% driven by lower volumes to the manufacturing and metals end-markets. Higher price contributed 2% to sales and cost pass-through decreased sales by 1%. Sales decreased 1% related to the divestiture of a non-core business in Scandinavia.

Operating Profit

Operating Profit for the EMEA segment increased $98 million, or 7%, in 2020 versus 2019 driven primarily by higher price and the impact of cost reduction programs, partially offset by lower volumes.

APAC

(Dollar amounts in millions)			Variance
Year Ended December 31,	2020	2019	2020 vs. 2019
Sales	$ 5,687	$ 5,779	(2)%
Operating profit	$ 1,277	$ 1,184	8 %
As a percent of sales	22.5 %	20.5 %	

	2020 vs. 2019
	% Change
Factors Contributing to Changes - Sales	
Volume/Equipment	(2)%
Price/Mix	1 %
Cost pass-through	(1)%
Currency	— %
Acquisitions/Divestitures	— %
	(2)%

The APAC segment includes Linde's industrial gases operations in approximately 20 Asian and South Pacific countries and regions including China, Australia, India, South Korea and Taiwan.

Sales

Sales for the APAC segment decreased $92 million, or 2%, in 2020 versus 2019. Volumes decreased 2% as lower volumes to the manufacturing end-market and a prior year equipment sale more than offset the contribution of new project start-ups. Higher price increased sales by 1%. Cost pass-through decreased sales by 1% with minimal impact on operating profit.

Operating Profit

Operating profit in the APAC segment increased $93 million, or 8%, in 2020 versus 2019, driven primarily by higher price and the impact of cost reduction programs, partially offset by lower volumes.

Engineering

(Dollar amounts in millions)			Variance
Year Ended December 31,	2020	2019	2020 vs. 2019
Sales	$ 2,851	$ 2,799	2 %
Operating profit	$ 435	$ 390	12 %
As a percent of sales	15.3 %	13.9 %	

	2020 vs. 2019
	% Change
Factors Contributing to Changes - Sales	
Volume/Price	— %
Currency	2 %
	2 %

Sales

Engineering segment sales increased $52 million, or 2%, in 2020 versus 2019, driven by favorable currency impacts.

Operating profit

Engineering segment operating profit increased $45 million, or 12%, in 2020 versus 2019. The increase in operating profit for the year is due to project execution and the impact of productivity initiatives.

Other

(Dollar amounts in millions)			Variance
Year Ended December 31,	2020	2019	2020 vs. 2019
Sales	$ 1,797	$ 1,953	(8)%
Operating profit	$ (153)	$ (246)	38 %
As a percent of sales	(8.5)%	(12.6)%	

	2020 vs. 2019
	% Change
Factors Contributing to Changes - Sales	
Volume/Price	(9)%
Cost pass-through	1 %
Currency	— %
Acquisitions/Divestitures	— %
	(8)%

Other consists of corporate costs and a few smaller businesses including: Surface Technologies, GIST, global helium wholesale, and Electronic Materials; which individually do not meet the quantitative thresholds for separate presentation.

Sales

Sales for Other decreased $156 million, or 8%, in 2020 versus 2019, primarily due to lower volumes largely due to surface technologies and to a lesser extent helium, partially offset by higher price largely related to helium and cost pass through.

Operating profit

Operating profit in Other increased $93 million, or 38%, in 2020 versus 2019, due primarily to the impact of cost reduction and productivity initiatives.

Currency

The results of Linde's non-U.S. operations are translated to the company's reporting currency, the U.S. dollar, from the functional currencies used in the countries in which the company operates. For most foreign operations, Linde uses the local currency as its functional currency. There is inherent variability and unpredictability in the relationship of these functional currencies to the U.S. dollar and such currency movements may materially impact Linde's results of operations in any given period.

To help understand the reported results, the following is a summary of the significant currencies underlying Linde's consolidated results and the exchange rates used to translate the financial statements (rates of exchange expressed in units of local currency per U.S. dollar):

	Percent of 2020	Statements of Income		Balance Sheets	
	Consolidated	Average Year Ended December 31,		December 31,	
Currency	**Sales**	**2020**	**2019**	**2020**	**2019**
Euro	22 %	0.88	0.89	0.82	0.89
Chinese yuan	8 %	6.90	6.90	6.53	6.96
British pound	6 %	0.78	0.78	0.73	0.75
Australian dollar	4 %	1.45	1.44	1.30	1.42
Brazilian real	3 %	5.11	3.94	5.20	4.03
Canadian dollar	3 %	1.34	1.33	1.27	1.30
Taiwan dollar	3 %	29.46	30.90	28.09	29.99
Mexican peso	2 %	21.35	19.24	19.91	18.93
Korean won	2 %	1,178	1,165	1,087	1,156
Indian rupee	2 %	74.08	70.40	73.07	71.38
Republic of South African rand	1 %	16.37	14.43	14.69	14.00
Swedish kroner	1 %	9.18	9.45	8.23	9.37
Thailand bhat	1 %	31.28	31.04	29.96	29.71

LIQUIDITY, CAPITAL RESOURCES AND OTHER FINANCIAL DATA

(Millions of dollars) Year Ended December 31,	2020	2019
Net Cash Provided by (Used for)		
Operating Activities		
Income from continuing operations (including noncontrolling interests)	$ 2,622	$ 2,272
Non-cash charges (credits):		
Add: Cost reduction programs and other charges, net of payments (a)	258	(236)
Add: Amortization of merger-related inventory step-up	—	12
Less: Net gain on sale of businesses, net of tax	—	(108)
Add: Depreciation and amortization	4,626	4,675
Add (Less): Deferred income taxes	(369)	(303)
Add (Less): non-cash charges and other	285	(32)
Income from continuing operations adjusted for non-cash charges and other	7,422	6,280
Less: Pension contributions	(91)	(94)
Add (Less): Working capital	364	(160)
Add (Less): Other	(266)	93
Net cash provided by operating activities	$ 7,429	$ 6,119
Investing Activities		
Capital expenditures	$ (3,400)	$ (3,682)
Acquisitions, net of cash acquired	(68)	(225)
Divestitures and asset sales, net of cash divested	482	5,096
Net cash provided by (used for) investing activities	$ (2,986)	$ 1,189
Financing Activities		
Debt increases (decreases) – net	$ 1,313	$ (1,260)
Issuances (purchases) of ordinary shares – net	(2,410)	(2,586)
Cash dividends – Linde plc shareholders	(2,028)	(1,891)
Noncontrolling interest transactions and other	(220)	(3,260)
Net cash (used) for financing activities	$ (3,345)	$ (8,997)
Effect of exchange rate changes on cash	$ (44)	$ (77)
Cash and cash equivalents, end-of-period	$ 3,754	$ 2,700

(a) See Note 3 to the consolidated financial statements.

Cash increased $1,054 million in 2020 versus 2019. The primary sources of cash in 2020 were cash flows from operations of $7,429 million, net debt issuances of $1,313 million and proceeds from divestitures and asset sales of $482 million. The primary uses of cash included capital expenditures of $3,400 million, net purchases of ordinary shares of $2,410 million, and cash dividends to shareholders of $2,028 million. Noncontrolling interest transactions and other of $3,260 million in 2019 included a payment of approximately $3.2 billion related to the cash-merger squeeze-out of the 8% of Linde AG shares completed on April 8, 2019 (see Note 14 to the consolidated financial statements).

Cash Flows From Operations

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2020 compared with 2019

Cash flows from operations was $7,429 million, or 27% of sales, an increase of $1,310 million from $6,119 million, or 22% of sales in 2019. The increase was driven by higher net income adjusted for non-cash charges, better working capital management, and lower merger and synergy related cash outflows. Cost reduction programs and other charges of $506 million and $567 million for the years ended December 31, 2020 and 2019 were offset by related cash outflows of $248 million and $803 million, respectively.

Investing

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2020 compared with 2019

Net cash used for investing activities was $2,986 million in 2020 versus net cash provided by investing activities of $1,189 million in 2019. The decrease was primarily driven by lower proceeds from merger-related divestitures, partially offset by lower capital expenditures and acquisitions.

Capital expenditures in 2020 were $3,400 million, a decrease of $282 million from 2019. Capital expenditures during 2020 related primarily to investments in new plant and production equipment for growth. Approximately 41% of the capital expenditures were in the Americas segment with 35% in the APAC segment and the rest primarily in the EMEA segment.

At December 31, 2020, Linde's sale of gas backlog of large projects under construction was approximately $3.6 billion. This represents the total estimated capital cost of large plants under construction.

Acquisition expenditures in 2020 were $68 million, a decrease of $157 million from 2019 and related primarily to acquisitions in the Americas and APAC.

Divestitures and asset sales in 2020 totaled $482 million as compared to $5,096 million in 2019. The 2020 period includes net proceeds from merger-related divestitures of $98 million from the sale of selected assets of Linde China and proceeds of approximately $130 million related to the divestiture of a non-core business in Scandinavia. The 2019 period includes net proceeds from merger-related divestitures of $3.4 billion from the sale of Linde AG's Americas business, $1.2 billion from the sale of Linde South Korea and approximately $200 million each from the sale of the legacy Praxair and legacy Linde India selected assets (see Note 2 to the consolidated financial statements).

Financing

Linde's financing strategy is to secure long-term committed funding by issuing public notes and debentures and commercial paper backed by a long-term bank credit agreement. Linde's international operations are funded through a combination of local borrowing and intercompany funding to minimize the total cost of funds and to manage and centralize currency exchange exposures. As deemed necessary, Linde manages its exposure to interest-rate changes through the use of financial derivatives (see Note 12 to the consolidated financial statements and Item 7A. Quantitative and Qualitative Disclosures About Market Risk).

Cash used for financing activities was $3,345 million in 2020 compared to $8,997 million in 2019. Cash provided by debt was $1,313 million in 2020 versus cash used for debt of $1,260 million in 2019 primarily due to bond issuances in 2020 and increased commercial paper borrowings, net of bond repayments. Net purchases of ordinary shares were $2,410 million in 2020 versus $2,586 million in 2019. Cash dividends increased to $2,028 million in 2020 versus $1,891 million in 2019 driven primarily by a 10% increase in dividends per share from $3.50 per share to $3.85 per share. The 2019 period also includes an outflow of approximately $3.2 billion relating to the cash-merger squeeze-out of the 8% of Linde AG shares completed on April 8, 2019 (See Note 14 to the consolidated financial statements).

The company believes that it has sufficient operating flexibility, cash reserves, and funding sources to maintain adequate amounts of liquidity to meet its business needs around the world. At December 31, 2020, Linde's credit ratings as reported by Standard & Poor’s and Moody’s were A-1 and P-1 for short-term debt, respectively, and A and A2 for long-term debt, respectively.

Note 11 to the consolidated financial statements includes information with respect to the company’s debt activity in 2020, current debt position, debt covenants and the available credit facilities; and Note 12 includes information relating to derivative financial instruments. Linde's credit facilities are with major financial institutions and are non-cancelable until maturity. Therefore, the company believes the risk of the financial institutions being unable to make required loans under the credit facilities, if requested, to be low. Linde’s major bank credit and long-term debt agreements contain standard covenants. The company was in compliance with these covenants at December 31, 2020 and expects to remain in compliance for the foreseeable future.

The company maintains a $5 billion unsecured and undrawn revolving credit agreement with no associated financial covenants. No borrowings were outstanding under the credit agreement as of December 31, 2020. The company does not anticipate any limitations on its ability to access the debt capital markets and/or other external funding sources and remains committed to its strong ratings from Moody’s and Standard & Poor’s.

Linde’s total net debt outstanding at December 31, 2020 was $12,400 million, $1,144 million higher than $11,256 million at December 31, 2019. The December 31, 2020 net debt balance includes $15,048 million in public securities, $1,106 million representing primarily worldwide bank borrowings, net of $3,754 million of cash. Linde’s global effective borrowing rate was approximately 2% for 2020.

In May 2020, Linde issued €750 million of 0.250% notes due 2027 and €750 million 0.550% notes due 2032. In August, 2020, Linde issued $700 million of 1.100% notes due 2030 and $300 million of 2.000% notes due 2050. In September 2020, the company repaid €1,000 million in 1.75% notes and $300 million of 2.25% notes that became due. In December 2020, the company repaid $500 million of 4.05% notes and $500 million of 3.00% notes that were due in 2021 resulting in a $16 million interest charge (see Note 11 to the consolidated financial statements).

On January 25, 2021, the company’s board of directors approved the additional repurchase of $5.0 billion of its ordinary shares. For additional information related to the share repurchase programs, see Part II Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities.

OFF-BALANCE SHEET ARRANGEMENTS

As discussed in Note 17 to the consolidated financial statements, at December 31, 2020, Linde had undrawn outstanding letters of credit, bank guarantees and surety bonds entered into in connection with normal business operations and they are not reasonably likely to have a material impact on Linde’s consolidated financial condition, results of operations, or liquidity.

CRITICAL ACCOUNTING POLICIES

The policies discussed below are considered by management to be critical to understanding Linde’s financial statements and accompanying notes prepared in accordance with accounting principles generally accepted in the United States ("U.S. GAAP"). Their application places significant importance on management’s judgment as a result of the need to make estimates of matters that are inherently uncertain. Linde’s financial position, results of operations and cash flows could be materially affected if actual results differ from estimates made. These policies are determined by management and have been reviewed by Linde’s Audit Committee.

Revenue Recognition

Long-Term Construction Contracts

The company designs and manufactures equipment for air separation and other varied gas production and processing plants manufactured specifically for end customers. Revenue from sale of equipment is generally recognized over time as Linde has an enforceable right to payment for performance completed to date and performance does not create an asset with alternative use. For contracts recognized over time, revenue is recognized primarily using a cost incurred input method. Costs incurred to date relative to total estimated costs at completion are used to measure progress toward satisfying performance obligations. Costs incurred include material, labor, and overhead costs and represent work contributing and proportionate to the transfer of control to the customer. Contract modifications are typically accounted for as part of the existing contract and are recognized as a cumulative adjustment for the inception-to-date effect of such change. We assess performance as progress towards completion is achieved on specific projects, earnings will be impacted by changes to our forecast of revenues and costs on these projects.

Pension Benefits

Pension benefits represent financial obligations that will be ultimately settled in the future with employees who meet eligibility requirements. Because of the uncertainties involved in estimating the timing and amount of future payments, significant estimates are required to calculate pension expense and liabilities related to the company’s plans. The company utilizes the services of independent actuaries, whose models are used to facilitate these calculations.

Several key assumptions are used in actuarial models to calculate pension expense and liability amounts recorded in the financial statements. Management believes the three most significant variables in the models are the expected long-term rate of return on plan assets, the discount rate, and the expected rate of compensation increase. The actuarial models also use assumptions for various other factors, including long-term inflation rates, employee turnover, retirement age, and mortality. Linde management believes the assumptions used in the actuarial calculations are reasonable, reflect the company’s experience and expectations for the future and are within accepted practices in each of the respective geographic locations in which it operates. Actual results in any given year will often differ from actuarial assumptions because of economic and other factors. The sensitivities to each of the key assumptions presented below exclude the impact of special items that occurred during the year.

The weighted-average expected long-term rates of return on pension plan assets were 7.00% for U.S. plans and 5.31% for international plans for the year ended December 31, 2020 (7.27% and 5.15%, respectively at December 31, 2019). The expected long-term rate of return on the U.S. and international plan assets is estimated based on the plans' investment strategy and asset allocation, historical capital market performance and, to a lesser extent, historical plan performance. A 0.50% change in these expected long-term rates of return, with all other variables held constant, would change Linde’s pension expense by approximately $42 million.

The company has consistently used a market-related value of assets rather than the fair value at the measurement date to determine annual pension expense. The market-related value recognizes investment gains or losses over a five-year period. As a result, changes in the fair value of assets from year to year are not immediately reflected in the company's annual pension expense. Instead, annual pension expense in future periods will be impacted as deferred investment gains or losses are recognized in the market-related value of assets over the five-year period. The consolidated market-related value of assets was $9,408 million, or $555 million lower than the fair value of assets of $9,963 million at December 31, 2020. These net deferred investment losses of $555 million will be recognized in the calculation of the market-related value of assets ratably over the next four years and will impact future pension expense. Future actual investment gains or losses will impact the market-related value of assets and, therefore, will impact future annual pension expense in a similar manner.

Discount rates are used to calculate the present value of plan liabilities and pension costs and are determined annually by management. The company measures the service and interest cost components of pension and OPEB expense for significant U.S. and international plans using the spot rate approach. U.S. plans that do not use the spot rate approach continue to determine discount rates by using a cash flow matching model provided by the company's independent actuaries. The model includes a portfolio of corporate bonds graded Aa or better by at least half of the ratings agencies and matches the U.S. plans' projected cash flows to the calculated spot rates. Discount rates for the remaining international plans are based on market yields for high-quality fixed income investments representing the approximate duration of the pension liabilities on the measurement date. Refer to Note 16 to the consolidated financial statements for a summary of the discount rates used to calculate plan liabilities and benefit costs, and to the Retirement Benefits section of the Consolidated Results and Other Information section of this MD&A for a further discussion of 2020 benefit costs. A 0.50% reduction in discount rates, with all other variables held constant, would increase Linde’s pension expense by approximately $42 million whereas a 0.50% increase in discount rates would result in a decrease of $12 million. A 0.50% reduction in discount rates would increase the PBO by approximately $1,054 million whereas a 0.50% increase in discount rates would have a favorable impact to the PBO of approximately $932 million.

The weighted-average expected rate of compensation increase was 3.25% for U.S. plans and 2.55% for international plans at December 31, 2020 (3.25% and 2.46%, respectively, at December 31, 2019). The estimated annual compensation increase is determined by management every year and is based on historical trends and market indices. A 0.50% change in the expected rate of compensation increase, with all other variables held constant, would change Linde’s pension expense by approximately $8 million and would impact the PBO by approximately $70 million.

Asset Impairments

Goodwill and Other Indefinite-Lived Intangibles Assets

At December 31, 2020, the company had goodwill of $28,201 million and $1,992 million of other indefinite-lived intangible assets. Goodwill represents the aggregate of the excess consideration paid for acquired businesses over the fair value of the net assets acquired. Indefinite-lived other intangibles relate to the Linde name.

The company performs a goodwill impairment test annually or more frequently if events or circumstances indicate that an impairment loss may have been incurred.

The impairment tests performed during the fourth quarter of 2020 indicated no impairment. At December 31, 2020, Linde’s enterprise value was approximately $150 billion (outstanding shares multiplied by the year-end stock price plus net debt, and without any control premium) while its total capital was approximately $62 billion.

The impairment test allows an entity to first assess qualitative factors to determine if it is more likely than not that the fair value of a reporting unit is less than carrying value. If it is determined that it is more likely than not that the fair value of a reporting unit is less than carrying value then the company will estimate and compare the fair value of its reporting units to their carrying value, including goodwill. Reporting units are determined based on one level below the operating segment level.

Management believes that the quantitative and qualitative factors used to perform its annual goodwill impairment assessment are appropriate and reasonable. Although the 2020 assessment indicated that it is more likely than not that the fair value of each reporting unit exceeded its carrying value, changes in circumstances or conditions affecting this analysis could have a significant impact on the fair value determination, which could then result in a material impairment charge to the company's results of operations. Reporting units with greater concentration of Linde AG assets fair valued during the 2018 Praxair, Inc. and Linde AG merger are at greater risk of impairment in future periods.

Other indefinite-lived intangible assets from Linde AG recently fair valued are evaluated for impairment on an annual basis or more frequently if events and circumstances indicate that an impairment loss may have been incurred, and no impairments were indicated.

See Notes 9 and 10 to the consolidated financial statements.

Long-Lived Assets

Long-lived assets, including property, plant and equipment and finite-lived other intangible assets, are tested for impairment whenever events or changes in circumstances indicate that the carrying amount of an individual asset or asset group may not be recoverable. For purposes of this test, asset groups are determined based upon the lowest level for which there are independent and identifiable cash flows. Based upon Linde's business model an asset group may be a single plant and related assets used to support on-site, merchant and packaged gas customers. Alternatively, the asset group may a collection of distribution related assets (cylinders, distribution centers, and stores) or be a pipeline complex which includes multiple interdependent plants and related assets connected by pipelines within a geographic area used to support the same distribution methods.

Income Taxes

At December 31, 2020, Linde had deferred tax assets of $2,270 million (net of valuation allowances of $243 million), and deferred tax liabilities of $8,706 million. At December 31, 2020, uncertain tax positions totaled $452 million (see Note 1 and Note 5 to the consolidated financial statements). Income tax expense was $847 million for the year ended December 31, 2020, or about 25.0% of pre-tax income (see Note 5 to the consolidated financial statements for additional information related to taxes).

In the preparation of consolidated financial statements, Linde estimates income taxes based on diverse legislative and regulatory structures that exist in various jurisdictions where the company conducts business. Deferred income tax assets and liabilities represent tax benefits or obligations that arise from temporary differences due to differing treatment of certain items for accounting and income tax purposes. Linde evaluates deferred tax assets each period to ensure that estimated future taxable income will be sufficient in character (e.g. capital gain versus ordinary income treatment), amount and timing to result in their recovery. A valuation allowance is established when management determines that it is more likely than not that a deferred tax asset will not be realized to reduce the assets to their realizable value. Considerable judgments are required in establishing deferred tax valuation allowances and in assessing exposures related to tax matters. As events and circumstances change, related reserves and valuation allowances are adjusted to income at that time. Linde’s tax returns are subject to audit and local taxing authorities could challenge the company’s tax positions. The company’s practice is to review tax filing positions by jurisdiction and to record provisions for uncertain income tax positions, including interest and penalties when applicable. Linde believes it records and/or discloses such potential tax liabilities as appropriate and has reasonably estimated its income tax liabilities and recoverable tax assets. If new information becomes available, adjustments are charged or credited against income at that time. Management does not anticipate that such adjustments would have a material adverse effect on the company’s consolidated financial position or liquidity; however, it is possible that the final outcomes could have a material impact on the company’s reported results of operations.

Contingencies

The company accrues liabilities for non-income tax contingencies when management believes that a loss is probable and the amounts can be reasonably estimated, while contingent gains are recognized only when realized or realizable. If new information becomes available or losses are sustained in excess of recorded amounts, adjustments are charged against income at that time. Management does not anticipate that in the aggregate such losses would have a material adverse effect on the company’s consolidated financial position or liquidity; however, it is possible that the final outcomes could have a material impact on the company’s reported results of operations.

Linde is subject to various claims, legal proceedings and government investigations that arise from time to time in the ordinary course of business. These actions are based upon alleged environmental, tax, antitrust and personal injury claims, among others (see Note 17 to the consolidated financial statements). Such contingencies are significant and the accounting requires considerable management judgments in analyzing each matter to assess the likely outcome and the need for establishing appropriate liabilities and providing adequate disclosures. Linde believes it records and/or discloses such contingencies as appropriate and has reasonably estimated its liabilities.

NEW ACCOUNTING STANDARDS

See Note 1 to the consolidated financial statements for information concerning new accounting standards and the impact of the implementation of these standards on the company’s financial statements.

FAIR VALUE MEASUREMENTS

Linde does not expect changes in the aggregate fair value of its financial assets and liabilities to have a material impact on the consolidated financial statements. See Note 13 to the consolidated financial statements.

NON-GAAP FINANCIAL MEASURES

The following non-GAAP measures are intended to supplement investors' understanding of the company's financial information by providing measures which investors, financial analysts and management use to help evaluate the company's financial leverage and operating performance. Special items which the company does not believe to be indicative of on-going business performance are excluded from these calculations so that investors can better evaluate and analyze historical and future business trends on a consistent basis. Definitions of these non-GAAP measures may not be comparable to similar definitions used by other companies and are not a substitute for similar GAAP measures.

The non-GAAP measures in the following reconciliations are presented in this MD&A.

Adjusted Amounts

(Dollar amounts in millions, except per share data)		
Year Ended December 31,	**2020**	**2019**
Adjusted Sales		
Reported Sales	$ 27,243	$ 28,228
Less: Merger-related divestitures (d)	—	(65)
Adjusted Sales	$ 27,243	$ 28,163
Adjusted Operating Profit and Operating Margin		
Reported operating profit	$ 3,322	$ 2,933
Less: Merger-related divestitures (d)	—	(16)
Add: Cost reduction programs and other charges	506	567
Less: Net gain on sale of businesses	—	(164)
Add: Purchase accounting impacts - Linde AG (c)	1,969	1,952
Total adjustments	2,475	2,339
Adjusted operating profit	$ 5,797	$ 5,272
Reported percentage change	13 %	
Adjusted percentage change	10 %	
Reported sales	$ 27,243	$ 28,228
Adjusted sales	$ 27,243	$ 28,163
Reported operating margin	12.2 %	10.4 %
Adjusted operating margin	21.3 %	18.7 %
Adjusted Depreciation and amortization		
Reported depreciation and amortization	$ 4,626	$ 4,675
Less: Purchase accounting impacts - Linde AG (c)	(1,920)	(1,940)
Adjusted depreciation and amortization	$ 2,706	$ 2,735
Adjusted Other Income (Expense) - net		
Reported Other Income (Expense) - net	$ (61)	$ 68

Add: Purchase accounting impacts - Linde AG (c)		(49)		—
Adjusted Other Income (Expense) - net	$	(12)	$	68
Adjusted Net Pension and OPEB Cost (Benefit), Excluding Service Cost				
Reported net pension and OPEB cost (benefit), excluding service cost	$	(177)	$	(32)
Add: Pension settlement charges		(6)		(107)
Adjusted Net Pension and OPEB cost (benefit), excluding service costs	$	(183)	$	(139)
Adjusted Interest Expense - Net				
Reported interest expense - net	$	115	$	38
Add: Purchase accounting impacts - Linde AG (c)		85		96
Less: Bond Redemption		(16)		—
Adjusted interest expense - net	$	184	$	134
Adjusted Income Taxes (a)				
Reported income taxes	$	847	$	769
Add: Purchase accounting impacts - Linde AG (c)		399		450
Add: Pension settlement charges		1		26
Add: Cost reduction programs and other charges		130		83
Less: Merger-related divestitures (d)		—		(5)
Less: Net gain on sale of businesses		—		(56)
Less: Bond Redemption		4		—
Total adjustments		534		498
Adjusted income taxes	$	1,381	$	1,267
Adjusted Effective Tax Rate (a)				
Reported income before income taxes and equity investments	$	3,384	$	2,927
Less: Merger-related divestitures (d)		—		(16)
Add: Pension settlement charge		6		107
Add: Purchase accounting impacts - Linde AG (c)		1,884		1,856
Add: Cost reduction programs and other charges		506		567
Less: Bond Redemption		16		—
Less: Net gain on sale of businesses		—		(164)
Total adjustments		2,412		2,350
Adjusted income before income taxes and equity investments	$	5,796	$	5,277
Reported Income taxes	$	847	$	769
Reported effective tax rate		25.0 %		26.3 %
Adjusted income taxes	$	1,381	$	1,267
Adjusted effective tax rate		23.8 %		24.0 %
Income from Equity Investments				
Reported income from equity investments	$	85	$	114
Add: Purchase accounting impacts - Linde AG (c)		57		57
Adjusted income from equity investments	$	142	$	171

Adjusted Noncontrolling Interests from Continuing Operations		
Reported noncontrolling interests from continuing operations	$ (125)	$ (89)
Add: Cost reduction programs and other charges	(4)	(35)
Add: Purchase accounting impacts - Linde AG (c)	(57)	(54)
Total adjustments	(61)	(89)
Adjusted noncontrolling interests from continuing operations	$ (186)	$ (178)
Adjusted Income from Continuing Operations (b)		
Reported income from continuing operations	$ 2,497	$ 2,183
Add: Pension settlement charge	5	81
Less: Merger-related divestitures (d)	—	(12)
Add: Cost reduction programs and other charges	372	449
Less: Net gain on sale of business	—	(108)
Add: Purchase accounting impacts - Linde AG (c)	1,485	1,410
Less: Bond Redemption	12	—
Total adjustments	1,874	1,820
Adjusted income from continuing operations	$ 4,371	$ 4,003
Adjusted Diluted EPS from Continuing Operations (b)		
Reported diluted EPS from continuing operations	$ 4.70	$ 4.00
Add: Pension settlement charge	0.01	0.16
Add: Cost reduction programs and other charges	0.70	0.83
Less: Merger-related divestitures (d)	—	(0.03)
Less: Net gain on sale of business	—	(0.21)
Less: Bond Redemption	0.02	—
Add: Purchase accounting impacts - Linde AG	2.80	2.59
Total adjustments	3.53	3.34
Adjusted diluted EPS from continuing operations	$ 8.23	$ 7.34
Reported percentage change	18 %	
Adjusted percentage change	12 %	
Adjusted EBITDA and % of Sales		
Income from continuing operations	$ 2,497	$ 2,183
Add: Noncontrolling interests related to continuing operations	125	89
Add: Net pension and OPEB cost (benefit), excluding service cost	(177)	(32)
Add: Interest expense	115	38
Add: Income taxes	847	769
Add: Depreciation and amortization	4,626	4,675
EBITDA from continuing operations	8,033	7,722
Less: Merger-related divestitures (d)	—	(16)
Less: Net gain on sale of business	—	(164)
Add: Cost reduction programs and other charges	506	567
Add: Purchase accounting impacts - Linde AG	106	69

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Total adjustments	612	456
Adjusted EBITDA from continuing operations	$ 8,645	$ 8,178
Reported sales	$ 27,243	$ 28,228
Adjusted sales	$ 27,243	$ 28,163
% of sales		
EBITDA from continuing operations	29.5 %	27.4 %
Adjusted EBITDA from continuing operations	31.7 %	29.0 %

(a) The income tax expense (benefit) on the non-GAAP pre-tax adjustments was determined using the applicable tax rates for the jurisdictions that were utilized in calculating the GAAP income tax expense (benefit) and included both current and deferred income tax amounts.

(b) Net of income taxes which are shown separately in “Adjusted Income Taxes and Effective Tax Rate”.

(c) The company believes that its non-GAAP measures excluding Purchase accounting impacts - Linde AG are useful to investors because: (i) the business combination was a merger of equals in an all-stock merger transaction, with no cash consideration, (ii) the company is managed on a geographic basis and the results of certain geographies are more heavily impacted by purchase accounting than others, causing results that are not comparable at the reportable segment level, therefore, the impacts of purchasing accounting adjustments to each segment vary and are not comparable within the company and when compared to other companies in similar regions, (iii) business management is evaluated and variable compensation is determined based on results excluding purchase accounting impacts, and; (iv) it is important to investors and analysts to understand the purchase accounting impacts to the financial statements.

A summary of each of the adjustments made for Purchase accounting impacts - Linde AG are as follows:
Adjusted Operating Profit and Margin: The purchase accounting adjustments for the periods presented relate primarily to depreciation and amortization related to the fair value step up of fixed assets and intangible assets (primarily customer related) acquired in the merger and the allocation of fair value step-up for ongoing Linde AG asset disposals (reflected in Other Income/(Expense)).
Adjusted Interest Expense - Net: Relates to the amortization of the fair value of debt acquired in the merger.
Adjusted Income Taxes and Effective Tax Rate: Relates to the current and deferred income tax impact on the adjustments discussed above. The income tax expense (benefit) on the non-GAAP pre-tax adjustments was determined using the applicable tax rates for the jurisdictions that were utilized in calculating the GAAP income tax expense (benefit) and included both current and deferred income tax amounts.
Adjusted Income from Equity Investments: Represents the amortization of increased fair value on equity investments related to depreciable and amortizable assets.
Adjusted Noncontrolling Interests from Continuing Operations: Represents the noncontrolling interests’ ownership portion of the adjustments described above determined on an entity by entity basis.

(d) To adjust for the results of Praxair's merger-related divestitures.

Net Debt and Adjusted Net Debt

Net debt is a financial liquidity measure used by investors, financial analysts and management to evaluate the ability of a company to repay its debt. Purchase accounting impacts have been excluded as they are non-cash and do not have an impact on liquidity.

(Millions of dollars)	December 31, 2020	December 31, 2019
Debt	$ 16,154	$ 13,956
Less: cash and cash equivalents	(3,754)	(2,700)
Net debt	12,400	11,256
Less: purchase accounting impacts - Linde AG	(121)	(195)
Adjusted net debt	$ 12,279	$ 11,061

SUPPLEMENTAL GUARANTEE INFORMATION

On June 6, 2020, the company filed a Form S-3 Registration Statement with the SEC (the "Registration Statement").

Linde plc may offer debt securities, preferred shares, depositary shares and ordinary shares under the Registration Statement, and debt securities exchangeable for or convertible into preferred shares, ordinary shares or other debt securities. Debt securities of Linde plc may be guaranteed by Linde Inc. (previously Praxair, Inc.) and/or Linde GmbH (previously Linde AG). Linde plc may provide guarantees of debt securities offered by its wholly owned subsidiaries Linde, Inc. or Linde Finance under the Registration Statement.

Linde Inc. is a wholly owned subsidiary of Linde plc. Linde Inc. may offer debt securities under the Registration Statement. Debt securities of Linde Inc. will be guaranteed by Linde plc, and such guarantees by Linde plc may be guaranteed by Linde GmbH. Linde, Inc. may also provide (i) guarantees of debt securities offered by Linde plc under the Registration Statement and (ii) guarantees of the guarantees provided by Linde plc of debt securities of Linde Finance offered under the Registration Statement.

Linde Finance B.V. is a wholly owned subsidiary of Linde plc. Linde Finance may offer debt securities under the Registration Statement. Linde plc will guarantee debt securities of Linde Finance offered under the Registration Statement. Linde GmbH and Linde, Inc. may guarantee Linde plc’s obligations under its downstream guarantee.

Linde GmbH is a wholly owned subsidiary of Linde plc. Linde GmbH may provide (i) guarantees of debt securities offered by Linde plc under the Registration Statement and (ii) upstream guarantees of downstream guarantees provided by Linde plc of debt securities of Linde, Inc. or Linde Finance offered under the Registration Statement.

In September 2019, Linde plc provided downstream guarantees of all of the pre-business combination Linde, Inc. and Linde Finance notes, and Linde GmbH and Linde, Inc., respectively, provided upstream guarantees of Linde plc’s downstream guarantees.

For further information about the guarantees of the debt securities registered under the Registration Statement (including the ranking of such guarantees, limitations on enforceability of such guarantees and the circumstances under which such guarantees may be released), see “Description of Debt Securities – Guarantees” and “Description of Debt Securities – Ranking” in the Registration Statement, which subsections are incorporated herein by reference.

The company has elected to comply with Rule 13-01 of SEC Regulation S-X in advance of the effective date of January 4, 2021, as permitted by the Adopting Release.

The following tables present summarized financial information for Linde plc, Linde, Inc., Linde GmbH and Linde Finance on a combined basis, after eliminating intercompany transactions and balances between them and excluding investments in and equity in earnings from non-guarantor subsidiaries.

(Millions of dollars)				
Statement of Income Data	Twelve Months Ended December 31, 2020		Twelve Months Ended December 31, 2019	
Sales	$	6,772	$	6,510
Operating profit		760		592
Net income		660		2,271
Transactions with non-guarantor subsidiaries		2,082		3,533
Balance Sheet Data (at period end)				
Current assets (a)	$	3,117	$	2,137
Long-term assets (b)		17,892		20,421
Current liabilities (c)		8,265		6,897
Long-term liabilities (d)		38,188		35,338
(a) From current assets above, amount due from non-guarantor subsidiaries	$	937	$	619
(b) From long-term assets above, amount due from non-guarantor subsidiaries		4,553		7,725
(c) From current liabilities above, amount due to non-guarantor subsidiaries		1,053		737
(d) From long-term liabilities above, amount due to non-guarantor subsidiaries		22,419		21,242

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Linde is exposed to market risks relating to fluctuations in interest rates and currency exchange rates. The objective of financial risk management at Linde is to minimize the negative impact of interest rate and foreign exchange rate fluctuations on the company's earnings, cash flows and equity.

To manage these risks, Linde uses various derivative financial instruments, including interest-rate swaps, treasury rate locks, currency swaps, forward contracts, and commodity contracts. Linde only uses commonly traded and non-leveraged instruments. These contracts are entered into primarily with major banking institutions thereby minimizing the risk of credit loss. Also, see Note 1 and Note 12 to the consolidated financial statements for a more complete description of Linde's accounting policies and use of such instruments.

The following discussion presents the sensitivity of the market value, earnings and cash flows of Linde's financial instruments to hypothetical changes in interest and exchange rates assuming these changes occurred at December 31, 2020. The range of changes chosen for these discussions reflects Linde's view of changes which are reasonably possible over a one-year period. Market values represent the present values of projected future cash flows based on interest rate and exchange rate assumptions.

Interest Rate Risk

At December 31, 2020, Linde had debt totaling $16,154 million ($13,956 million at December 31, 2019). For fixed-rate instruments, interest rate changes affect the fair market value but do not impact earnings or cash flows. Conversely, for floating-rate instruments, interest rate changes generally do not affect the fair market value of the instrument but impact future earnings and cash flows, assuming that other factors are held constant. At December 31, 2020, including the impact of derivatives, Linde had fixed-rate debt of $10,365 million and floating-rate debt of $5,789 million, representing 64% and 36%, respectively, of total debt. At December 31, 2019, Linde had fixed-rate debt of $10,799 million and floating-rate debt of $3,157 million, representing 77% and 23%, respectively, of total debt.

Fixed Rate Debt

In order to mitigate interest rate risk, when considered appropriate, interest-rate swaps are entered into as hedges of underlying financial instruments to effectively change the characteristics of the interest rate without actually changing the underlying financial instrument. At December 31, 2020, Linde had fixed-to-floating interest rate swaps outstanding that were designated as hedging instruments of the underlying debt issuances - refer to Note 12 to the consolidated financial statements for additional information. This sensitivity analysis assumes that, holding all other variables constant (such as foreign exchange rates, swaps and debt levels), a one hundred basis point increase in interest rates would decrease the unrealized fair market value of the fixed-rate debt portfolio by approximately $674 million ($473 million in 2019). A one hundred basis point increase in interest rates would result in an approximate $61 million increase to derivative assets recorded.

Variable Rate Debt

At December 31, 2020, the after-tax earnings and cash flows impact of a one hundred basis point increase in interest rates, including offsetting impact of derivatives, on the variable-rate debt portfolio would be approximately $44 million ($48 million in 2019).

Foreign Currency Risk

Linde's exchange-rate exposures result primarily from its investments and ongoing operations in Latin America (primarily Brazil and Mexico), Europe (primarily Germany, Scandinavia, and the U.K.), Canada, Asia Pacific (primarily Australia and China) and other business transactions such as the procurement of equipment from foreign sources. Linde frequently utilizes currency contracts to hedge these exposures. At December 31, 2020, Linde had a notional amount outstanding of $7,553 million ($9,713 million at December 31, 2019) related to foreign exchange contracts. The majority of these were to hedge recorded balance sheet exposures, primarily intercompany loans denominated in non-functional currencies. See Note 12 to the consolidated financial statements.

Holding all other variables constant, if there were a 10% increase in foreign-currency exchange rates for the portfolio, the fair market value of foreign-currency contracts outstanding at December 31, 2020 would decrease by approximately $99 million and at December 31, 2019 would increase by approximately $194 million, which would be largely offset by an offsetting loss or gain on the foreign-currency fluctuation of the underlying exposure being hedged.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

MANAGEMENT'S STATEMENT OF RESPONSIBILITY FOR FINANCIAL STATEMENTS

Linde's consolidated financial statements are prepared by management, which is responsible for their fairness, integrity and objectivity. The accompanying financial statements have been prepared in conformity with accounting principles generally accepted in the United States of America applied on a consistent basis, except for accounting changes as disclosed, and include amounts that are estimates and judgments. All historical financial information in this annual report is consistent with the accompanying financial statements.

Linde maintains accounting systems, including internal accounting controls, monitored by a staff of internal auditors, that are designed to provide reasonable assurance of the reliability of financial records and the protection of assets. The concept of reasonable assurance is based on recognition that the cost of a system should not exceed the related benefits. The effectiveness of those systems depends primarily upon the careful selection of financial and other managers, clear delegation of authority and assignment of accountability, inculcation of high business ethics and conflict-of-interest standards, policies and procedures for coordinating the management of corporate resources, and the leadership and commitment of top management. In compliance with Section 404 of the Sarbanes-Oxley Act of 2002, Linde assessed its internal control over financial reporting and issued a report (see below).

The Audit Committee of the Board of Directors, which consists solely of non-employee directors, is responsible for overseeing the functioning of the accounting system and related controls and the preparation of annual financial statements. The Audit Committee periodically meets with management, internal auditors and the independent accountants to review and evaluate their accounting, auditing and financial reporting activities and responsibilities, including management's assessment of internal control over financial reporting. The independent registered public accounting firm and internal auditors have full and free access to the Audit Committee and meet with the committee, with and without management present.

MANAGEMENT'S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING

Linde's management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Exchange Act Rule 13a-15(f). Under the supervision and with the participation of management, including the company's principal executive officer and principal financial officer, the company conducted an evaluation of the effectiveness of its internal control over financial reporting based on the framework in *Internal Control – Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (often referred to as COSO). Based on this evaluation, management concluded that the company's internal control over financial reporting was effective as of December 31, 2020.

PricewaterhouseCoopers LLP, an independent registered public accounting firm, has audited and issued their opinion on the effectiveness of the company's internal control over financial reporting as of December 31, 2020 as stated in their report.

/s/ STEPHEN F. ANGEL	/s/ KELCEY E. HOYT
Stephen F. Angel **Chief Executive Officer**	**Kelcey E. Hoyt** **Chief Accounting Officer**
/s/ MATTHEW J. WHITE	
Matthew J. White **Chief Financial Officer**	March 1, 2021

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Shareholders of Linde plc

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Linde plc and its subsidiaries (the "Company") as of December 31, 2020 and 2019, and the related consolidated statements of income, of comprehensive income, of equity and of cash flows for each of the three years in the period ended December 31, 2020, including the related notes (collectively referred to as the "consolidated financial statements"). We also have audited the Company's internal control over financial reporting as of December 31, 2020, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2020 and 2019, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2020 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2020, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the COSO.

Basis for Opinions

The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Report on Internal Control Over Financial Reporting. Our responsibility is to express opinions on the Company's consolidated financial statements and on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Critical Audit Matters

The critical audit matter communicated below is a matter arising from the current period audit of the consolidated financial statements that was communicated or required to be communicated to the audit committee and that (i) relates to accounts or disclosures that are material to the consolidated financial statements and (ii) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing a separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

Revenue Recognition - Estimated Costs at Completion

As described in Note 19 to the consolidated financial statements, $2,851 million of the Company’s total revenues for the year ended December 31, 2020 was generated from the sale of equipment contracts. Sale of equipment contracts are generally comprised of a single performance obligation. Revenue from sale of equipment is generally recognized over time as the Company has an enforceable right to payment for performance completed to date and performance does not create an asset with alternative use. For contracts recognized over time, revenue is recognized primarily using a cost incurred input method. Costs incurred to date relative to total estimated costs at completion are used to measure progress toward satisfying performance obligations. Costs incurred include material, labor, and overhead costs and represent work contributing and proportionate to the transfer of control to the customer.

The principal considerations for our determination that performing procedures relating to revenue recognition - estimated costs at completion is a critical audit matter are (i) the significant judgment by management when developing the estimated costs at completion for the sale of equipment contracts; (ii) a high degree of auditor judgment, subjectivity, and effort in performing procedures and evaluating audit evidence related to the estimated costs at completion and management’s significant assumptions related to the total estimated material and labor costs; and (iii) the audit effort involved the use of professionals with specialized skill and knowledge.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to the revenue recognition process, including controls over developing the estimated costs at completion for the sale of equipment contracts. These procedures also included, among others, evaluating and testing management’s process for developing the estimated costs at completion for the sale of equipment contracts, which included evaluating the reasonableness of management’s significant assumptions related to the total estimated material and labor costs. Evaluating the reasonableness of management’s significant assumptions involved evaluating management’s ability to reasonably estimate costs at completion for the sale of equipment contracts on a sample basis by (i) performing a comparison of the originally estimated and actual costs incurred on similar completed equipment contracts, and (ii) evaluating the timely identification of circumstances that may warrant a modification to estimated costs at completion, including actual costs in excess of estimates. Professionals with specialized skill and knowledge were used to assist in evaluating the reasonableness of management’s estimates and significant assumptions related to the total estimated material and labor costs.

/s/ PricewaterhouseCoopers LLP
Stamford, Connecticut
March 1, 2021

We have served as the Company’s or its predecessor’s auditor since 1992.

CONSOLIDATED STATEMENTS OF INCOME
LINDE PLC AND SUBSIDIARIES
(Dollar amounts in millions, except per share data)

Year Ended December 31,	2020	2019	2018
Sales	$ 27,243	$ 28,228	$ 14,836
Cost of sales, exclusive of depreciation and amortization	15,383	16,644	9,020
Selling, general and administrative	3,193	3,457	1,629
Depreciation and amortization	4,626	4,675	1,830
Research and development	152	184	113
Cost reduction programs and other charges	506	567	309
Net gain on sale of businesses	—	164	3,294
Other income (expenses) – net	(61)	68	18
Operating Profit	3,322	2,933	5,247
Interest expense – net	115	38	202
Net pension and OPEB cost (benefit), excluding service cost	(177)	(32)	(4)
Income From Continuing Operations Before Income Taxes and Equity Investments	3,384	2,927	5,049
Income taxes on continuing operations	847	769	817
Income From Continuing Operations Before Equity Investments	2,537	2,158	4,232
Income from equity investments	85	114	56
Income From Continuing Operations (Including Noncontrolling Interests)	2,622	2,272	4,288
Income from discontinued operations, net of tax	4	109	117
Net Income (Including Noncontrolling Interests)	2,626	2,381	4,405
Less: noncontrolling interests from continuing operations	(125)	(89)	(15)
Less: noncontrolling interests from discontinued operations	—	(7)	(9)
Net Income – Linde plc	$ 2,501	$ 2,285	$ 4,381
Net Income – Linde plc			
Income from continuing operations	$ 2,497	$ 2,183	$ 4,273
Income from discontinued operations	$ 4	$ 102	$ 108
Per Share Data – Linde plc Shareholders			
Basic earnings per share from continuing operations	$ 4.74	$ 4.03	$ 12.93
Basic earnings per share from discontinued operations	0.01	0.19	0.33
Basic earnings per share	$ 4.75	$ 4.22	$ 13.26
Diluted earnings per share from continuing operations	$ 4.70	$ 4.00	$ 12.79
Diluted earnings per share from discontinued operations	0.01	0.19	0.32
Diluted earnings per share	$ 4.71	$ 4.19	$ 13.11
Weighted Average Shares Outstanding (000's):			
Basic shares outstanding	526,736	541,094	330,401
Diluted shares outstanding	531,157	545,170	334,127

The accompanying Notes are an integral part of these financial statements.

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME
LINDE PLC AND SUBSIDIARIES
(Dollar amounts in millions)

Year Ended December 31,	2020	2019	2018
NET INCOME (INCLUDING NONCONTROLLING INTERESTS)	$ 2,626	$ 2,381	$ 4,405
OTHER COMPREHENSIVE INCOME (LOSS)			
Translation adjustments:			
Foreign currency translation adjustments	565	118	(401)
Reclassifications to net income	—	12	318
Income taxes	30	3	7
Translation adjustments	595	133	(76)
Funded status - retirement obligations (Note 16):			
Retirement program remeasurements	(675)	(852)	(260)
Reclassifications to net income	92	154	94
Income taxes	114	154	(55)
Funded status - retirement obligations	(469)	(544)	(221)
Derivative instruments (Note 12):			
Current year unrealized gain (loss)	(3)	(32)	—
Reclassifications to net income	42	—	(1)
Income taxes	(8)	7	—
Derivative instruments	31	(25)	(1)
Securities:			
Current year unrealized gain (loss)	—	1	(1)
Reclassifications to net income	—	—	—
Income taxes	—	—	—
Securities	—	1	(1)
TOTAL OTHER COMPREHENSIVE INCOME (LOSS)	157	(435)	(299)
COMPREHENSIVE INCOME (INCLUDING NONCONTROLLING INTERESTS)	2,783	1,946	4,106
Less: noncontrolling interests	(158)	(19)	(83)
COMPREHENSIVE INCOME - LINDE PLC	$ 2,625	$ 1,927	$ 4,023

The accompanying Notes are an integral part of these financial statements.

CONSOLIDATED BALANCE SHEETS
LINDE PLC AND SUBSIDIARIES
(Dollar amounts in millions)

December 31,	2020	2019
Assets		
Cash and cash equivalents	$ 3,754	$ 2,700
Accounts receivable – net	4,167	4,322
Contract assets	162	368
Inventories	1,729	1,697
Prepaid and other current assets	1,112	1,265
Total Current Assets	10,924	10,352
Property, plant and equipment – net	28,711	29,064
Equity investments	2,061	2,027
Goodwill	28,201	27,019
Other intangible assets – net	16,184	16,137
Other long-term assets	2,148	2,013
Total Assets	$ 88,229	$ 86,612
Liabilities and Equity		
Accounts payable	$ 3,095	$ 3,266
Short-term debt	3,251	1,732
Current portion of long-term debt	751	1,531
Contract liabilities	1,769	1,758
Accrued taxes	542	370
Other current liabilities	4,332	3,503
Total Current Liabilities	13,740	12,160
Long-term debt	12,152	10,693
Other long-term liabilities	5,519	4,888
Deferred credits	7,236	7,236
Total Liabilities	38,647	34,977
Commitments and contingencies (Note 17)		
Redeemable noncontrolling interests	13	113
Linde plc Shareholders' Equity:		
Ordinary shares (€0.001 par value, authorized 1,750,000,000 shares, 2020 issued: 552,012,862 ordinary shares; 2019 issued: 552,012,862 ordinary shares)	1	1
Additional paid-in capital	40,202	40,201
Retained earnings	17,178	16,842
Accumulated other comprehensive income (loss)	(4,690)	(4,814)
Less: Treasury stock, at cost (2020 – 28,718,333 shares and 2019 – 17,632,318 shares)	(5,374)	(3,156)
Total Linde plc Shareholders' Equity	47,317	49,074
Noncontrolling interests	2,252	2,448
Total Equity	49,569	51,522
Total Liabilities and Equity	$ 88,229	$ 86,612

The accompanying Notes are an integral part of these financial statements.

CONSOLIDATED STATEMENTS OF CASH FLOWS
LINDE PLC AND SUBSIDIARIES
(Millions of dollars)

Year Ended December 31,	2020	2019	2018
Increase (Decrease) in Cash and Cash Equivalents			
Operations			
Net income – Linde plc	$ 2,501	$ 2,285	$ 4,381
Less: income from discontinued operations, net of tax and noncontrolling interests	(4)	(102)	(108)
Add: Noncontrolling interests from continuing operations	125	89	15
Income from continuing operations (including noncontrolling interests)	$ 2,622	$ 2,272	$ 4,288
Adjustments to reconcile net income to net cash provided by operating activities:			
Cost Reduction Programs and other charges, net of payments	258	(236)	40
Amortization of merger-related inventory step-up	—	12	368
Tax Act income tax charge, net	—	—	(61)
Depreciation and amortization	4,626	4,675	1,830
Deferred income taxes, excluding Tax Act	(369)	(303)	(187)
Share-based compensation	133	95	62
Net gain on sale of businesses, net of tax	—	(108)	(2,923)
Non-cash charges and other	152	(127)	175
Working capital			
Accounts receivable	19	80	(124)
Contract assets and liabilities, net	90	87	—
Inventory	18	(81)	(4)
Prepaid and other current assets	128	(72)	43
Payables and accruals	109	(174)	287
Pension contributions	(91)	(94)	(87)
Long-term assets, liabilities and other	(266)	93	(53)
Net cash provided by operating activities	7,429	6,119	3,654
Investing			
Capital expenditures	(3,400)	(3,682)	(1,883)
Acquisitions, net of cash acquired	(68)	(225)	(25)
Divestitures and asset sales, net of cash divested	482	5,096	5,908
Cash acquired in merger transaction	—	—	1,363
Net cash provided by (used for) investing activities	(2,986)	1,189	5,363
Financing			
Short-term debt borrowings (repayments) – net	1,198	224	208
Long-term debt borrowings	2,796	99	8
Long-term debt repayments	(2,681)	(1,583)	(3,124)
Issuances of ordinary shares	47	72	77
Purchases of ordinary shares	(2,457)	(2,658)	(599)
Cash dividends – Linde plc shareholders	(2,028)	(1,891)	(1,166)
Noncontrolling interest transactions and other	(220)	(3,260)	(402)
Net cash used for financing activities	(3,345)	(8,997)	(4,998)
Discontinued Operations			
Cash provided by operating activities	$ —	$ 69	$ 48
Cash used for investing activities	—	(60)	(23)
Cash provided by financing activities	—	5	2
Net cash provided by discontinued operations	—	14	27
Effect of exchange rate changes on cash and cash equivalents	(44)	(77)	(60)
Change in cash and cash equivalents	1,054	(1,752)	3,986
Cash and cash equivalents, beginning-of-period	2,700	4,466	617
Cash and cash equivalents, including discontinued operations	$ 3,754	$ 2,714	$ 4,603
Cash and cash equivalents of discontinued operations	—	(14)	(137)
Cash and cash equivalents, end-of-period	$ 3,754	$ 2,700	$ 4,466

Supplemental Data						
Income taxes paid	$	1,066	$	1,357	$	757
Interest paid, net of capitalized interest (Note 7)	$	322	$	275	$	214

The accompanying Notes are an integral part of these financial statements.

CONSOLIDATED STATEMENTS OF EQUITY
LINDE PLC AND SUBSIDIARIES
(Dollar amounts in millions, except per share data, shares in thousands)

	Linde plc Shareholders' Equity									
	Ordinary shares					Treasury Stock				
Activity	**Shares**	**Amounts**	**Additional Paid-in Capital**	**Retained Earnings**	**Accumulated Other Comprehensive Income (Loss) (Note 7)**	**Shares**	**Amounts**	**Linde plc Shareholders' Equity**	**Noncontrolling Interests**	**Total Equity**
Balance, December 31, 2017	383,231	$ 4	$ 4,084	$ 13,224	$ (4,098)	96,454	$ (7,196)	$ 6,018	$ 493	$ 6,511
Net Income available for Linde plc shareholders				4,381				4,381	21	4,402
Other comprehensive income (loss)					(265)			(265)	59	(206)
Noncontrolling interests:										
Dividends and other capital reductions								—	(49)	(49)
Additions (Reductions) - (Note 14)			(127)					(127)	(186)	(313)
Redemption value adjustments (Note 14)				(3)				(3)		(3)
Dividends ($3.30 per ordinary share)				(1,166)				(1,166)		(1,166)
Issuances of common stock:										
For the dividend reinvestment and stock purchase plan						(31)	5	5		5
For employee savings and incentive plans	255		(46)			(1,109)	79	33		33
Purchases of common stock						4,079	(630)	(630)		(630)
Share-based compensation			62					62		62
Impact of Tax Reform				93	(93)			—		—
Impact of Merger	167,824	(3)	36,178			(95,324)	7,113	43,288	5,146	48,434
Balance, December 31, 2018	551,310	$ 1	$40,151	$ 16,529	$ (4,456)	4,069	$ (629)	$ 51,596	$ 5,484	$ 57,080
Net Income available for Linde plc shareholders				2,285				2,285	94	2,379
Other comprehensive income (loss)					(358)			(358)	(77)	(435)
Noncontrolling interests:										
Dividends and other capital reductions								—	(132)	(132)
Additions (Reductions) - (Note 14)								—	(2,921)	(2,921)
Redemption value adjustments (Note 14)				(8)				(8)		(8)
Dividends ($3.50 per ordinary share)				(1,891)				(1,891)		(1,891)

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	Linde plc Shareholders' Equity									
	Ordinary shares					Treasury Stock				
Activity	**Shares**	**Amounts**	**Additional Paid-in Capital**	**Retained Earnings**	**Accumulated Other Comprehensive Income (Loss) (Note 7)**	**Shares**	**Amounts**	**Linde plc Shareholders' Equity**	**Noncontrolling Interests**	**Total Equity**
Issuances of common stock:										
For the dividend reinvestment and stock purchase plan								—		—
For employee savings and incentive plans	703		(45)	(73)		(770)	127	9		9
Purchases of common stock						14,333	(2,654)	(2,654)		(2,654)
Share-based compensation			95					95		95
Balance, December 31, 2019	552,013	1	40,201	16,842	(4,814)	17,632	(3,156)	49,074	2,448	51,522
Net Income available for Linde plc shareholders				2,501				2,501	125	2,626
Other comprehensive income (loss)					124			124	33	157
Noncontrolling interests:										
Dividends and other capital reductions								—	(161)	(161)
Additions (Reductions) - (Note 14)								—	(193)	(193)
Redemption value adjustments				17				17		17
Dividends ($3.852 per ordinary share)				(2,028)				(2,028)		(2,028)
Issuances of ordinary shares:										
For employee savings and incentive plans			(132)	(154)		(1,208)	233	(53)		(53)
Purchases of ordinary shares						12,294	(2,451)	(2,451)		(2,451)
Share-based compensation			133					133		133
Balance, December 31, 2020	552,013	$ 1	$40,202	$ 17,178	$ (4,690)	28,718	$ (5,374)	$ 47,317	$ 2,252	$ 49,569

The accompanying Notes are an integral part of these financial statements

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
LINDE PLC AND SUBSIDIARIES

NOTE 1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Linde plc ("Linde" or "the company") is an incorporated public limited company formed under the laws of Ireland. Linde's registered office is located at Ten Earlsfort Terrace, Dublin 2, D02 T380 Ireland. Linde's principal executive offices are located at The Priestley Centre, 10 Priestley Road, Surrey Research Park, Guildford, Surrey GU2 7XY, United Kingdom. Linde trades on the New York Stock Exchange and on the Frankfurt Stock Exchange under the symbol LIN.

Principles of Consolidation – The consolidated financial statements were prepared in conformity with accounting principles generally accepted in the United States of America (" U.S. GAAP") and include the accounts of all significant subsidiaries where control exists and, in limited situations, variable-interest entities where the company is the primary beneficiary. Intercompany transactions and balances are eliminated in consolidation and any significant related-party transactions have been disclosed.

Equity investments generally consist of 20% to 50% owned operations where the company exercises significant influence, but does not have control. Equity income from equity investments in corporations is reported on an after-tax basis. Pre-tax income from equity investments that are partnerships or limited-liability corporations is included in other income (expenses) – net with related taxes included in Income taxes. Equity investments are reviewed for impairment whenever events or circumstances reflect that an impairment loss may have been incurred.

Changes in ownership interest that result either in consolidation or deconsolidation of an investment are recorded at fair value through earnings, including the retained ownership interest, while changes that do not result in either consolidation or deconsolidation of a subsidiary are treated as equity transactions.

Use of Estimates – The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. While actual results could differ, management believes such estimates to be reasonable.

Operations – Linde is the largest industrial gases company globally. The company produces, sells and distributes atmospheric, process and specialty gases to a diverse group of industries including aerospace, chemicals, food and beverage, electronics, energy, healthcare, manufacturing, and metals. Linde's Engineering business offers its customers an extensive range of gas production and processing services including supplying plant components and services directly to customers.

Revenue Recognition – Revenue is recognized as control of goods or services are transferred to customers in an amount that reflects the consideration to which an entity expects to be entitled to receive in exchange for the goods or services. See Note 19 for additional details regarding Linde's revenue recognition policies.

Cash Equivalents – Cash equivalents are considered to be highly liquid securities with original maturities of three months or less.

Inventories – Inventories are stated at the lower of cost or net realizable value. Cost is determined using the average-cost method.

Property, Plant and Equipment – Net – Property, plant and equipment are carried at cost, net of accumulated depreciation. The company capitalizes labor, applicable overhead and interest as part of the cost of constructing major facilities. Expenditures for additions and improvements that extend the lives or increase the capacity of plant assets are also capitalized. Depreciation is calculated on the straight-line method based on the estimated useful lives of the assets, which range from 3 years to 40 years (see Note 8). Linde uses accelerated depreciation methods for tax purposes where appropriate. Maintenance of property, plant and equipment is generally expensed as incurred.

The company performs a test for impairment whenever events or changes in circumstances indicate that the carrying amount of an individual asset or asset group may not be recoverable. Should projected undiscounted future cash flows be less than the carrying amount of the asset or asset group, an impairment charge reducing the carrying amount to fair value is required. Fair value is determined based on the most appropriate valuation technique, including discounted cash flows.

Asset-Retirement Obligations – An asset-retirement obligation is recognized in the period in which sufficient information exists to determine the fair value of the liability with a corresponding increase to the carrying amount of the related property, plant and equipment which is then depreciated over its useful life. The liability is initially measured at fair value and then accretion expense is recorded in each subsequent period. The company's asset-retirement obligations are primarily associated with its on-site long-term supply arrangements where the company has built a facility on land leased from the customer and is obligated to remove the facility at the end of the contract term. The company's asset-retirement obligations are not material to its consolidated financial statements.

Foreign Currency Translation – For most foreign operations, the local currency is the functional currency and translation gains and losses are reported as part of the accumulated other comprehensive income (loss) component of equity as a cumulative translation adjustment (see Note 7).

Financial Instruments – Linde enters into various derivative financial instruments to manage its exposure to fluctuating interest rates, currency exchange rates, commodity pricing and energy costs. Such instruments primarily include interest-rate swap and treasury rate lock agreements; currency-swap agreements; forward contracts; currency options; and commodity-swap agreements. These instruments are not entered into for trading purposes. Linde only uses commonly traded and non-leveraged instruments.

There are three types of derivatives the company enters into: (i) those relating to fair-value exposures, (ii) those relating to cash-flow exposures, and (iii) those relating to foreign currency net investment exposures. Fair-value exposures relate to recognized assets or liabilities, and firm commitments; cash-flow exposures relate to the variability of future cash flows associated with recognized assets or liabilities, or forecasted transactions; and net investment exposures relate to the impact of foreign currency exchange rate changes on the carrying value of net assets denominated in foreign currencies.

When a derivative is executed and hedge accounting is appropriate, it is designated as either a fair-value hedge, cash-flow hedge, or a net investment hedge. Currently, Linde designates all interest-rate and treasury rate locks as hedges for accounting purposes; however, currency contracts are generally not designated as hedges for accounting purposes unless they are related to forecasted transactions. Whether designated as hedges for accounting purposes or not, all derivatives are linked to an appropriate underlying exposure. On an ongoing basis, the company assesses the hedge effectiveness of all derivatives designated as hedges for accounting purposes to determine if they continue to be highly effective in offsetting changes in fair values or cash flows of the underlying hedged items. If it is determined that the hedge is not highly effective, then hedge accounting will be discontinued prospectively.

Changes in the fair value of derivatives designated as fair-value hedges are recognized in earnings as an offset to the change in the fair values of the underlying exposures being hedged. The changes in fair value of derivatives that are designated as cash-flow hedges are deferred in accumulated other comprehensive income (loss) and are reclassified to earnings as the underlying hedged transaction affects earnings. Provided the hedge remains highly effective, any ineffectiveness is deferred in accumulated other comprehensive income (loss) and are reclassified to earnings as the underlying hedged transaction affects earnings. Hedges of net investments in foreign subsidiaries are recognized in the cumulative translation adjustment component of accumulated other comprehensive income (loss) on the consolidated balance sheets to offset translation gains and losses associated with the hedged net investment. Derivatives that are entered into for risk-management purposes and are not designated as hedges (primarily related to anticipated net income and currency derivatives other than for firm commitments) are recorded at their fair market values and recognized in current earnings.

See Note 12 for additional information relating to financial instruments.

Goodwill – Acquisitions are accounted for using the acquisition method which requires allocation of the purchase price to assets acquired and liabilities assumed based on estimated fair values. Any excess of the purchase price over the fair value of the assets and liabilities acquired is recorded as goodwill. Allocations of the purchase price are based on preliminary estimates and assumptions at the date of acquisition and are subject to revision based on final information received, including appraisals and other analyses which support underlying estimates.

The company performs a goodwill impairment test annually or more frequently if events or circumstances indicate that an impairment loss may have been incurred. During the fourth quarter of fiscal year 2019, the company changed the date of its annual goodwill impairment test from April 30 to October 1. The change was made to more closely align the impairment testing date with the company’s planning process.

The impairment test allows an entity to first assess qualitative factors to determine if it is more likely than not that the fair value of a reporting unit is less than carrying value. If it is determined that it is more likely than not that the fair value of a reporting unit is less than carrying value then the company will estimate and compare the fair value of its reporting units to their carrying value, including goodwill. Reporting units are determined based on one level below the operating segment level. The qualitative analysis of goodwill for the year ending December 31, 2020 showed the fair value of the reporting units substantially exceeded the carrying value, as such further analysis was not performed.

See Note 9 for additional information relating to goodwill.

Other Intangible Assets – Other intangible assets, primarily customer relationships, are amortized over the estimated period of benefit. The determination of the estimated period of benefit will be dependent upon the use and underlying characteristics of the intangible asset. Linde evaluates the recoverability of its intangible assets subject to amortization when facts and circumstances indicate that the carrying value of the asset may not be recoverable. If the carrying value is not recoverable, impairment is measured as the amount by which the carrying value exceeds its estimated fair value. Fair value is generally estimated based on either appraised value or other valuation techniques. Indefinite lived intangible assets related to the Linde brand are evaluated for impairment on an annual basis or more frequently if events or circumstances indicate an impairment loss may have occurred. During the fourth quarter of fiscal year 2019, the company changed the date of its annual impairment test from April 30 to October 1. The change was made to more closely align the impairment testing date with the company's planning process.

See Note 10 for additional information relating to other intangible assets.

Assets Held for Sale and Discontinued Operations – Assets held for sale, as well as liabilities directly related to these assets, are classified separately in the consolidated balance sheets as held for sale if the requirements of the FASB's Accounting Standards Codification ("ASC") 360, *Property, Plant and Equipment*, are satisfied. The main requirements of ASC 360 are: (i) management having the authority to approve the action has committed to a plan to sell the assets and an active program to locate a buyer has been initiated, (ii) the assets are available for sale in their present condition at a reasonable market price, and (iii) a sale within the next twelve months is probable. Assets classified as held for sale are measured at the lower of carrying amount and fair value less costs to sell. Amortization and depreciation has been discontinued. The process involved in determining the fair value less costs to sell involves estimates and assumptions that are subject to uncertainty.

Discontinued operations are reported as soon as a business is classified as held for sale, or has already been disposed of, and when the business to be disposed of represents a strategic shift that has (or will have) a major effect on the company's operations and financial results. Businesses acquired with the intent of divesting are also required to be reported as discontinued operations. The profit/loss from discontinued operations is reported separately from the expenses and income from continuing operations in the consolidated statements of income. In the consolidated statement of cash flows, the cash flows from discontinued operations are shown separately from the cash flows from continuing operations. The information provided in the Notes relates to continuing operations. If the information relates exclusively to discontinued operations, this is highlighted accordingly.

Income Taxes – Deferred income taxes are recorded for the temporary differences between the financial statement and tax bases of assets and liabilities using currently enacted tax rates. Valuation allowances are established against deferred tax assets whenever circumstances indicate that it is more likely than not that such assets will not be realized in future periods.

Under the guidance for accounting for uncertainty in income taxes, the company can recognize the benefit of an income tax position only if it is more likely than not (greater than 50%) that the tax position will be sustained upon tax examination, based solely on the technical merits of the tax position. Otherwise, no benefit can be recognized. The tax benefits recognized are measured based on the largest benefit that has a greater than 50% likelihood of being realized upon ultimate settlement. Additionally, the company accrues interest and related penalties, if applicable, on all tax exposures for which reserves have been established consistent with jurisdictional tax laws. Interest and penalties are classified as income tax expense in the financial statements.

See Note 5 for additional information relating to income taxes.

Retirement Benefits – Most Linde employees participate in a form of defined benefit or contribution retirement plan, and additionally certain employees are eligible to participate in various post-employment health care and life insurance benefit plans. The cost of contribution plans is recognized in the year earned while the cost of other plans is recognized over the employees' expected service period to the company, all in accordance with the applicable accounting standards. The funded status of the plans is recorded as an asset or liability in the consolidated balance sheets. Funding of retirement benefits varies and is in accordance with local laws and practices.

See Note 16 for additional information relating to retirement programs.

Share-based Compensation– The company has historically granted share-based awards which consist of stock options, restricted stock and performance-based stock. Share-based compensation expense is generally recognized on a straight-line basis over the stated vesting period. For stock awards granted to full-retirement-eligible employees, compensation expense is recognized over the period from the grant date to the date retirement eligibility is achieved.

For performance-based awards, compensation expense is recognized only if it is probable that the performance condition will be achieved.

See Note 15 for additional disclosures relating to share-based compensation.

Reclassifications – Certain prior years' amounts have been reclassified to conform to the current year's presentation.

Recently Issued Accounting Standards

Accounting Standards Implemented in 2020

- **Credit Losses on Financial Instruments** –In June 2016, the FASB issued updated guidance on the measurement of credit losses. The guidance introduces a new accounting model for expected credit losses on financial instruments, including trade receivables, based on estimates of current expected credit losses. This guidance is effective for the company beginning in the first quarter 2020 and requires companies to apply the change in accounting on a modified retrospective basis. The adoption of the guidance had an immaterial impact on the consolidated financial statements.

- **Simplifying the Test for Goodwill Impairment** – In January 2017, the FASB issued updated guidance on the measurement of goodwill. The new guidance eliminates the requirement to calculate the implied fair value of goodwill to measure a goodwill impairment charge. The guidance is effective for the company beginning in the first quarter 2020. The adoption of the guidance had no impact on the consolidated financial statements.
- **Fair Value Measurement Disclosures** - In August 2018, the FASB issued guidance that modifies the disclosure requirements for fair value measurements. The guidance is effective in fiscal year 2020, with early adoption permitted. Certain amendments must be applied prospectively while other amendments must be applied retrospectively. The adoption of the guidance had an immaterial impact on the consolidated financial statements.
- **Retirement Benefit Disclosures** - In August 2018, the FASB issued guidance that modifies the disclosure requirements for employers that sponsor defined benefit pension or other postretirement benefit plans. The guidance is effective in fiscal year 2020, with early adoption permitted, and must be applied on a retrospective basis. The adoption of the guidance had an immaterial impact on the consolidated financial statements impacting disclosure only.

Accounting Standards to be Implemented

- **Income Taxes - Simplifying the Accounting for Income Taxes** - In December 2019, the FASB issued guidance which simplifies the accounting for income taxes by removing several exceptions in the current standard and adds guidance to reduce complexity in certain areas, such as requiring that an entity reflect the effect of an enacted change in tax laws or rates in the annual effective tax rate computation in the interim period that includes the enactment date, evaluating whether a step-up in tax basis of goodwill relates to a business combination or a separate transaction and allocating taxes to members of a consolidated group. The new standard is effective for fiscal years, and interim periods within those fiscal years, beginning after December 15, 2020, with early adoption permitted. The company is currently assessing the impact that adopting this guidance will have on its consolidated financial statements and does not expect this guidance to have a material impact.
- **Reference Rate Reform** - In March 2020, the FASB issued guidance related to reference rate reform which provides practical expedients and exceptions for applying GAAP to contract modifications, hedging relationships and other transactions that the reference London Interbank Offered Rate ("LIBOR") and other interbank offered rates. This update is applicable to our contracts and hedging relationships that reference LIBOR and other interbank offered rates. The amendments may be applied to impacted contracts and hedges prospectively through December 31, 2022. We are currently evaluating the impact of this guidance on our consolidated financial statements.

NOTE 2. Business Combination and Divestitures

Merger of Praxair, Inc. and Linde AG

On October 31, 2018 Praxair and Linde AG combined their respective businesses through an all-stock transaction and became subsidiaries of the company.

In connection with the business combination, each share of common stock of Praxair par value $0.01 per share, (excluding any shares held in treasury immediately prior to the effective time of the merger, which were automatically canceled and retired for no consideration) was converted into one ordinary share, par value €0.001 per share, of Linde plc. Additionally, each tendered share of common stock of Linde AG was converted into 1.54 ordinary shares of Linde plc.

As provided in the business combination agreement, at the effective time of the business combination outstanding Praxair stock options and other equity awards were generally converted into stock options and equity awards on a 1:1 basis with respect to Linde shares. Outstanding Linde AG share-based compensation awards were either settled in cash (for the portion vested), or were converted into similar stock options and equity awards with respect to Linde shares (for the portion unvested), after giving effect to the 1.54 exchange ratio.

Results of Linde AG Operations in 2018

The results of operations of Linde AG have been included in the company's consolidated statements of income since the merger. The following table provides Linde AG "Sales" and "Income (loss) from continuing operations" included in the company's results for the period November 1 through December 31, 2018.

Millions of dollars

Linde AG Results of Operations	**November 1, - December 31, 2018**
Sales	$ 2,873
Income (loss) from continuing operations*	$ (385)

*Includes net charges of $451 million related to the impacts of purchase accounting.

Unaudited Pro Forma Information - 2018

Linde's unaudited pro forma results presented below were prepared pursuant to the requirements of ASC 805 and give effect to the merger as if it had been consummated on January 1, 2017. The pro forma results have been prepared for comparative purposes only, and do not necessarily represent what the revenue or results of operations would have been had the merger been completed on January 1, 2017. In addition, these results are not intended to be a projection of future operating results and do not reflect synergies that might be achieved.

The unaudited pro forma results include adjustments for the preliminary purchase accounting impact (including, but not limited to, depreciation and amortization associated with the acquired tangible and intangible assets, amortization of the fair value adjustment to investment in nonconsolidated affiliates, and reduction of interest expense related to the fair value adjustment to long-term debt along with the related tax and non-controlling interest impacts), the alignment of accounting policies, adjustments due to IFRS compliant reporting conversion to U.S. GAAP and the elimination of transactions between Praxair and Linde AG.

The unaudited pro forma results exclude the results of operations of the Linde AG merger-related divestitures as these divestitures are reflected as discontinued operations. The Praxair merger-related divestitures are included in the results from continuing operations, including the results from Praxair's European business through the disposition date of December 3, 2018, in the unaudited pro forma results presented below, for all periods presented, as these divestitures do not qualify for discontinued operations.

The unaudited pro forma results are summarized below:

Millions of dollars	**2018**
Sales (a)	$ 29,774
Income from continuing operations	$ 4,739

(a) Includes sales from Praxair's merger-related divestitures of $1,625 million for the year ended December 31, 2018.

Significant nonrecurring amounts reflected in the pro forma results are as follows:

A $3,294 million gain ($2,923 million after tax) was recorded in the fourth quarter 2018 as a result of the divestiture of Praxair's European industrial gases business and is included in the December 31, 2018 pro forma income from continuing operations.

From January 1, 2017 through December 31, 2018, Praxair, Inc. and Linde AG collectively incurred pre-tax costs of $736 million ($680 million after tax) to prepare for and close the merger. These merger costs were reflected within the results of operations in the pro forma results as if they were incurred on January 1, 2017. Any costs incurred related to merger-related divestitures and integration and to prepare for the intended business separations were reflected in the pro forma results in the period in which they were incurred.

The company incurred pre-tax charges of $368 million ($279 million after tax) and $10 million ($8 million after tax) in 2018 related to the fair value step-up of inventories acquired and sold as well as a pension settlement due to the payout to certain participants as a result of change in control provisions within a U.S. nonqualified pension plan, respectively. The 2018 pro forma results were adjusted to exclude these charges.

Merger-Related Divestitures

Praxair Merger-Related Divestitures - Primarily European Industrial Gases Business

As a condition of the EC regulatory approval of the merger transaction, Praxair agreed to sell the majority of its industrial gases business in Europe. The below transactions were completed in 2018, and the company recognized a net pre-tax gain of $3,294 million ($2,923 million after tax) in the consolidated statements of income.

- The Società Italiana Acetilene e Derivati S.p.A. ("SIAD") Sale and Purchase Agreement dated December 5, 2017 whereby Praxair agreed, *inter alia*, to sell its 34% non-controlling participation in its Italian joint venture SIAD to its joint venture partner Flow Fin in exchange for Flow Fin’s 40% non-controlling participation in Praxair’s majority-owned Italian joint venture, Rivoira S.p.A., and cash payment of a net purchase price of €90 million ($102 million as of October 31, 2018) by Praxair to Flow Fin. This transaction was completed on October 31, 2018, and;

- The Praxair Europe Sale and Purchase Agreement dated July 5, 2018 pursuant to which Praxair sold the majority of its European businesses to Taiyo Nippon Sanso Corporation for €5,000 million in cash consideration ($5,700 million at December 3, 2018), reduced by estimated normal closing adjustments of €86 million ($96 million). These transactions were completed on December 3, 2018.

Additionally, to satisfy regulatory requirements in other jurisdictions, Praxair agreed to sell certain operations in Chile, China, India and South Korea. The Chilean business was sold as part of the Linde AG Americas SPA (as defined below). The sale of the select Indian assets was completed on July 12, 2019 with a sale price of $218 million and resulted in a gain of $164 million recognized in "Net gain on sale of businesses" in the consolidated statements of income. The sale of select assets in South Korea and China were completed in 2019 and 2020, respectively. These businesses were evaluated for discontinued operations accounting treatment under U.S. GAAP and it was determined that they did not meet the definition of a discontinued operation as these transactions did not represent a strategic shift with a major effect, after considering the impact of the merger.

Linde AG Merger-Related Divestitures - Primarily Americas Industrial Gases Business

As a condition of the U.S. regulatory approval of the merger, Linde AG agreed to sell the majority of its industrial gases business in the Americas, as described below:

- The Linde AG Americas Sales and Purchase Agreement, dated July 16, 2018, as and further amended on September 22, 2018, October 19, 2018, and February 20, 2019 whereby Linde AG and Praxair, Inc. entered into an agreement with a consortium comprising companies of the German industrial gases manufacturer Messer Group and CVC Capital Partners Fund VII to sell the majority of Linde AG’s industrial gases business in North America and certain industrial gases business activities of Linde AG's in South America for $2.9 billion in cash consideration after purchase price adjustments for certain items relating to assets and liabilities of the sold

businesses. In addition, divestitures include $0.5 billion of proceeds for incremental plant sales within the Americas under other agreements. These transactions were completed on March 1, 2019.

- On April 30, 2019, Linde completed the sale of select assets of Linde South Korea with the sale price of $1.2 billion to IMM Private Equity Inc., to satisfy requirements of the Korea Fair Trade Commission. The assets divested include bulk and on-site business in Giheung, Pohang and Seosansites as well as oxygen and nitrogen on-site generators.

- On December 16, 2019, Linde completed the sale of select assets of Linde India with a sale price of $193 million.
- In March 2020, Linde completed the sale of select assets of Linde China with a sale price of $98 million.

Discontinued Operations

Only the sales of the Linde AG merger-related divestitures meet the criteria for discontinued operations, Praxair merger-related divestitures do not qualify as discontinued operations. As such, operations related to the Linde AG merger-related divestitures are included within Income from discontinued operations, net of tax for periods subsequent to the merger, as summarized below:

Millions of dollars	2020	2019	November 1, - December 31, 2018
Net sales	$ 7	$ 449	$ 388
Cost of sales	3	251	173
Other operating costs	1	43	90
Operating profit	$ 3	$ 155	$ 125
Income from equity investments	1	8	1
Income taxes	—	54	9
Income from discontinued operations, net of tax	$ 4	$ 109	$ 117
Noncontrolling interests	—	(7)	(9)
Income from continuing operations, net of tax and noncontrolling interests	$ 4	$ 102	$ 108

For the years ended December 31, 2020, 2019 and 2018 there were no material amounts of capital expenditures or significant operating or investing non-cash items related to discontinued operations.

Non-Merger Related Acquisitions

Non-merger related acquisitions of $68 million, $225 million and $25 million for the years ended December 31, 2020, 2019 and 2018, respectively, were primarily related to the Americas and are not material, individually or in the aggregate.

NOTE 3. COST REDUCTION PROGRAMS AND OTHER CHARGES

Cost reduction programs and other charges were $506 million, $567 million, and $309 million for the 12 months ended December 31, 2020, 2019, and 2018, respectively. After tax and noncontrolling interests, charges were $372 million, $444 million, and $306 million for the same respective periods.

The following tables provide a summary of the pre-tax charges by reportable segment for the years ended December 31, 2020 and December 31, 2019.

	Year Ended December 31, 2020				
(millions of dollars)	Severance costs	Other cost reduction charges	**Total cost reduction program related charges**	Merger related and other charges	**Total**
Americas	$ 35	$ 24	59	13	$ 72
EMEA	131	21	152	3	155
APAC	7	2	9	3	12
Engineering	38	28	66	4	70
Other	87	18	105	92	197
Total	$ 298	$ 93	$ 391	$ 115	$ 506

	Year Ended December 31, 2019				
(millions of dollars)	Severance costs	Other cost reduction charges	**Total cost reduction program related charges**	Merger related and other charges	**Total**
Americas	$ 36	$ 20	56	34	$ 90
EMEA	105	16	121	21	142
APAC	40	10	50	72	122
Engineering	1	12	13	(9)	4
Other	22	42	64	145	209
Total	$ 204	$ 100	$ 304	$ 263	$ 567

Cost Reduction Programs

In 2019, Linde initiated a cost reduction program, which represents charges of achieving synergies and cost efficiencies expected from the merger of Praxair and Linde AG (see Note 2). Total charges related to the cost reduction programs were $391 million ($277 million, after tax and noncontrolling interests) and $304 million ($233 million, after tax) for the years ended December 31, 2020 and December 31, 2019, respectively.

Severance costs

During the year ended December 31, 2020, severance costs of $298 million were recorded for the elimination of approximately 3,100 positions. Severance costs of $204 million for the year ended December 31, 2019 were recorded for the elimination of approximately 2,400 positions. As of December 31, 2020, the majority of the actions have been taken, with the remaining actions anticipated to be completed within the next 12 months.

Other cost reduction charges

Other cost reduction charges were $93 million and $100 million for the years ended December 31, 2020 and December 31, 2019, respectively. These amounts primarily represent charges related to the execution of the company's synergistic actions including location consolidations and business rationalization projects, software and process harmonization, and associated non-recurring costs.

Merger-Related Costs and Other Charges

Merger-related costs and other charges were $115 million ($95 million, after tax), $263 million ($211 million, after tax and noncontrolling interests), and $309 million ($306 million, after tax and noncontrolling interests) for the years ended December 31, 2020, 2019, and 2018, respectively. 2019 includes other charges for an asset impairment related to a joint venture in APAC of approximately $73 million ($42 million, after tax and noncontrolling interests) resulting from an unfavorable arbitration ruling. 2018 includes other charges of $73 million comprised of the following; (i) a $40 million charge ($40 million, after-tax) related to an unfavorable development related to a supplier contract in China, (ii) restructuring charges of $21 million ($18 million, after-tax) and (iii) a $12 million charge ($12 million, after-tax) associated with the transition to hyper-inflationary accounting in Argentina.

Cash Requirements

Total cash requirements of the cost reduction program and other charges during the twelve months ended December 31, 2020 are estimated to be approximately $390 million, of which $221 million was paid through December 31, 2020.

Remaining cash requirements are expected to be paid through 2023. Total cost reduction programs and other charges, net of payments in the consolidated statements of cash flows for the twelve months ended December 31, 2020 and 2019 also reflect the impact of cash payments of liabilities, including merger-related tax liabilities, accrued as of December 31, 2019 and 2018, respectively.

The following table summarizes the activities related to the company's cost reduction programs and other charges during 2019 and 2020:

(millions of dollars)	Severance costs	Other cost reduction charges	**Total cost reduction program related charges**	Merger related and other charges	**Total**
2019 Cost Reduction Programs and Other Charges	$ 204	$ 100	304	$ 263	$ 567
Less: Cash payments	(91)	(57)	(148)	(112)	(260)
Less: Non-cash charges	—	(21)	(21)	(78)	(99)
Foreign currency translation and other	4	(6)	(2)	(6)	(8)
Balance, December 31, 2019	$ 117	$ 16	$ 133	$ 67	$ 200
2020 Cost Reduction Programs and Other Charges	298	93	391	115	506
Less: Cash payments	(156)	(20)	(176)	(45)	(221)
Less: Non-cash charges	—	(68)	(68)	(82)	(150)
Foreign currency translation and other	24	1	25	9	34
Balance, December 31, 2020	$ 283	$ 22	$ 305	$ 64	$ 369

Classification in the consolidated financial statements

The pre-tax charges for each year are shown within operating profit in a separate line item on the consolidated statements of income. In the consolidated balance sheets, reductions in assets are recorded against the carrying value of the related assets and unpaid amounts are recorded as other current or long-term liabilities (see Note 7). On the consolidated statements of cash flows, the pre-tax impact of these charges, net of cash payments, is shown as an adjustment to reconcile net income to net cash provided by operating activities. In Note 18 Segment Information, Linde excluded these charges from its management definition of segment operating profit; a reconciliation of segment operating profit to consolidated operating profit is shown within the segment operating profit table.

NOTE 4. LEASES

In the normal course of its business, Linde enters into various leases as the lessee, primarily involving manufacturing and distribution equipment and office space. Linde determines whether a contract is or contains a lease at contract inception. Total lease and rental expenses related to operating lease right of use assets for the twelve months ended December 31, 2020 and 2019 was $341 million, and $364 million respectively. Operating leases costs are included in selling, general and administrative expenses and cost of sales, exclusive of depreciation and amortization. The related assets and obligations are included in other long term assets and other current liabilities and other long term liabilities, respectively. Total lease and rental expenses related to finance lease right of use assets for the twelve months ended December 31, 2020 and 2019 was $44 million and $31 million, respectively, and the costs are included in depreciation and amortization and interest. Related assets and obligations are included in other long term assets and other current liabilities and other long term liabilities, respectively**.** Linde includes renewal options that are reasonably certain to be exercised as part of the lease term. Operating and financing lease expenses above include short term and variable lease costs which are immaterial.

As most leases do not provide an implicit rate, Linde uses the applicable incremental borrowing rate at lease commencement to measure lease liabilities and right-of-use assets. Linde determines incremental borrowing rates through market sources.

The company has elected to apply the short-term lease exception for all underlying asset classes. Short-term leases are leases that, at the commencement date, have a lease term of twelve months or less and do not include a purchase option that the lessee is reasonably certain to exercise. Leases that meet the short-term lease definition are not recognized on the balance sheet, but rather expensed on a straight-line basis over the lease term.

Some leasing arrangements require variable payments that are dependent on usage, output, or may vary for other reasons, such as insurance. The company does not have material variable lease payments.

Gains and losses on sale and leaseback transactions were immaterial. Operating cash flows used for operating leases for the twelve months ended December 31, 2020 and 2019 were $317 million and $341 million, respectively. Cash flows used for finance leases for the same period were immaterial.

Supplemental balance sheet information related to leases is as follows:

(Millions of dollars)	**December 31, 2020**	**December 31, 2019**
Operating Leases		
Operating lease right-of-use assets	$ 935	$ 1,025
Other current liabilities	237	260
Other long-term liabilities	669	716
Total operating lease liabilities	906	976
Finance Leases		
Finance lease right-of-use assets*	155	140
Other current liabilities*	38	32
Other long-term liabilities*	125	117
Total finance lease liabilities	$ 163	$ 149

* Finance right of use assets at December 31, 2019 are recorded within property plant and equipment. Current and long-term finance lease liabilities at December 31, 2019 are recorded within current portion long-term debt and long-term debt, respectively.

Supplemental operating lease information:

	December 31, 2020	**December 31, 2019**
Weighted average lease term (years)	9	7
Weighted average discount rate	2.83 %	2.97 %

Future operating and finance lease payments as of December 31, 2020 are as follows (millions of dollars):

Period	Operating Leases	Financing Leases
2021	$ 251	$ 41
2022	187	37
2023	131	27
2024	89	17
2025	62	12
Thereafter	257	71
Total future undiscounted lease payments	977	205
Less imputed interest	(71)	(42)
Total reported lease liability	$ 906	$ 163

NOTE 5. INCOME TAXES

The years ended December 31, 2020 and 2019 reflect a full year of Linde plc; the year ended December 31, 2018 reflects Praxair for the entire year and Linde AG for the period beginning October 31, 2018 (the merger date).

Pre-tax income applicable to U.S. and foreign operations is as follows:

(Millions of dollars) Year Ended December 31,	2020	2019	2018
United States	$ 1,253	$ 1,161	$ 931
Foreign (a)	2,131	1,766	4,118
Total income before income taxes	$ 3,384	$ 2,927	$ 5,049

(a) 2019 includes a $164 million gain related to the Praxair India divestiture and 2018 includes a $3,294 million gain related to the Praxair Europe divestiture (See Note 2).

Provision for Income Taxes

The following is an analysis of the provision for income taxes:

(Millions of dollars) Year Ended December 31,	2020	2019 (a)	2018(b)
Current tax expense (benefit)			
U.S. federal	$ 185	$ 64	$ 390
State and local	17	39	(7)
Foreign	1,013	969	620
	1,215	1,072	1,003
Deferred tax expense (benefit)			
U.S. federal	20	85	8
State and local	7	—	15
Foreign	(395)	(388)	(209)
	(368)	(303)	(186)
Total income taxes	$ 847	$ 769	$ 817

(a) 2019 includes $70 million related to divestitures, foreign current tax expense of $48 million and foreign deferred tax expense of $22 million.

(b) 2018 includes a benefit of $61 million related to the Tax Act (See below) and a charge of $371 million ($252 million U.S., $4 million state, $114 million foreign current tax expense and $1 million of U.S. deferred income tax expense) related to divestitures (See Note 2).

U.S. Tax Cuts and Jobs Act (Tax Act) 2018

Following the enactment of the Tax Cuts and Jobs Act (“Tax Act”) in 2017, the company completed its accounting and updated its provisional estimates in accordance with SAB 118 in the fourth quarter of 2018, resulting in a net reduction to tax expense of $61 million, $41 million U.S. federal and $20 million of state income tax (net of federal tax benefit).

As of December 31, 2020 and 2019, the tax payable related to the deemed repatriation tax is $230 million and $261 million, respectively, of which $204 million and $235 million is classified as other long-term liabilities on the consolidated balance sheet (See Note 7), respectively. The company is required to fund the balance in annual installments through 2025.

Effective Tax Rate Reconciliation

For purposes of the effective tax rate reconciliation, the company utilizes the U.S. statutory income tax rate of 21%. An analysis of the difference between the provision for income taxes and the amount computed by applying the U.S. statutory income tax rate to pre-tax income follows:

(Dollar amounts in millions) Year Ended December 31,	2020		2019		2018	
U.S. statutory income tax	$ 711	21.0 %	$ 615	21.0 %	$ 1,060	21.0 %
State and local taxes – net of federal benefit	21	0.6 %	31	1.1 %	30	0.6 %
U.S. tax credits and deductions (a)	(8)	(0.2)%	(31)	(1.1)%	(12)	(0.2)%
Foreign tax differentials (b)	167	4.9 %	113	3.9 %	57	1.1 %
Share-Based compensation	(53)	(1.6)%	(41)	(1.4)%	(22)	(0.4)%
Tax Act	—	— %	—	— %	(61)	(1.2)%
Divestitures (c)	—	— %	36	1.2 %	(321)	(6.4)%
Other – net (d)	9	0.3 %	46	1.6 %	86	1.7 %
Provision for income taxes	$ 847	25.0 %	$ 769	26.3 %	$ 817	16.2 %

(a) U.S. tax credits and deductions relate to foreign derived intangible income and the research and experimentation tax credit in 2020, 2019 and 2018.

(b) Primarily related to differences between the U.S. tax rate and the statutory tax rate in the countries where the company operates. Other permanent items and tax rate changes were not significant.

(c) Divestitures primarily relate to the sale of the company's Indian business in 2019 and European business in 2018 (See Note 2).

(d) Other - net includes $11 million, $26 million and $34 million of U.S tax related to Global Intangible Low-Taxed Income in 2020, 2019 and 2018, respectively and an increase in unrecognized tax benefits in Europe of $44 million in 2018.

Net Deferred Tax Liabilities

Net deferred tax liabilities included in the consolidated balance sheets are comprised of the following:

(Millions of dollars) December 31,	2020	2019
Deferred tax liabilities		
Fixed assets	$ 3,430	$ 3,539
Goodwill	173	145
Other intangible assets	3,703	3,688
Subsidiary/equity investments	609	664
Other (a)	791	789
	$ 8,706	$ 8,825
Deferred tax assets		
Carryforwards	$ 386	$ 441
Benefit plans and related (b)	814	721
Inventory	70	72
Accruals and other (c)	1,243	1,167
	$ 2,513	$ 2,401
Less: Valuation allowances (d)	(243)	(222)
	$ 2,270	$ 2,179
Net deferred tax liabilities	$ 6,436	$ 6,646
Recorded in the consolidated balance sheets as (Note 7):		
Other long-term assets	268	243
Deferred credits	6,704	6,889
	$ 6,436	$ 6,646

(a) Includes $255 million in 2020 and 2019 related to right-of-use lease assets.

(b) Includes deferred taxes of $560 million and $446 million in 2020 and 2019, respectively, related to pension / OPEB funded status (See Notes 7 and 16).

(c) Includes $255 million in 2020 and 2019 related to lease liabilities and $63 million and $81 million in 2020 and 2019, respectively, related to research and development costs.

(d) Summary of valuation allowances relating to deferred tax assets follows (millions of dollars):

	2020	2019	2018
Balance, January 1,	$ (222)	$ (237)	$ (76)
Income tax (charge) benefit	(21)	(31)	(51)
Merger with Linde AG	—	18	(121)
Other, including write-offs (i)	2	26	7
Translation adjustments	(2)	2	4
Balance, December 31,	$ (243)	$ (222)	$ (237)

(i) 2019 includes $26 million related to the squeeze out of Linde AG (See Note 14).

The company evaluates deferred tax assets quarterly to ensure that estimated future taxable income will be sufficient in character (e.g., capital gain versus ordinary income treatment), amount and timing to result in their recovery. After considering the positive and negative evidence, a valuation allowance is established to reduce the assets to their realizable value when management determines that it is more likely than not (i.e., greater than 50% likelihood) that a deferred tax asset will not be realized. Considerable judgment is required in establishing deferred tax valuation allowances.

As of December 31, 2020, the company had $386 million of deferred tax assets relating to net operating losses (“NOLs”) and tax credits and $243 million of valuation allowances. These deferred tax assets include $276 million relating to NOLs of which $34 million expire within 5 years, $110 million expire after 5 years and $132 million have no expiration. The deferred tax assets also include $110 million related to credits of which $9 million expire within 5 years, $93 million expire after 5 years, and $8 million have no expiration. The valuation allowances of $243 million primarily relate to NOLs and are required because management has determined, based on financial projections and available tax strategies, that it is unlikely that the NOLs will be utilized before they expire. If events or circumstances change, valuation allowances are adjusted at that time resulting in an income tax benefit or charge.

The company has $609 million of foreign income taxes accrued related to its investments in subsidiaries and equity investments as of December 31, 2020. A provision has not been made for any additional foreign income tax at December 31, 2020 on approximately $32 billion related to its investments in subsidiaries because the company intends to remain indefinitely reinvested. While the $32 billion could become subject to additional foreign income tax if there is a sale of a subsidiary, or earnings are remitted as dividends, it is not practicable to estimate the unrecognized deferred tax liability.

Uncertain Tax Positions

Unrecognized income tax benefits represent income tax positions taken on income tax returns but not yet recognized in the consolidated financial statements. The company has unrecognized income tax benefits totaling $452 million, $472 million and $319 million as of December 31, 2020, 2019 and 2018, respectively. If recognized, essentially all of the unrecognized tax benefits and related interest and penalties would be recorded as a benefit to income tax expense on the consolidated statements of income.

A reconciliation of the beginning and ending amount of unrecognized tax benefits is as follows:

(Millions of dollars)	2020	2019	2018
Unrecognized income tax benefits, January 1	$ 472	$ 319	$ 54
Additions for tax positions of prior years (a)	35	151	104
Reductions for tax positions of prior years	(34)	(3)	(7)
Additions for current year tax positions (b)	11	33	179
Reductions for settlements with taxing authorities (c)	(39)	(26)	(3)
Foreign currency translation and other	7	(2)	(8)
Unrecognized income tax benefits, December 31	$ 452	$ 472	$ 319

(a) Increase primarily relates to tax positions in the United States and Europe, $66 million in 2019 related to the merger with Linde AG.

(b) 2018 includes $167 million related to the merger with Linde AG.

(c) Settlements are uncertain tax positions that were effectively settled with the taxing authorities, including positions where the company has agreed to amend its tax returns to eliminate the uncertainty.

The company classifies interest income and expense related to income taxes as tax expense in the consolidated statements of income. The company recognized net interest expense of $29 million, $1 million and $32 million for the years ended December 31, 2020, December 31, 2019 and December 31, 2018, respectively. The company had $99 million and $65 million of accrued interest and penalties as of December 31, 2020 and December 31, 2019, respectively which were recorded in other long-term liabilities in the consolidated balance sheets (See Note 7).

As of December 31, 2020, the company remained subject to examination in the following major tax jurisdictions for the tax years as indicated below:

Major tax jurisdictions	Open Years
North and South America	
United States	2017 through 2020
Canada	2013 through 2020
Mexico	2014 through 2020
Brazil	2003 through 2020
Europe and Africa	
France	2014 through 2020
Germany	2015 through 2020
Netherlands	2015 through 2020
Republic of South Africa	2017 through 2020
Spain	2006 through 2020
United Kingdom	2015 through 2020
Asia and Australia	
Australia	2016 through 2020
China	2015 through 2020
India	2006 through 2020
South Korea	2015 through 2020
Taiwan	2015 through 2020

The company is currently under audit in a number of jurisdictions. As a result, it is reasonably possible that some of these matters will conclude or reach the stage where a change in unrecognized income tax benefits may occur within the next twelve months. At the time new information becomes available, the company will record any adjustment to income tax expense as required. Final determinations, if any, are not expected to be material to the consolidated financial statements. The company is also subject to income taxes in many hundreds of state and local taxing jurisdictions that are open to tax examinations.

NOTE 6. EARNINGS PER SHARE – LINDE PLC SHAREHOLDERS

Basic and Diluted earnings per share - Linde plc shareholders is computed by dividing Income from continuing operations, Income from discontinued operations, net of tax, and Net income – Linde plc for the period by the weighted average number of either basic or diluted shares outstanding, as follows:

	2020	2019	2018
Numerator (Millions of dollars)			
Income from continuing operations	$ 2,497	$ 2,183	$ 4,273
Income from discontinued operations, net of tax	4	102	108
Net Income – Linde plc	$ 2,501	$ 2,285	$ 4,381
Denominator (Thousands of shares)			
Weighted average shares outstanding	526,404	540,859	330,088
Shares earned and issuable under compensation plans	332	235	313
Weighted average shares used in basic earnings per share *	526,736	541,094	330,401
Effect of dilutive securities			
Stock options and awards	4,421	4,076	3,726
Weighted average shares used in diluted earnings per share *	531,157	545,170	334,127
Basic earnings per share from continuing operations	$ 4.74	$ 4.03	$ 12.93
Basic earnings per share from discontinued operations	0.01	0.19	0.33
Basic Earnings Per Share	$ 4.75	$ 4.22	$ 13.26
Diluted earnings per share from continuing operations	$ 4.70	$ 4.00	$ 12.79
Diluted earnings per share from discontinued operations	0.01	0.19	0.32
Diluted Earnings Per Share	$ 4.71	$ 4.19	$ 13.11

* As a result of the merger, share amounts for the year ended December 31, 2018 reflect a weighted average effect of Praxair shares outstanding prior to October 31, 2018 and Linde plc shares outstanding on and after October 31, 2018.

There were no antidilutive shares for the years ended December 31, 2020, 2019 or 2018.

NOTE 7. SUPPLEMENTAL INFORMATION

The years ended December 31, 2020 and 2019 reflect the combined business. December 31, 2018 reflects Praxair for the entire year and the Linde AG for the period beginning after October 31, 2018 (the merger date), including the impacts of purchase accounting.

Income Statement

(Millions of dollars) **Year Ended December 31,**	2020	2019	2018
Selling, General and Administrative			
Selling	$ 1,303	$ 1,600	$ 757
General and administrative	1,890	1,857	872
	$ 3,193	$ 3,457	$ 1,629

Year Ended December 31,	2020	2019	2018
Depreciation and Amortization (a)			
Depreciation	$ 3,861	$ 3,940	$ 1,615
Amortization of intangibles (Note 10)	765	735	215
Depreciation and Amortization	$ 4,626	$ 4,675	$ 1,830

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Year Ended December 31,	2020	2019	2018
Other Income (Expenses) – Net			
Currency related net gains (losses)	$ (28)	$ (11)	$ 4
Partnership income	10	8	8
Severance expense	(5)	(7)	(7)
Asset divestiture gains (losses) – net	(78)	10	6
Other – net	40	68	7
	$ (61)	$ 68	$ 18

Year Ended December 31,	2020	2019	2018
Interest Expense – Net			
Interest incurred on debt and other	$ 277	$ 284	$ 297
Interest income	(55)	(112)	(80)
Amortization on acquired debt	(85)	(96)	(21)
Interest capitalized	(38)	(38)	(20)
Bond redemption (b)	16	—	26
	$ 115	$ 38	$ 202

Year Ended December 31,	2020	2019	2018
Income Attributable to Noncontrolling Interests			
Noncontrolling interests' operations (c)	$ 125	$ 87	$ 12
Redeemable noncontrolling interests' operations (Note 14)	—	2	3
Noncontrolling interests from continuing operations	$ 125	$ 89	$ 15
Noncontrolling interests from discontinued operations	—	$ 7	$ 9

Balance Sheet

(Millions of dollars) December 31,	2020	2019
Accounts Receivable		
Trade and Other receivables	$ 4,638	$ 4,628
Less: allowance for expected credit losses	(471)	(306)
	$ 4,167	$ 4,322

Receivables

For trade receivables an expected credit loss approach was adopted as of January 1, 2020. Linde applies loss rates that are lifetime expected credit losses at initial recognition of the receivables. These expected loss rates are based on an analysis of the actual historical default rates for each business, taking regional circumstances into account. If necessary, these historical default rates are adjusted to reflect the impact of current changes in the macroeconomic environment using forward-looking information. The loss rates are also evaluated based on the expectations of the responsible management team regarding the collectability of the receivables. Gross trade receivables aged less than one year were $4,169 million and $4,075 million at December 31, 2020 and December 31, 2019, respectively, and gross receivables aged greater than one year were $358 million and $249 million at December 31, 2020 and December 31, 2019, respectively. Gross other receivables were $111 million and $304 million at December 31, 2020 and December 31, 2019, respectively. Receivables aged greater than one year are generally fully reserved unless specific circumstances warrant exceptions, such as those backed by federal governments.

Provisions for expected credit losses were $182 million, $170 million and $25 million for the twelve months ended December 31, 2020, 2019 and 2018, respectively. The allowance activity in the twelve months ended December 31, 2020 related to write-offs of uncollectible amounts, net of recoveries and currency movements is not material.

December 31,		2020		2019
Inventories				
Raw materials and supplies	$	411	$	396
Work in process		337		331
Finished goods		981		970
	$	1,729	$	1,697

December 31,		2020		2019
Prepaid and Other Current Assets				
Prepaid and other deferred charges (d)	$	516	$	516
VAT recoverable		261		275
Unrealized gains on derivatives (Note 12)		110		85
Assets held for sale (Note 2)		4		125
Other		221		264
	$	1,112	$	1,265

December 31,		2020		2019
Other Long-term Assets				
Pension assets (Note 16)	$	55	$	78
Insurance contracts (e)		61		75
Long-term receivables, net (f)		201		150
Lease assets (Note 4)		1,090		1,025
Deposits		47		56
Investments carried at cost		23		40
Deferred charges		96		90
Deferred income taxes (Note 5)		268		243
Unrealized gains on derivatives (Note 12)		90		82
Other		217		174
	$	2,148	$	2,013

December 31,	2020	2019
Other Current Liabilities		
Accrued expenses	$ 1,226	$ 1,079
Payroll	653	619
VAT payable	336	268
Pension and postretirement (Note 16)	34	27
Interest payable	135	127
Lease liability (Note 4)	275	260
Insurance reserves	38	38
Unrealized losses on derivatives (Note 12)	70	54
Noncontrolling interest redemption and dividend (Note 14)	231	—
Synergy cost accruals (Note 3)	199	140
Other	1,135	891
	$ 4,332	$ 3,503

December 31,	2020	2019
Other Long-term Liabilities		
Pension and postretirement (Note 16)	$ 2,963	$ 2,548
Tax liabilities for uncertain tax positions (Note 5)	355	342
Tax Act liabilities for deemed repatriation (Note 5)	204	235
Lease liability (Note 4)	794	716
Interest and penalties for uncertain tax positions (Note 5)	99	65
Insurance reserves	33	28
Asset retirement obligation	302	293
Unrealized losses on derivatives (Note 12)	11	45
Synergy cost accruals (Note 3)	170	60
Other	588	556
	$ 5,519	$ 4,888

December 31,	2020	2019
Deferred Credits		
Deferred income taxes (Note 5)	$ 6,704	$ 6,889
Other	532	347
	$ 7,236	$ 7,236

December 31,	2020	2019
Accumulated Other Comprehensive Income (Loss)		
Cumulative translation adjustment - net of taxes:		
Americas (g)	$ (3,788)	$ (3,357)
EMEA (g)	1,020	(136)
APAC (g)	616	(140)
Engineering	354	(29)
Other	(1,020)	282
	(2,818)	(3,380)
Derivatives – net of taxes	4	(27)
Pension/OPEB funded status obligation (net of $560 million and $446 million tax benefit in 2020 and 2019) (Note 16)	(1,876)	(1,407)
	$ (4,690)	$ (4,814)

(a) Depreciation and amortization expense in 2020 include $1,267 million and $653 million, respectively, of Linde AG purchase accounting impacts. In 2019, depreciation and amortization expense include $1,298 million and $642 million, respectively, of Linde AG purchase accounting impacts.

(b) In December 2018, Linde repaid $600 million of 4.50% notes due 2019 and €600 million of 1.50% notes due 2020 resulting in a $26 million interest charge. In December 2020, the company repaid $500 million of 4.05% notes and $500 million of 3.00% notes that were due in 2021 resulting in a $16 million interest charge.

(c) Noncontrolling interests from continuing operations includes a $1 million benefit in 2019 and a $35 million charge in 2018 related to the 8% of Linde AG Shares which were not tendered in the Exchange Offer. Linde AG completed the cash merger squeeze-out of all its minority shares on April 8, 2019 (see Note 2).

In addition, 2020, 2019 and 2018 noncontrolling interests from continuing operations includes $57 million, $54 million and $24 million, respectively, of Linde AG purchase accounting impacts.

(d) Includes estimated income tax payments of $115 million in both 2020 and 2019.

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(e) Consists primarily of insurance contracts and other investments to be utilized for non-qualified pension and OPEB obligations.

(f) The balances at December 31, 2020 and 2019 are net of reserves of $34 million and $44 million, respectively. The amounts in both years relate primarily to long-term notes receivable from customers in APAC and EMEA and government receivables in Brazil.

(g) Americas consists of currency translation adjustments primarily in Canada, Mexico, and Brazil. EMEA relates primarily to Germany, the U.K. and Sweden. APAC relates primarily to China, South Korea, India and Australia.

NOTE 8. PROPERTY, PLANT AND EQUIPMENT – NET

Significant classes of property, plant and equipment are as follows:

(Millions of dollars) December 31,	Depreciable Lives (Yrs)	2020	2019
Production plants (primarily 15-year life) (a)	10-20	$ 28,226	$ 25,493
Storage tanks	15-20	4,461	4,295
Transportation equipment and other	3-15	2,978	2,809
Cylinders	10-30	4,491	4,184
Buildings	25-40	3,327	3,162
Land and improvements (b)	0-20	1,259	1,229
Construction in progress		3,257	3,146
		47,999	44,318
Less: accumulated depreciation		(19,288)	(15,254)
		$ 28,711	$ 29,064

(a) - Depreciable lives of production plants related to long-term customer supply contracts are generally consistent with the contract lives.

(b) - Land is not depreciated.

NOTE 9. GOODWILL

Changes in the carrying amount of goodwill for the years ended December 31, 2020 and 2019 were as follows:

(Millions of dollars)	Americas	EMEA	APAC	Engineering	Other	Total
Balance, December 31, 2018	$ 9,174	$ 10,960	$ 5,295	$ 1,075	$ 370	$ 26,874
Acquisitions (Note 2)	135	—	—		—	135
Measurement period adjustments (Note 2)	(255)	(636)	(323)	1,410	(42)	154
Foreign currency translation and other	(12)	(81)	(15)	(15)	(21)	(144)
Balance, December 31, 2019	9,042	10,243	4,957	2,470	307	27,019
Acquisitions (Note 2)	13	—	—	—	—	13
Foreign currency translation and other	35	643	305	212	23	1,218
Disposals	(7)	(42)	—	—	—	(49)
Balance, December 31, 2020	$ 9,083	$ 10,844	$ 5,262	$ 2,682	$ 330	$ 28,201

Linde has performed its goodwill impairment tests annually during the fourth quarter of each year and has determined that the fair value of each of its reporting units was substantially in excess of its carrying value. For the

2020 test, the company applied the FASB's accounting guidance which allows the company to first assess qualitative factors to determine the extent of additional quantitative analysis, if any, that may be required to test goodwill for impairment. Based on the qualitative assessments performed, the company concluded that it was more likely than not that the fair value of each reporting unit substantially exceeded its carrying value and therefore, further quantitative analysis was not required. As a result, no impairment was recorded. There were no indicators of impairment through December 31, 2020.

NOTE 10. OTHER INTANGIBLE ASSETS

The following is a summary of Linde’s other intangible assets at December 31, 2020 and 2019:

(Millions of dollars) For the year ended December 31, 2020	**Customer Relationships**	**Brands/ Tradenames**	**Other Intangible Assets**	**Total**
Cost:				
Balance, December 31, 2019	$ 13,205	$ 2,764	$ 1,612	$ 17,581
Additions	5	—	56	61
Foreign currency translation	632	134	47	813
Disposals	(2)	—	(20)	(22)
Other *	(64)	(3)	2	(65)
Balance, December 31, 2020	13,776	2,895	1,697	18,368
Less: accumulated amortization:				
Balance, December 31, 2019	(885)	(69)	(490)	(1,444)
Amortization expense (Note 7)	(589)	(45)	(131)	(765)
Foreign currency translation	(53)	(3)	1	(55)
Disposals	1	—	20	21
Other *	56	(1)	4	59
Balance, December 31, 2020	(1,470)	(118)	(596)	(2,184)
Net intangible asset balance at December 31, 2020	$ 12,306	$ 2,777	$ 1,101	$ 16,184

(Millions of dollars) For the year ended December 31, 2019	**Customer Relationships**	**Brands/ Tradenames**	**Other Intangible Assets**	**Total**
Cost:				
Balance, December 31, 2018	$ 13,288	$ 2,288	$ 1,366	$ 16,942
Additions	30	6	51	87
Foreign currency translation	(59)	(21)	(11)	(91)
Measurement period adjustments	(8)	492	178	662
Other *	(46)	(1)	28	(19)
Balance, December 31, 2019	13,205	2,764	1,612	17,581
Less: accumulated amortization:				
Balance, December 31, 2018	(317)	(22)	(380)	(719)
Amortization expense (Note 7)	(584)	(47)	(104)	(735)
Foreign currency translation	—	—	2	2
Other *	16	—	(8)	8
Balance, December 31, 2019	(885)	(69)	(490)	(1,444)
Net balance at December 31, 2019	$ 12,320	$ 2,695	$ 1,122	$ 16,137

*Other primarily relates to the write-off of fully amortized assets and reclassifications.

There are no expected residual values related to these intangible assets. Amortization expense for the years ended December 31, 2020, 2019 and 2018 was $765 million, $735 million and $215 million, respectively. The remaining weighted-average amortization period for intangible assets is approximately 26 years.

Total estimated annual amortization expense related to finite-lived intangibles is as follows:

(Millions of dollars)		
2021	$	729
2022		608
2023		581
2024		572
2025		529
Thereafter		11,173
Total amortization related to finite-lived intangible assets		14,192
Indefinite-lived intangible assets at December 31, 2020		1,992
Net intangible assets at December 31, 2020	$	16,184

NOTE 11. DEBT

The following is a summary of Linde's outstanding debt at December 31, 2020 and 2019:

(Millions of dollars)	2020	2019
Short-term		
Commercial paper	$ 2,527	$ 996
Other borrowings (primarily international)	724	736
Total short-term debt	3,251	1,732
Long-term (a)		
(U.S. dollar denominated unless otherwise noted)		
2.25% Notes due 2020 (b)	—	300
1.75% Euro denominated notes due 2020 (b, c)	—	1,137
0.634% Euro denominated notes due 2020	—	56
4.05% Notes due 2021 (d)	—	499
3.875% Euro denominated notes due 2021 (c)	748	711
3.00% Notes due 2021 (d)	—	499
0.250% Euro denominated notes due 2022 (c)	1,226	1,129
2.45% Notes due 2022	599	599
2.20% Notes due 2022	499	499
2.70% Notes due 2023	499	499
2.00% Euro denominated notes due 2023 (c)	832	776
5.875% GBP denominated notes due 2023 (c)	460	456
1.20% Euro denominated notes due 2024	671	615
1.875% Euro denominated notes due 2024 (c)	389	361
2.65% Notes due 2025	398	398
1.625% Euro denominated notes due 2025	607	556
3.20% Notes due 2026	725	725
3.434% Notes due 2026	196	196
1.652% Euro denominated notes due 2027	100	93
0.250% Euro denominated notes due 2027 (e)	914	—
1.00% Euro denominated notes due 2028 (c)	966	872
1.10% Notes due 2030 (f)	696	—
1.90% Euro denominated notes due 2030	127	118
0.550% Euro denominated notes due 2032 (e)	909	—
3.55% Notes due 2042	664	662
2.00% Notes due 2050 (f)	296	—
International borrowings	372	309
Other	10	159
	12,903	12,224
Less: current portion of long-term debt	(751)	(1,531)
Total long-term debt	12,152	10,693
Total debt	$ 16,154	$ 13,956

(a) Amounts are net of unamortized discounts, premiums and/or debt issuance costs as applicable.

(b) In September 2020, the company repaid €1,000 million of 1.75% notes and $300 million of 2.25% notes that became due.

(c) December 31, 2020 and 2019 included a cumulative $79 million and $38 million adjustment to carrying value, respectively, related to hedge accounting of interest rate swaps.

(d) In December 2020, the company repaid $500 million of 4.05% notes and $500 million of 3.00% notes that were due in 2021 resulting in a $16 million interest charge.

(e) In May 2020, Linde issued €750 million of 0.250% notes due 2027 and €750 million of 0.550% notes due 2032.

(f) In August 2020, Linde issued $700 million of 1.100% notes due 2030 and $300 million of 2.000% notes due 2050.

Credit Facilities

On March 26, 2019 the company and certain of its subsidiaries entered into an unsecured revolving credit agreement ("the Credit Agreement") with a syndicate of banking institutions, which became effective on March 29, 2019. The Credit Agreement provides for total commitments of $5.0 billion, which may be increased up to $6.5 billion, subject to receipt of additional commitments and satisfaction of customary conditions. There are no financial maintenance covenants contained within the Credit Agreement. The revolving credit facility expires on March 26, 2024 with the option to request two one-year extensions of the expiration date. In connection with the effectiveness of the Credit Agreement, Praxair and Linde AG terminated their major respective existing revolving credit facilities. No borrowings were outstanding under the Credit Agreement as of December 31, 2020.

On September 3, 2019 Linde and the company's subsidiaries Linde, Inc. and Linde GmbH entered into a series of parent and subsidiary guarantees related to currently outstanding notes as well as the $5 billion Credit Agreement.

Other Debt Information

As of December 31, 2020 and 2019, the weighted-average interest rate of short-term borrowings outstanding was 0.0% and 0.6%, respectively.

Expected maturities of long-term debt are as follows:

(Millions of dollars)		
2021	$	751
2022		2,440
2023		1,853
2024		1,067
2025		1,083
Thereafter		5,709
	$	12,903

As of December 31, 2020, the amount of Linde's assets pledged as collateral was immaterial.

See Note 13 for the fair value information related to debt.

NOTE 12. FINANCIAL INSTRUMENTS

In its normal operations, Linde is exposed to market risks relating to fluctuations in interest rates, foreign currency exchange rates and energy costs. The objective of financial risk management at Linde is to minimize the negative impact of such fluctuations on the company's earnings and cash flows. To manage these risks, among other strategies, Linde routinely enters into various derivative financial instruments ("derivatives") including interest-rate swap and treasury rate lock agreements, currency-swap agreements, forward contracts, currency options, and commodity-swap agreements. These instruments are not entered into for trading purposes and Linde only uses commonly traded and non-leveraged instruments.

There are three types of derivatives that the company enters into: (i) those relating to fair-value exposures, (ii) those relating to cash-flow exposures, and (iii) those relating to foreign currency net investment exposures. Fair-value exposures relate to recognized assets or liabilities, and firm commitments; cash-flow exposures relate to the variability of future cash flows associated with recognized assets or liabilities, or forecasted transactions; and net investment exposures relate to the impact of foreign currency exchange rate changes on the carrying value of net assets denominated in foreign currencies.

When a derivative is executed and hedge accounting is appropriate, it is designated as either a fair-value hedge, cash-flow hedge, or a net investment hedge. Currently, Linde designates all interest-rate and treasury-rate locks as hedges for accounting purposes; however, cross-currency interest rate contracts are generally not designated as hedges for accounting purposes. Certain currency contracts related to forecasted transactions are designated as hedges for accounting purposes. Whether designated as hedges for accounting purposes or not, all derivatives are linked to an appropriate underlying exposure. On an ongoing basis, the company assesses the hedge effectiveness of all derivatives designated as hedges for accounting purposes to determine if they continue to be highly effective in offsetting changes in fair values or cash flows of the underlying hedged items. If it is determined that the hedge is not highly effective, then hedge accounting will be discontinued prospectively.

Counterparties to Linde's derivatives are major banking institutions with credit ratings of investment grade or better. The company has Credit Support Annexes ("CSAs") in place for certain entities with their principal counterparties to minimize potential default risk and to mitigate counterparty risk. Under the CSAs, the fair values of derivatives for the purpose of interest rate and currency management are collateralized with cash on a regular basis. As of December 31, 2020, the impact of such collateral posting arrangements on the fair value of derivatives was insignificant. Management believes the risk of incurring losses on derivative contracts related to credit risk is remote and any losses would be immaterial.

The following table is a summary of the notional amount and fair value of derivatives outstanding at December 31, 2020 and 2019 for consolidated subsidiaries:

			Fair Value			
(Millions of dollars)	Notional Amounts		Assets (a)		Liabilities (a)	
December 31,	2020	2019	2020	2019	2020	2019
Derivatives Not Designated as Hedging Instruments:						
Currency contracts:						
Balance sheet items	$ 6,470	$ 7,936	$ 72	$ 62	$ 48	$ 37
Forecasted transactions	823	748	16	14	12	15
Cross-currency swaps	260	1,029	24	35	7	40
Commodity contracts	N/A	N/A	1	—	—	—
Total	$ 7,553	$ 9,713	$ 113	$ 111	$ 67	$ 92
Derivatives Designated as Hedging Instruments:						
Currency contracts:						
Balance sheet items	$ —	$ 27	$ —	$ 2	$ —	$ 3
Forecasted transactions	355	464	20	9	14	3
Commodity contracts	N/A	N/A	3	6	—	1
Interest rate swaps	1,923	1,908	64	39	—	—
Total Hedges	$ 2,278	$ 2,399	$ 87	$ 56	$ 14	$ 7
Total Derivatives	$ 9,831	$ 12,112	$ 200	$ 167	$ 81	$ 99

(a) Current assets of $110 million are recorded in prepaid and other current assets; long-term assets of $90 million are recorded in other long-term assets; current liabilities of $70 million are recorded in other current liabilities; and long-term liabilities of $11 million are recorded in other long-term liabilities.

Balance Sheet Items

Foreign currency contracts related to balance sheet items consist of forward contracts entered into to manage the exposure to fluctuations in foreign-currency exchange rates on recorded balance sheet assets and liabilities denominated in currencies other than the functional currency of the related operating unit. Certain forward currency contracts are entered into to protect underlying monetary assets and liabilities denominated in foreign currencies from foreign exchange risk and are not designated as hedging instruments. For balance sheet items that are not designated as hedging instruments, the fair value adjustments on these contracts are offset by the fair value adjustments recorded on the underlying monetary assets and liabilities.

Forecasted Transactions

Foreign currency contracts related to forecasted transactions consist of forward contracts entered into to manage the exposure to fluctuations in foreign-currency exchange rates on (1) forecasted purchases of capital-related equipment and services, (2) forecasted sales, or (3) other forecasted cash flows denominated in currencies other than the functional currency of the related operating units. For forecasted transactions that are designated as cash flow hedges, fair value adjustments are recorded to accumulated other comprehensive income ("AOCI") with deferred amounts reclassified to earnings over the same time period as the income statement impact of the associated purchase. For forecasted transactions that do not qualify for cash flow hedging relationships, fair value adjustments are recorded directly to earnings.

Cross-Currency Swaps

Cross-currency swaps are entered into to limit the foreign currency risk of future principal and interest cash flows associated with intercompany loans, and to a more limited extent bonds, denominated in non-functional currencies. The fair value adjustments on the cross-currency swaps are recorded to earnings, where they are offset by fair value adjustments on the underlying intercompany loan or bond.

Commodity Contracts

Commodity contracts are entered into to manage the exposure to fluctuations in commodity prices, which arise in the normal course of business from its procurement transactions. To reduce the extent of this risk, Linde enters into a limited number of electricity, natural gas, and propane gas derivatives. The fair value adjustments for the majority of these contracts are recorded to AOCI and are eventually offset by the income statement impact of the underlying commodity purchase. For forecasted transactions that are designated as cash flow hedges, fair value adjustments are recorded to accumulated other comprehensive income ("AOCI") with deferred amounts reclassified to earnings over the same time period as the income statement impact of the associated purchase.

Net investment hedges

As of December 31, 2020, Linde has €1.7 billion ($2.1 billion) intercompany Euro-denominated credit facility loans and intercompany loans which are designated as hedges of the net investment positions in foreign operations. Since hedge inception, exchange rate movements have increased the credit facility loan and intercompany loans by $344 million, with the offsetting loss shown within the cumulative translation component of AOCI in the consolidated balance sheets and the consolidated statements of comprehensive income.

Linde had previously designated Euro-denominated debt instruments as net investment hedges to reduce the company's exposure to changes in the currency exchange rate on investments in foreign subsidiaries with Euro functional currencies. Exchange rate movements of $206 million relating to the previously denominated Euro-denominated debt incurred in the financial periods prior to de-designation will remain in AOCI, until appropriate, such as upon sale or liquidation of the foreign operations at which time amounts will be reclassified to the consolidated statements of income. Exchange rate movements related to the Euro-denominated debt occurring after de-designation are shown in the consolidated statements of income.

Interest Rate Swaps

Linde uses interest rate swaps to hedge the exposure to changes in the fair value of financial assets and financial liabilities as a result of interest rate changes. These interest rate swaps effectively convert fixed-rate interest exposures to variable rates; fair value adjustments are recognized in earnings along with an equally offsetting charge/benefit to earnings for the changes in the fair value of the underlying financial asset or financial liability. The notional value of outstanding interest rate swaps of Linde with maturity dates from 2021 through 2028 was $1,923 million at December 31, 2020 and $1,908 million at December 31, 2019 (see Note 11 for further information).

Terminated Treasury Rate Locks

The unrecognized aggregate losses related to terminated treasury rate lock contracts on the underlying $500 million 2.20% fixed-rate notes that mature in 2022 at December 31, 2020 and December 31, 2019 was immaterial in both periods. The unrecognized gains/(losses) for the treasury rate locks are shown in AOCI and are being recognized on a straight line basis to interest expense - net over the term of the underlying debt agreements.

Impact of derivative instruments on earnings and AOCI

The following table summarizes the impact of the company's derivatives on the consolidated statements of income:

(Millions of dollars) December 31,	Amount of Pre-Tax Gain (Loss) Recognized in Earnings * 2020	2019	2018
Derivatives Not Designated as Hedging Instruments			
Currency contracts:			
Balance sheet items:			
Debt-related	$ (125)	$ 253	$ (118)
Other balance sheet items	(40)	65	3
Total	$ (165)	$ 318	$ (115)

* The gains (losses) on balance sheet items are offset by gains (losses) recorded on the underlying hedged assets and liabilities. Accordingly, the gains (losses) for the derivatives and the underlying hedged assets and liabilities related to debt items are recorded in the consolidated statements of income as interest expense-net. Other balance sheet items and anticipated net income gains (losses) are recorded in the consolidated statements of income as other income (expenses)-net.

The amounts of gain or loss recognized in AOCI and reclassified to the consolidated statement of income was immaterial for the year ended December 31, 2020. Net losses expected to be reclassified to earnings during the next twelve months are also not material.

The gains (losses) on net investment hedges are recorded as a component of AOCI within foreign currency translation adjustments in the consolidated balance sheets and the consolidated statements of comprehensive income. The gains (losses) on treasury rate locks are recorded as a component of AOCI within derivative instruments in the consolidated balance sheets and the consolidated statements of comprehensive income. The gains (losses) on net investment hedges are reclassified to earnings only when the related currency translation adjustments are required to be reclassified, usually upon sale or liquidation of the investment. The gains (losses) for interest rate contracts are reclassified to earnings as interest expense –net on a straight-line basis over the remaining maturity of the underlying debt.

NOTE 13. FAIR VALUE DISCLOSURES

The fair value hierarchy prioritizes the inputs to valuation techniques used to measure fair value into three broad levels as follows:

Level 1 – quoted prices in active markets for identical assets or liabilities
Level 2 – quoted prices for similar assets and liabilities in active markets or inputs that are observable
Level 3 – inputs that are unobservable (for example cash flow modeling inputs based on assumptions)

Assets and Liabilities Measured at Fair Value on a Recurring Basis

The following table summarizes assets and liabilities measured at fair value on a recurring basis at December 31, 2020 and 2019:

(Millions of dollars)	Fair Value Measurements Using Level 1 2020	Level 1 2019	Level 2 2020	Level 2 2019	Level 3 2020	Level 3 2019
Assets						
Derivative assets	$ —	$ —	$ 200	$ 167	$ —	$ —
Investments and securities *	21	18	—	—	47	28
Total	$ 21	$ 18	$ 200	$ 167	$ 47	$ 28
Liabilities						
Derivative liabilities	$ —	$ —	$ 81	$ 99	$ —	$ —

* Investments and securities are recorded in prepaid and other current assets and other long-term assets in the company's consolidated balance sheets.

Level 1 investments and securities are marketable securities traded on an exchange. Level 2 investments are based on market prices obtained from independent brokers or determined using quantitative models that use as their basis readily observable market parameters that are actively quoted and can be validated through external sources, including third-party pricing services, brokers and market transactions. Level 3 investments and securities consist of a venture fund. For the valuation, Linde uses the net asset value received as part of the fund's quarterly reporting, which for the most part is not based on quoted prices in active markets. In order to reflect current market conditions, Linde proportionally adjusts these by observable market data (stock exchange prices) or current transaction prices.

The level 3 investments and securities as of January 1, 2020 was $28 million. During the year ended December 31, 2020 there was approximately $3 million of foreign currency movement and $16 million in gains recognized in interest expense - net in the company's consolidated statements of income. The balance as of December 31, 2020 was $47 million.

The fair value of cash and cash equivalents, short-term debt, accounts receivable-net, and accounts payable approximate carrying value because of the short-term maturities of these instruments.

The fair value of long-term debt is estimated based on the quoted market prices for the same or similar issues. Long-term debt is categorized within either Level 1 or Level 2 of the fair value hierarchy depending on the trading volume of the issues and whether or not they are actively quoted in the market as opposed to traded through over-the-counter transactions. At December 31, 2020, the estimated fair value of Linde's long-term debt portfolio was $13,611 million versus a carrying value of $12,903 million. At December 31, 2019 the estimated fair value of Linde's long-term debt portfolio was $12,375 million versus a carrying value of $12,224 million. As Linde AG's assets and liabilities were measured at estimated fair value as of the merger date, differences between the carrying value and the fair value are not significant; remaining differences are attributable to interest rate increases subsequent to when the debt was issued and relative to stated coupon rates.

NOTE 14. EQUITY AND NONCONTROLLING INTERESTS

Linde plc Shareholders' Equity

At December 31, 2020 and 2019, Linde has total authorized share capital of €1,825,000 divided into 1,750,000,000 ordinary shares of €0.001 each, 25,000 A ordinary shares of €1.00 each, 25,000 deferred shares of €1.00 each and 25,000,000 preferred shares of €0.001 each.

At December 31, 2020 there were 552,012,862 and 523,294,529 of Linde plc ordinary shares issued and outstanding, respectively. At December 31, 2020 there were no shares of A ordinary shares, deferred shares or preferred shares issued or outstanding.

At December 31, 2019 there were 552,012,862 and 534,380,544 of Linde plc ordinary shares issued and outstanding, respectively. At December 31, 2019, there were no shares of A ordinary shares, deferred shares or preferred shares issued or outstanding.

Linde's Board of Directors may from time to time authorize the issuance of one or more series of preferred stock and, in connection with the creation of such series, determine the characteristics of each such series including, without limitation, the preference and relative, participating, optional or other special rights, and the qualifications, limitations or restrictions of the series.

Other Linde plc Ordinary Share and Treasury Stock Transactions

Linde may issue new ordinary shares for dividend reinvestment and stock purchase plans and employee savings and incentive plans. The number of new Linde ordinary shares issued from the merger date through December 31, 2019 was 958,293 shares. No new ordinary shares were issued in 2020.

On December 10, 2018 the Linde board of directors approved the repurchase of $1.0 billion of its ordinary shares under which Linde had repurchased 6,385,887 shares through December 31, 2019 (4,068,642 shares were repurchased through December 31, 2018). Linde completed the repurchases under this program in the first quarter of 2019.

On January 22, 2019 the company's board of directors approved the additional repurchase of $6.0 billion of its ordinary shares under which Linde had repurchased 24,310,534 shares through December 31, 2020 (12,016,083 shares were repurchased through December 31, 2019). This program expired on February 1, 2021.

On January 25, 2021 the Linde board of directors authorized a new share repurchase program for up to $5.0 billion of its ordinary shares expiring on July 31, 2023.

Noncontrolling Interests

Noncontrolling interest ownership changes are presented within the consolidated statements of equity. The decrease during 2020 primarily relates to the initiated buyout of minority interests in the Republic of South Africa. As of December 31, 2020, the conditions of the buyout were met obligating the company to execute in January 2021. Therefore, the company reclassified $196 million from non-controlling interest to other current liabilities reflecting the transaction price. An additional $35 million of dividends declared to the minority owners, reflected on the Dividends and other capital reductions line, was also reclassified to other current liabilities at December 31, 2020 and was paid in January 2021.

The $2,921 million decrease during 2019 was primarily driven by completion of the cash merger squeeze-out of the 8% of Linde AG shares which were not tendered in the Exchange Offer related to the merger (See Note 2).

The $186 million decrease during 2018 primarily relates to the sale of Praxair's industrial gases business in Europe (see Note 2). The "Impact of Merger" line item of the consolidated statements of equity includes the fair value of the noncontrolling interests acquired from Linde AG, including the 8% of Linde AG shares which were not tendered in the Exchange Offer that were the subject of a cash-merger squeeze-out completed in 2019 (See Note 2).

Redeemable Noncontrolling Interests

Noncontrolling interests with redemption features, such as put/sell options, that are not solely within the company’s control (“redeemable noncontrolling interests”) are reported separately in the consolidated balance sheets at the greater of carrying value or redemption value. For redeemable noncontrolling interests that are not yet exercisable, Linde calculates the redemption value by accreting the carrying value to the redemption value over the period until exercisable. If the redemption value is greater than the carrying value, any increase is adjusted directly to retained earnings and does not impact net income. At December 31, 2020, the redeemable noncontrolling interest balance includes an industrial gas business in EMEA where the noncontrolling shareholders have put options. The decrease of $100 million during 2020 relates to the full redemption of the industrial gas business in the Americas and redemption of the majority of the redeemable noncontrolling interest in the industrial gas business in EMEA.

NOTE 15. SHARE-BASED COMPENSATION

Share-based compensation expense was $133 million in 2020 ($95 million and $62 million in 2019 and 2018, respectively). The related income tax benefit recognized was $79 million in 2020 ($42 million and $30 million in 2019 and 2018, respectively). The expense was primarily recorded in selling, general and administrative expenses and no share-based compensation expense was capitalized.

Summary of Plans

The Amended and Restated 2009 Linde Long-Term Incentive Plan was initially adopted by the board of directors and shareholders of Praxair, Inc. on April 28, 2009 and has been amended since its initial adoption ("the 2009 Plan"). Upon completion of the business combination of Praxair, Inc. with Linde AG on October 31, 2018, the 2009 Plan was assumed by the company. The 2009 Plan permits awards of stock options, stock appreciation rights, restricted stock and restricted stock units, performance-based stock units and other equity awards to eligible officer and non-officer employees and non-employee directors of the company and its affiliates. As of December 31, 2020, 5,117,443 shares remained available for equity grants under the 2009 Plan, of which 1,406,647 shares may be granted as awards other than options or stock appreciation rights.

Upon the completion of the business combination, all options outstanding under the 2009 Plan were converted into options to acquire the same number of shares of the company and at the same exercise price per share that applied prior to the business combination.

Exercise prices for options granted under the 2009 Plan may not be less than the closing market price of the company’s ordinary shares on the date of grant and granted options may not be re-priced or exchanged without shareholder approval. Options granted under the 2009 Plan subject only to time vesting requirements may become partially exercisable after a minimum of one year after the date of grant but may not become fully exercisable until at least three years have elapsed from the date of grant, and all options have a maximum duration of ten years.

In connection with the business combination, on October 31, 2018 the company's Board of Directors adopted the Long Term Incentive Plan 2018 of Linde plc (“the LTIP 2018”), the purpose of which was to replace certain outstanding Linde AG equity based awards that were terminated. Under the LTIP 2018, the aggregate number of shares available for replacement option rights and replacement restricted share units was set at 473,128. As of December 31, 2020, 277,553 shares remained available for grant, and since the company was obligated to make these replacement awards only in 2019, it does not anticipate any further grants under this plan.

Exercise prices for the replacement option rights that were granted in 2019 under the LTIP 2018 were equal to EUR 1.67 ($1.92 as converted at an exchange rate from the time the exchange offer was completed as the option rights are exercisable in U.S. dollars on the NYSE) as prescribed in the business combination agreement. Each replacement option right granted under the LTIP 2018 is subject to vesting based on continued service until the end of the four-year waiting period applicable to the relevant Linde AG award that had been granted before the business combination. After vesting, each option right will be exercisable for one year.

In order to satisfy option exercises and other equity grants, the company may issue authorized but previously unissued shares or it may issue treasury shares.

Stock Option Fair Value

The company utilizes the Black-Scholes Options-Pricing Model to determine the fair value of stock options consistent with that used in prior years. Management is required to make certain assumptions with respect to selected model inputs, including anticipated changes in the underlying stock price (i.e., expected volatility) and option exercise activity (i.e., expected life). Expected volatility is based on the historical volatility of the company’s stock over the most recent period commensurate with the estimated expected life of the company’s stock options and other factors. The expected life of options granted, which represents the period of time that the options are expected to be outstanding, is based primarily on historical exercise experience. The expected dividend yield is based on the company’s most recent history and expectation of dividend payouts. The risk-free rate is based on the U.S. Treasury yield curve in effect at the time of grant for a period commensurate with the estimated expected life. If factors change and result in different assumptions in future periods, the stock option expense that the company records for future grants may differ significantly from what the company has recorded in the current period.

The weighted-average fair value of options granted during 2020 was $17.37 ($23.38 in 2019 and $19.29 in 2018) based on the Black-Scholes Options-Pricing model. The decrease in grant date fair value year-over-year is primarily attributable to the reduction in the risk-free interest rate. The weighted-average fair value of replacement option rights granted in 2019 was $160.08 based on intrinsic value method.

The following weighted-average assumptions were used to value the grants in 2020, 2019 and 2018:

Year Ended December 31,	2020	2019	2018
Dividend yield	2.2 %	2.0 %	2.1 %
Volatility	15.8 %	14.3 %	14.4 %
Risk-free interest rate	0.60 %	2.38 %	2.67 %
Expected term years	6	6	5

The following table summarizes option activity under the plans as of December 31, 2020 and changes during the period then ended (averages are calculated on a weighted basis; life in years; intrinsic value expressed in millions):

Activity	Number of Options (000's)	Average Exercise Price	Average Remaining Life	Aggregate Intrinsic Value
Outstanding at January 1, 2020	9,297	$ 127.04		
Granted	1,155	173.16		
Exercised	(2,205)	115.34		
Cancelled or expired	(180)	162.97		
Outstanding at December 31, 2020	8,067	$ 136.05	6.0	$ 1,028
Exercisable at December 31, 2020	5,707	$ 123.93	5.0	$ 797

The aggregate intrinsic value represents the difference between the company's closing stock price of $263.51 as of December 31, 2020 and the exercise price multiplied by the number of in the money options outstanding as of that date. The total intrinsic value of stock options exercised during 2020 was $264 million ($219 million and $113 million in 2019 and 2018, respectively).

Cash received from option exercises under all share-based payment arrangements for 2020 was $36 million ($64 million and $66 million in 2019 and 2018, respectively). The cash tax benefit realized from share-based compensation totaled $70 million for 2020 ($56 million and $30 million cash tax benefit in 2019 and 2018, respectively).

As of December 31, 2020, $17 million of unrecognized compensation cost related to non-vested stock options is expected to be recognized over a weighted-average period of approximately 1 year.

Performance-Based and Restricted Stock Awards

In 2020, the company granted 224,045 performance-based stock awards under the 2009 Plan to senior management that vest, subject to the attainment of pre-established minimum performance criteria, principally on the third anniversary of their date of grant. These awards are tied to either after tax return on capital ("ROC") performance or relative total shareholder return ("TSR") performance versus that of the S&P 500 (weighted 67%) and Eurofirst 300 (weighted 33%). The actual number of shares issued in settlement of a vested award can range from zero to 200 percent of the target number of shares granted based upon the company's attainment of specified performance targets at the end of a three-year period. Compensation expense related to these awards is recognized over the three-year performance period based on the fair value of the closing market price of the company's ordinary shares on the date of the grant and the estimated performance that will be achieved. Compensation expense for ROC awards will be adjusted during the three-year performance period based upon the estimated performance levels that will be achieved. TSR awards are measured at their grant date fair value and not subsequently re-measured.

The weighted-average fair value of ROC performance-based stock awards granted in 2020 was $161.56, and during 2019 was $168.47. These fair values are based on the closing market price of Linde's ordinary shares on the grant date adjusted for dividends that will not be paid during the vesting period. There were no ROC performance-based stock awards granted in 2018.

The weighted-average fair value of performance-based stock tied to relative TSR performance granted in 2020 was $198.61, and during 2019 was $215.85, and was estimated using a Monte Carlo simulation performed as of the grant date. There were no performance-based stock tied to relative TSR performance granted in 2018.

There were 185,973 restricted stock units granted to employees by Linde during 2020. The weighted-average fair value of restricted stock units granted during 2020 was $174.95 ($165.04 in 2019 and $144.86 in 2018). These fair values are based on the closing market price of Linde's ordinary shares on the grant date adjusted for dividends that will not be paid during the vesting period. Compensation expense related to the restricted stock units is recognized over the vesting period.

The following table summarizes non-vested performance-based and restricted stock award activity as of December 31, 2020 and changes during the period then ended (shares based on target amounts, averages are calculated on a weighted basis):

	Performance-Based		Restricted Stock	
	Number of Shares (000's)	Average Grant Date Fair Value	Number of Shares (000's)	Average Grant Date Fair Value
Non-vested at January 1, 2020	246	$ 184.29	884	$ 129.43
Granted	224	174.70	186	174.95
Vested	—	—	(355)	117.62
Cancelled and Forfeited	(33)	178.27	(27)	160.90
Non-vested at December 31, 2020	437	$ 179.76	688	$ 148.56

There are approximately 10 thousand performance-based shares and 12 thousand restricted stock shares that are non-vested at December 31, 2020 which will be settled in cash due to foreign regulatory limitations. The liability related to these grants reflects the current estimate of performance that will be achieved and the current share price.

As of December 31, 2020, $42 million of unrecognized compensation cost related to performance-based awards and $21 million of unrecognized compensation cost related to the restricted stock awards is expected to be recognized primarily through the first quarter of 2023.

NOTE 16. RETIREMENT PROGRAMS

Defined Benefit Pension Plans - U.S.

Linde has two main U.S. retirement programs which are non-contributory defined benefit plans: the Linde U.S. Pension Plan and the CBI Pension Plan. The latter program benefits primarily former employees of CBI Industries, Inc. which Linde acquired in 1996. Effective July 1, 2002, the Linde U.S. Pension Plan was amended to give participating employees a one-time choice to remain covered by the old formula or to elect coverage under a new formula. The old formula is based predominantly on years of service, age and compensation levels prior to retirement, while the new formula provides for an annual contribution to an individual account which grows with interest each year at a predetermined rate. Also, this new formula applies to all new employees hired after April 30, 2002 into businesses adopting this plan. The U.S. and non-U.S. pension plan assets are comprised of a diversified mix of investments, including U.S. and non-U.S. corporate equities, government securities and corporate debt securities. Linde has several plans that provide supplementary retirement benefits primarily to higher level employees that are unfunded and are nonqualified for federal tax purposes. Pension coverage for employees of certain of Linde's international subsidiaries generally is provided by those companies through separate plans. Obligations under such plans are primarily provided for through diversified investment portfolios, with some smaller plans provided for under insurance policies or by book reserves.

Defined Benefit Pension Plans - International

Linde has international, defined benefit commitments primarily in Germany and the U.K. The defined benefit commitments in Germany relate to old age pensions, invalidity pensions and surviving dependents pensions. These commitments also take into account vested rights for periods of service prior to January 1, 2002 based on earlier final-salary pension plan rules. In addition, there are direct commitments in respect of the salary conversion scheme for the form of cash balance plans. The resulting pension payments are calculated on the basis of an interest guarantee and the performance of the corresponding investment. There are no minimum funding requirements. The pension obligations in Germany are partly funded by a Contractual Trust Agreement (CTA). Defined benefit commitments in the U.K. prior to July 1, 2003 are earnings-related and dependent on the period of service. Such commitments relate to old age pensions, invalidity pensions and surviving dependents pensions. Beginning in April

1, 2011, the amount of future increases in inflation-linked pensions and of increases in pensionable emoluments was restricted.

Multi-employer Pension Plans

In the United States Linde participates in eight multi-employer defined benefit pension plans ("MEPs"), pursuant to the terms of collective bargaining agreements, that cover approximately 200 union-represented employees. The collective bargaining agreements expire on different dates through 2026. In connection with such agreements, the company is required to make periodic contributions to the MEPs in accordance with the terms of the respective collective bargaining agreements. Linde's participation in these plans is not material either at the plan level or in the aggregate. Linde's contributions to these plans were $2 million in 2020, 2019, and 2018 (these costs are not included in the tables that follow). For all MEPs, Linde's contributions were significantly less than 1% of the total contributions to each plan for 2019 and 2018. Total 2020 contributions were not yet available from the MEPs.

Linde has obtained the most recently available Pension Protection Act ("PPA") annual funding notices from the Trustees of the MEPs. The PPA classifies MEPs as either Red, Yellow or Green Zone plans. Among other factors, plans in the Red Zone are generally less than 65 percent funded with a projected insolvency date within the next twenty years; plans in the Yellow Zone are generally 65 to 80 percent funded; and plans in the Green Zone are generally at least 80 percent funded. Red Zone plans are considered to be in "critical" or "critical and declining" status, while Yellow Zone plans are considered to be in "endangered" status. Plans that are in neither "critical" nor "endangered" status are considered to have Green Zone status. According to the most recent data available, four of the MEPs that the company participates in are in a Red Zone status and four are in a Green Zone status. As of December 31, 2020, the four Red Zone plans have pending or have implemented financial improvement or rehabilitation plans. Linde does not currently anticipate significant future obligations due to the funding status of these plans. If Linde determined it was probable that it would withdraw from an MEP, the company would record a liability for its portion of the MEP's unfunded pension obligations, as calculated at that time. Historically, such withdrawal payments have not been significant.

Defined Contribution Plans

Linde's U.S. business employees are eligible to participate in the Linde defined contribution savings plan. Employees may contribute up to 40% of their compensation, subject to the maximum allowable by IRS regulations. For the U.S. packaged gases business, company contributions to this plan are calculated as a percentage of salary based on age plus service. U.S. employees other than those in the packaged gases business have company contributions to this plan calculated on a graduated scale based on employee contributions to the plan. The cost for these defined contribution plans was $46 million in 2020, $47 million in 2019 and $33 million in 2018 (these costs are not included in the tables that follow).

The defined contribution plans include a non-leveraged employee stock ownership plan ("ESOP") which covers all employees participating in this plan. The collective number of shares of Linde ordinary shares in the ESOP totaled 1,872,450 at December 31, 2020.

Certain international subsidiaries of the company also sponsor defined contribution plans where contributions are determined under various formulas. The expense for these plans was $106 million in 2020, $95 million in 2019 and $32 million in 2018 (these expenses are not included in the tables that follow).

Postretirement Benefits Other Than Pensions (OPEB)

Linde provides health care and life insurance benefits to certain eligible retired employees. These benefits are provided through various insurance companies and healthcare providers. The company does not currently fund its postretirement benefits obligations. Linde's retiree plans may be changed or terminated by Linde at any time for any reason with no liability to current or future retirees.

Linde uses a measurement date of December 31 for its pension and other post-retirement benefit plans.

Pension and Postretirement Benefit Costs

The components of net pension and postretirement benefits other than pension ("OPEB") costs for 2020, 2019 and 2018 are shown in the table below (2018 reflects the impact of the Linde AG merger on October 31, 2018 and the divestiture of Praxair's European industrial gases business on December 3, 2018 (see Note 2)):

(Millions of dollars) Year Ended December 31,	Pensions 2020	2019	2018	OPEB 2020	2019	2018
Amount recognized in Operating Profit						
Service cost	$ 150	$ 142	$ 74	$ 2	$ 2	$ 2
Amount recognized in Net pension and OPEB cost (benefit), excluding service cost						
Interest cost	208	261	128	5	7	5
Expected return on plan assets	(482)	(462)	(219)	—	—	—
Net amortization and deferral	90	61	71	(4)	(4)	(3)
Curtailment and termination benefits (a)	—	8	—	—	—	—
Settlement charges (b)	6	97	14	—	—	—
	$ (178)	$ (35)	$ (6)	$ 1	$ 3	$ 2
Amount recognized in Net gain on sale of businesses						
Settlement gains from divestitures (c)	—	—	(44)	—	—	—
Net periodic benefit cost (benefit)	$ (28)	$ 107	$ 24	$ 3	$ 5	$ 4

(a) In 2019, Linde recorded curtailment gains of $9 million and a charge of $17 million for termination benefits, primarily in connection with a defined benefit pension plan freeze.

(b) In the third quarter of 2020, Linde recorded a pension settlement charge of $6 million triggered by lump sum benefit payments made from a U.S. non-qualified plan.

In the first quarter of 2019, benefits of $91 million were paid related to the settlement of a U.S. non-qualified plan. Such benefits were triggered by a change in control provision and resulted in a settlement charge of $51 million. In the third and fourth quarters of 2019, Linde recorded pension settlement charges of $40 million and $6 million, respectively, related to lump sum payments made from a U.S. qualified plan. These payments were triggered by merger-related divestitures.

2018 includes the impact of a $4 million charge and a $10 million charge recorded in the third and fourth quarters, respectively. In the third quarter, a series of lump sum benefit payments made from the U.S. supplemental pension plan triggered a settlement of the related pension obligation. In the fourth quarter, a change in control provision triggered the settlement of a U.S. non-qualified plan.

(c) In connection with Praxair merger-related divestitures, primarily the European industrial gases business, certain European pension plan obligations were settled. This resulted in the recognition of associated pension benefit obligations and deferred losses in accumulated other comprehensive income (loss) within operating profit in the "Net gain on sale of businesses" line item.

Funded Status

Changes in the benefit obligation and plan assets for Linde's pension and OPEB programs, including reconciliation of the funded status of the plans to amounts recorded in the consolidated balance sheet, as of December 31, 2020 and 2019 are shown below.

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(Millions of dollars) Year Ended December 31,	Pensions 2020 U.S.	Pensions 2020 International	Pensions 2019 U.S.	Pensions 2019 International	OPEB 2020	OPEB 2019
Change in Benefit Obligation ("PBO")						
Benefit obligation, January 1	$ 2,552	$ 8,689	$ 2,508	$ 7,533	$ 192	$ 184
Service cost	37	113	38	104	2	2
Interest cost	68	140	81	180	5	7
Divestitures	—	—	(1)	—	—	—
Participant contributions	—	18	—	20	11	8
Plan amendment	—	7	—	13	(13)	—
Actuarial loss (gain)	250	893	266	1,045	(2)	8
Benefits paid	(152)	(320)	(105)	(333)	(22)	(20)
Plan settlement	(9)	(14)	(235)	—	—	—
Plan curtailment	—	(1)	—	(9)	—	2
Foreign currency translation and other changes	—	462	—	136	(1)	1
Benefit obligation, December 31	$ 2,746	$ 9,987	$ 2,552	$ 8,689	$ 172	$ 192
Accumulated benefit obligation ("ABO")	$ 2,646	$ 9,830	$ 2,464	$ 8,553		
Change in Plan Assets						
Fair value of plan assets, January 1	$ 2,048	$ 6,888	$ 1,952	$ 6,292	$ —	$ —
Actual return on plan assets	386	641	341	598	—	—
Company contributions	25	66	—	94	—	—
Participant contributions	—	18	—	20	—	—
Benefits paid from plan assets	(149)	(267)	(244)	(268)	—	—
Divestitures	—	—	(1)	—	—	—
Foreign currency translation and other changes	—	307	—	152	—	—
Fair value of plan assets, December 31	$ 2,310	$ 7,653	$ 2,048	$ 6,888	$ —	$ —
Funded Status, End of Year	$ (436)	$ (2,334)	$ (504)	$ (1,801)	$ (172)	$ (192)
Recorded in the Balance Sheet (Note 7)						
Other long-term assets	$ 2	$ 53	$ —	$ 78	$ —	$ —
Other current liabilities	(9)	(13)	(6)	(10)	(12)	(11)
Other long-term liabilities	(429)	(2,374)	(498)	(1,869)	(160)	(181)
Net amount recognized, December 31	$ (436)	$ (2,334)	$ (504)	$ (1,801)	$ (172)	$ (192)
Amounts recognized in accumulated other comprehensive income (loss) consist of:						
Net actuarial loss (gain)	$ 687	$ 1,766	$ 753	$ 1,110	$ (11)	$ (10)
Prior service cost (credit)	—	9	—	4	(15)	(4)
Deferred tax benefit (Note 7)	(182)	(383)	(190)	(251)	5	(5)
Amount recognized in accumulated other comprehensive income (loss) (Note 7)	$ 505	$ 1,392	$ 563	$ 863	$ (21)	$ (19)

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Comparative funded status information as of December 31, 2020 and 2019 for select international pension plans is presented in the table below as the benefit obligations of these plans are considered to be significant relative to the total benefit obligation:

(Millions of dollars)	United Kingdom 2020	Germany 2020	Other International 2020	Total International 2020
Benefit obligation, December 31	$ 6,012	$ 2,582	$ 1,393	$ 9,987
Fair value of plan assets, December 31	5,355	1,258	1,040	7,653
Funded Status, End of Year	$ (657)	$ (1,324)	$ (353)	$ (2,334)

(Millions of dollars)	United Kingdom 2019	Germany 2019	Other International 2019	Total International 2019
Benefit obligation, December 31	$ 5,221	$ 2,180	$ 1,288	$ 8,689
Fair value of plan assets, December 31	4,777	1,119	992	6,888
Funded Status, End of Year	$ (444)	$ (1,061)	$ (296)	$ (1,801)

The changes in plan assets and benefit obligations recognized in other comprehensive income in 2020 and 2019 are as follows:

	Pensions		OPEB	
(Millions of dollars)	2020	2019	2020	2019
Current year net actuarial losses (gains)*	$ 598	$ 834	$ (2)	$ 8
Amortization of net actuarial gains (losses)	(89)	(59)	2	3
Plan amendment	7	(4)	(13)	—
Amortization of prior service credits (costs)	(1)	(2)	2	1
Pension settlements	(6)	(97)	—	—
Curtailments	(1)	—	—	2
Foreign currency translation and other changes	87	12	(1)	—
Total recognized in other comprehensive income	$ 595	$ 684	$ (12)	$ 14

* Pension net actuarial losses in 2020 and 2019 are largely driven by lower discount rates across all significant pension plans. In the U.S., the benefit from the actual return on assets in both 2020 and 2019 largely offset the actuarial loss generated from a higher PBO, resulting from the low discount rate environment. For the international plans, the unfavorable impact of lower discount rates outweighed favorable plan asset experience in both years. OPEB net actuarial gains in 2020 relate to the favorable impact of liability experience and demographic assumptions, which more than outweighed the adverse impact of lower year-over-year discount rates. OPEB net actuarial losses in 2019 relate to the low interest rate environment, which was partially offset by favorable actual benefit payment experience.

The following table provides information for pension plans where the accumulated benefit obligation exceeds the fair value of plan assets:

	Pensions			
	2020		2019	
(Millions of dollars) **Year Ended December 31,**	**U.S.**	**International**	**U.S.**	**International**
Accumulated benefit obligation ("ABO")	$ 2,518	$ 8,694	$ 2,464	$ 7,664
Fair value of plan assets	$ 2,180	$ 6,254	$ 2,048	$ 5,849

The following table provides information for pension plans where the projected benefit obligation exceeds the fair value of plan assets:

(Millions of dollars) Year Ended December 31,	Pensions 2020 U.S.	Pensions 2020 International	Pensions 2019 U.S.	Pensions 2019 International
Projected benefit obligation ("PBO")	$ 2,618	$ 8,845	$ 2,552	$ 7,810
Fair value of plan assets	$ 2,180	$ 6,282	$ 2,048	$ 5,872

Assumptions

The assumptions used to determine benefit obligations are as of the respective balance sheet dates and the assumptions used to determine net benefit cost are as of the previous year-end, as shown below:

	Pensions U.S. 2020	Pensions U.S. 2019	Pensions International 2020	Pensions International 2019	OPEB 2020	OPEB 2019
Weighted average assumptions used to determine benefit obligations at December 31,						
Discount rate	2.40 %	3.20 %	1.36 %	1.91 %	2.39 %	3.19 %
Interest crediting rate	1.57 %	2.19 %	1.01 %	1.08 %	N/A	N/A
Rate of increase in compensation levels	3.25 %	3.25 %	2.55 %	2.46 %	N/A	N/A
Weighted average assumptions used to determine net periodic benefit cost for years ended December 31,						
Discount rate	3.20 %	4.20 %	1.91 %	2.72 %	3.19 %	4.16 %
Interest crediting rate	2.19 %	3.34 %	1.08 %	1.23 %	N/A	N/A
Rate of increase in compensation levels	3.25 %	3.25 %	2.46 %	2.38 %	N/A	N/A
Expected long-term rate of return on plan assets (1)	7.00 %	7.27 %	5.31 %	5.15 %	N/A	N/A

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(1) The expected long term rate of return on the U.S. and international plan assets is estimated based on the plans' investment strategy and asset allocation, historical capital market performance and, to a lesser extent, historical plan performance. For the U.S. plans, the expected rate of return of 7.00% was derived based on the target asset allocation of 40%-60% equity securities (approximately 7.7% expected return), 30%-50% fixed income securities (approximately 5.4% expected return) and 5%-15% alternative investments (approximately 6.3% expected return). For the international plans, the expected rate of return was derived based on the weighted average target asset allocation of 15%-25% equity securities (approximately 6.4% expected return), 30%-50% fixed income securities (approximately 4.8% expected return), and 30%-50% alternative investments (approximately 5% expected return). For the U.S. plan assets, the actual annualized total return for the most recent 10-year period ended December 31, 2020 was approximately 9.5%. For the international plan assets, the actual annualized total return for the same period was approximately 7.9%. Changes to plan asset allocations and investment strategy over this time period limit the value of historical plan performance as factor in estimating the expected long term rate of return. For 2021, the expected long-term rate of return on plan assets will be 7.00% for the U.S. plans. For 2021, the expected weighted average long-term rate of return for international plans will be 5.27%.

Assumed healthcare cost trend rates	OPEB 2020	OPEB 2019
Historical Praxair, Inc. plans		
Healthcare cost trend assumed	6.50 %	7.00 %
Rate to which the cost trend rate is assumed to decline (the ultimate trend rate)	5.00 %	5.00 %
Year that the rate reaches the ultimate trend rate	2027	2027
Historical Linde AG plans		
Healthcare cost trend assumed	6.50 %	5.49 %
Rate to which the cost trend rate is assumed to decline (the ultimate trend rate)	5.00 %	4.50 %
Year that the rate reaches the ultimate trend rate	2027	2038

Pension Plan Assets

The investments of the U.S. pension plan are managed to meet the future expected benefit liabilities of the plan over the long term by investing in diversified portfolios consistent with prudent diversification and historical and expected capital market returns. Investment strategies are reviewed by management and investment performance is tracked against appropriate benchmarks. There are no concentrations of risk as it relates to the assets within the plans. The international pension plans are managed individually based on diversified investment portfolios, with different target asset allocations that vary for each plan. Weighted-average asset allocations at December 31, 2020 and 2019 for Linde's U.S. and international pension plans, as well as respective asset allocation ranges by major asset category, are generally as follows:

	U.S.				International			
Asset Category	**Target 2020**	**Target 2019**	**2020**	**2019**	**Target 2020**	**Target 2019**	**2020**	**2019**
Equity securities	40%-60%	40%-60%	66 %	55 %	15%-25%	15%-25%	27 %	23 %
Fixed income securities	30%-50%	30%-50%	27 %	30 %	30%-50%	30%-50%	34 %	41 %
Other	5%-15%	5%-15%	7 %	15 %	30%-50%	30%-50%	39 %	36 %

The following table summarizes pension assets measured at fair value by asset category at December 31, 2020 and 2019. For the twelve months ended December 31, 2020, transfers of assets of $15 million into Level 3 include insurance contract and real estate investments of $11 million and $4 million, respectively, which were reclassified as there is no active market quotation available. See Note 13 for the definition of levels within the fair value hierarchy:

(Millions of dollars)	Level 1 2020	Level 1 2019	Level 2 2020	Level 2 2019	Level 3 ** 2020	Level 3 ** 2019	Total 2020	Total 2019
	Fair Value Measurements Using							
Cash and cash equivalents	$ 524	$ 436	$ —	$ —	$ —	$ —	$ 524	$ 436
Equity securities:								
Global equities	1,974	1,395	—	—	—	—	1,974	1,395
Mutual funds	324	110	—	52	—	—	324	162
Fixed income securities:								
Government bonds	—	—	1,545	1,642	—	—	1,545	1,642
Emerging market debt	—	—	520	459	—	—	520	459
Mutual funds	123	225	12	14	—	—	135	239
Corporate bonds	—	—	573	401	—	—	573	401
Bank loans	—	—	242	210	—	—	242	210
Alternative investments:								
Real estate funds	—	—	—	—	335	316	335	316
Private debt	—	—	—	—	1,120	1,003	1,120	1,003
Insurance contracts	—	—	—	—	11	—	11	—
Liquid alternative	—	—	1,083	1,087	—	—	1,083	1,087
Other investments	—	—	60	33	—	—	60	33
Total plan assets at fair value, December 31,	$ 2,945	$ 2,166	$ 4,035	$ 3,898	$ 1,466	$ 1,319	$ 8,446	$ 7,383
Pooled funds *							1,517	1,553
Total fair value plan assets December 31,							$ 9,963	$ 8,936

* Pooled funds are measured using the net asset value ("NAV") as a practical expedient for fair value as permissible under the accounting standard for fair value measurements and have not been categorized in the fair value hierarchy.

** The following table summarizes changes in fair value of the pension plan assets classified as level 3 for the periods ended December 31, 2020 and 2019:

(Millions of dollars)	Insurance Contracts	Real Estate Funds	Private Debt	Total
Balance, December 31, 2018	$ —	$ 298	$ 671	$ 969
Gain/(Loss) for the period	—	24	30	54
Acquisitions	—	—	14	14
Purchases	—	26	304	330
Sales	—	(22)	(33)	(55)
Transfer into/ (out of) Level 3	—	(10)	—	(10)
Foreign currency translation	—	—	17	17
Balance, December 31, 2019	$ —	$ 316	$ 1,003	$ 1,319
Gain/(Loss) for the period	—	(10)	4	(6)
Purchases	—	21	137	158
Sales	—	(10)	(69)	(79)
Transfer into / (out of) Level 3	11	4	—	15
Foreign currency translation	—	14	45	59
Balance, December 31, 2020	$ 11	$ 335	$ 1,120	$ 1,466

The descriptions and fair value methodologies for the company's pension plan assets are as follows:

Cash and Cash Equivalents – This category includes cash and short-term interest bearing investments with maturities of three months or less. Investments are valued at cost plus accrued interest. Cash and cash equivalents are classified within level 1 of the valuation hierarchy.

Equity Securities – This category is comprised of shares of common stock in U.S. and international companies from a diverse set of industries and size. Common stock is valued at the closing market price reported on a U.S. or international exchange where the security is actively traded. Equity securities are classified within level 1 of the valuation hierarchy.

Mutual Funds – These categories consist of publicly and privately managed funds that invest primarily in marketable equity and fixed income securities. The fair value of these investments is determined by reference to the net asset value of the underlying securities of the fund. Shares of publicly traded mutual funds are valued at the net asset value quoted on the exchange where the fund is traded and are primarily classified as level 1 within the valuation hierarchy.

U.S. and International Government Bonds – This category includes U.S. treasuries, U.S. federal agency obligations and international government debt. The majority of these investments do not have quoted market prices available for a specific government security and so the fair value is determined using quoted prices of similar securities in active markets and is classified as level 2 within the valuation hierarchy.

Corporate Bonds – This category is comprised of corporate bonds of U.S. and international companies from a diverse set of industries and size. The fair values for U.S. and international corporate bonds are determined using quoted prices of similar securities in active markets and observable data or broker or dealer quotations. The fair values for these investments are classified as level 2 within the valuation hierarchy.

Pooled Funds - Pooled fund NAVs are provided by the trustee and are determined by reference to the fair value of the underlying securities of the trust, less its liabilities, which are valued primarily through the use of directly or indirectly observable inputs. Depending on the pooled fund, underlying securities may include marketable equity securities or fixed income securities.

Bank Loans - This category is comprised of traded syndicated loans of larger corporate borrowers. Such loans are issued by sub-investment grade rated companies both in the U.S. and internationally and are syndicated by investment banks to institutional investors. They are regularly traded in an active dealer market comprised of large investment banks, which supply bid and offer quotes and are therefore classified within level 2 of the valuation hierarchy.

Liquid Alternative Investments - This category is comprised of investments in alternative mutual funds whose holdings include liquid securities, cash, and derivatives. Such funds focus on diversification and employ a variety of investing strategies including long/short equity, multi-strategy, and global macro. The fair value of these investments is determined by reference to the net asset value of the underlying holdings of the fund, which can be determined using observable data (e.g., indices, yield curves, quoted prices of similar securities), and is classified within level 2 of the valuation hierarchy.

Insurance Contracts – This category is comprised of purchased annuity insurance contracts (annuity contract buy-ins) and is intended to mitigate the Company's exposure to certain risks, such as longevity risk. The fair value is calculated based on the cash surrender value of the purchased annuity insurance contract, which is determined based on such factors as the fair value of the underlying assets and discounted cash flows. These contracts are with highly rated insurance companies. Insurance contracts are classified within level 3 of the valuation hierarchy.

Real Estate Funds – This category includes real estate properties, partnership equities and investments in operating companies. The fair value of the assets is determined using discounted cash flows by estimating an income stream for the property plus a reversion into a present value at a risk adjusted rate. Yield rates and growth assumptions utilized are derived from market transactions as well as other financial and industry data. The fair value for these investments are classified within level 3 of the valuation hierarchy.

Private Debt - This category includes non-traded, privately-arranged loans between one or a small group of private debt investment managers and corporate borrowers, which are typically too small to access the syndicated market and have no credit rating. This category also includes similar loans to real estate companies or individual properties. Loans included in this category are valued at par value, are held to maturity or to call, and are classified within level 3 of the valuation hierarchy.

Contributions

At a minimum, Linde contributes to its pension plans to comply with local regulatory requirements (e.g., ERISA in the United States). Discretionary contributions in excess of the local minimum requirements are made based on many factors, including long-term projections of the plans' funded status, the economic environment, potential risk of overfunding, pension insurance costs and alternative uses of the cash. Changes to these factors can impact the timing of discretionary contributions from year to year. Pension contributions were $91 million in 2020, $94 million in 2019 and $87 million in 2018. Estimated required contributions for 2021 are currently expected to be in the range of $70 million to $80 million.

Estimated Future Benefit Payments

The following table presents estimated future benefit payments, net of participant contributions:

(Millions of dollars)	Pensions		
Year Ended December 31,	**U.S.**	**International**	**OPEB**
2021	$ 175	$ 360	$ 13
2022	146	360	12
2023	148	371	12
2024	151	380	11
2025	155	389	10
2026-2030	771	1,046	44

NOTE 17. COMMITMENTS AND CONTINGENCIES

The company accrues non income-tax liabilities for contingencies when management believes that a loss is probable and the amounts can be reasonably estimated, while contingent gains are recognized only when realized. In the event any losses are sustained in excess of accruals, they will be charged against income at that time. Attorney fees are recorded as incurred. Commitments represent obligations, such as those for future purchases of goods or services, that are not yet recorded on the company's balance sheet as liabilities. The company records liabilities for commitments when incurred (i.e., when the goods or services are received).

Contingent Liabilities

Linde is subject to various lawsuits and government investigations that arise from time to time in the ordinary course of business. These actions are based upon alleged environmental, tax, antitrust and personal injury claims, among others. Linde has strong defenses in these cases and intends to defend itself vigorously. It is possible that the company may incur losses in connection with some of these actions in excess of accrued liabilities. Management does not anticipate that in the aggregate such losses would have a material adverse effect on the company's consolidated financial position or liquidity; however, it is possible that the final outcomes could have a significant impact on the company's reported results of operations in any given period.

Significant matters are:

- During 2009, the Brazilian government published Law 11941/2009 instituting a new voluntary amnesty program ("Refis Program") which allowed Brazilian companies to settle certain federal tax disputes at reduced amounts. During 2009, the company decided that it was economically beneficial to settle many of its outstanding federal tax disputes and such disputes were enrolled in the Refis Program, subject to final calculation and review by the Brazilian federal government. The company recorded estimated liabilities based on the terms of the Refis Program. Since 2009, Linde has been unable to reach final agreement on the calculations and initiated litigation against the government in an attempt to resolve certain items. Open issues relate to the following matters: (i) application of cash deposits and net operating loss carryforwards to satisfy obligations and (ii) the amount of tax reductions available under the Refis Program. It is difficult to estimate the timing of resolution of legal matters in Brazil.
- At December 31, 2020 the most significant non-income and income tax claims in Brazil, after enrollment in the Refis Program, relate to state VAT tax matters and a federal income tax matter where the taxing authorities are challenging the tax rate that should be applied to income generated by a subsidiary company. The total estimated exposure relating to such claims, including interest and penalties, as appropriate, is approximately $205 million. Linde has not recorded any liabilities related to such claims based on management judgments, after considering judgments and opinions of outside counsel. Because litigation in Brazil historically takes many years to resolve, it is very difficult to estimate the timing of resolution of these matters; however, it is possible that certain of these matters may be resolved within the near term. The company is vigorously defending against the proceedings.
- On September 1, 2010, CADE (Brazilian Administrative Council for Economic Defense) announced alleged anticompetitive activity on the part of five industrial gas companies in Brazil and imposed fines. Originally, CADE imposed a civil fine of R$2.2 billion Brazilian reais ($423 million) on White Martins, the Brazil-based subsidiary of Praxair, Inc. The fine was reduced to R$1.7 billion Brazilian reais ($327 million) due to a calculation error made by CADE. The fine against White Martins was overturned by the Ninth Federal Court of Brasilia. CADE appealed this decision, and the Federal Court of Appeals rejected CADE's appeal and confirmed the decision of the Ninth Federal Court of Brasilia. CADE has filed an appeal with the Superior Court of Justice and a decision is pending.

  Similarly, on September 1, 2010, CADE imposed a civil fine of R$237 million Brazilian reais ($46 million) on Linde Gases Ltda., the former Brazil-based subsidiary of Linde AG, which was divested to MG Industries GmbH on March 1, 2019 and with respect to which Linde provided a contractual indemnity. The fine was reduced to R$188 million Brazilian reais ($36 million) due to a calculation error made by CADE. The fine against Linde Gases Ltda. was overturned by the Seventh Federal Court in Brasilia. CADE appealed this decision, and the Federal Court of Appeals rejected CADE's appeal and confirmed the decision of the Seventh Federal Court of Brasilia. CADE filed an appeal with the Superior Court of Justice, and a final decision is pending.

Linde has strong defenses and is confident that it will prevail on appeal and have the fines overturned. Linde strongly believes that the allegations of anticompetitive activity against our current and former Brazilian subsidiaries are not supported by valid and sufficient evidence. Linde believes that this decision will not stand up to judicial review and deems the possibility of cash outflows to be extremely unlikely. As a result, no reserves have been recorded as management does not believe that a loss from this case is probable.

- On and after April 23, 2019 former shareholders of Linde AG filed appraisal proceedings at the District Court (Landgericht) Munich I (Germany), seeking an increase of the cash consideration paid in connection with the previously completed cash merger squeeze-out of all of Linde AG’s minority shareholders for €189.46 per share. Any such increase would apply to all 14,763,113 Linde AG shares that were outstanding on April 8, 2019, when the cash merger squeeze-out was completed. The period for plaintiffs to file claims expired on July 9, 2019. The company believes the consideration paid was fair and that the claims lack merit, and no reserve has been established. We cannot estimate the timing of resolution.

Commitments

At December 31, 2020, Linde had undrawn outstanding letters of credit, bank guarantees and surety bonds valued at approximately $2,905 million from financial institutions. These relate primarily to customer contract performance guarantees (including plant construction in connection with certain on-site contracts), self-insurance claims and other commercial and governmental requirements, including non-U.S. litigation matters.

Other commitments related to leases, tax liabilities for uncertain tax positions, long-term debt, other post retirement and pension obligations are summarized elsewhere in the financial statements (see Notes 4, 5, 11, and 16).

NOTE 18. SEGMENT INFORMATION

Linde’s operations consist of two major product lines: industrial gases and engineering. As further described in the following paragraph, Linde’s industrial gases operations are managed on a geographic basis, which represent three of the company's reportable segments - Americas, EMEA (Europe/Middle East/Africa), and APAC (Asia/South Pacific); a fourth reportable segment which represents the company's Engineering business, designs and manufactures equipment for air separation and other industrial gas applications specifically for end customers and is managed on a worldwide basis operating in all three geographic segments. Other consists of corporate costs and a few smaller businesses which individually do not meet the quantitative thresholds for separate presentation.

The industrial gases product line centers on the manufacturing and distribution of atmospheric gases (oxygen, nitrogen, argon, rare gases) and process gases (carbon dioxide, helium, hydrogen, electronic gases, specialty gases, acetylene). Many of these products are co-products of the same manufacturing process. Linde manufactures and distributes nearly all of its products and manages its customer relationships on a regional basis. Linde’s industrial gases are distributed to various end-markets within a regional segment through one of three basic distribution methods: on-site or tonnage; merchant or bulk; and packaged or cylinder gases. The distribution methods are generally integrated in order to best meet the customer’s needs and very few of its products can be economically transported outside of a region. Therefore, the distribution economics are specific to the various geographies in which the company operates and are consistent with how management assesses performance.

The company’s measure of profit/loss for segment reporting is segment operating profit. Segment operating profit is defined as operating profit excluding purchase accounting impacts of the Linde AG merger, intercompany royalties, and items not indicative of ongoing business trends. This is the manner in which the company’s CODM assesses performance and allocates resources. Similarly, total assets have not been included as this is not provided to the CODM for their assessment.

The table below presents information about reportable segments for the years ended December 31, 2020, 2019 and 2018. The years ended December 31, 2020 and 2019 reflect the results of the combined business for the entire year. The year ended December 31, 2018 reflects the results of Praxair for the entire year and the results of Linde AG for the period beginning after October 31, 2018 (the merger date).

(Millions of dollars)	2020	2019	2018
Sales (a)			
Americas	$ 10,459	$ 10,989	$ 8,017
EMEA	6,449	6,643	2,644
APAC	5,687	5,779	2,446
Engineering	2,851	2,799	459
Other	1,797	1,953	1,270
Total Segment Sales	27,243	28,163	14,836
Merger-related divestitures	—	65	—
Total Sales	$ 27,243	$ 28,228	$ 14,836

	2020	2019	2018
Segment Operating Profit			
Americas	$ 2,773	$ 2,577	$ 2,053
EMEA	1,465	1,367	481
APAC	1,277	1,184	465
Engineering	435	390	14
Other	(153)	(246)	(37)
Reported Segment operating profit	5,797	5,272	2,976
Cost reduction programs and other charges (Note 3)	(506)	(567)	(309)
Net gain on sale of business	—	164	3,294
Purchase accounting impacts - Linde AG	(1,969)	(1,952)	(714)
Merger-related divestitures	—	16	—
Total operating profit	$ 3,322	$ 2,933	$ 5,247

	2020	2019	2018
Depreciation and Amortization			
Americas	$ 1,196	$ 1,195	$ 860
EMEA	723	749	269
APAC	619	613	271
Engineering	36	35	5
Other	132	143	79
Segment depreciation and amortization	2,706	2,735	1,484
Purchase accounting impacts - Linde AG	1,920	1,940	346
Total depreciation and amortization	$ 4,626	$ 4,675	$ 1,830

	2020	2019	2018
Capital Expenditures and Acquisitions			
Americas	$ 1,425	$ 1,814	$ 1,068
EMEA	670	738	329
APAC	1,214	1,231	372
Engineering	13	79	27
Other	146	45	112
Total Capital Expenditures and Acquisitions	$ 3,468	$ 3,907	$ 1,908

	2020	2019	2018
Sales by Major Country			
United States	$ 8,475	$ 8,604	$ 5,942
Germany	3,740	3,630	868
China	2,061	2,005	1,032
United Kingdom	1,595	1,653	398
Australia	1,071	1,127	183
Brazil	822	994	1,003
Other – International	9,479	10,215	5,410
Total sales	$ 27,243	$ 28,228	$ 14,836

	2020	2019	2018
Long-lived Assets by Major Country (b)			
United States	$ 7,777	$ 7,498	$ 7,189
Germany	2,394	2,429	2,411
China	2,413	2,254	2,237
United Kingdom	1,313	1,479	1,582
Australia	1,105	1,214	1,476
Brazil	734	956	1,012
Other – International	12,976	13,234	13,810
Total long-lived assets	$ 28,711	$ 29,064	$ 29,717

(a) Sales reflect external sales only and include Linde AG sales from the merger date of October 31, 2018 forward. Intersegment sales, primarily from Engineering to the industrial gases segments, were not material.

(b) Long-lived assets include property, plant and equipment - net.

19. REVENUE RECOGNITION

Revenue is accounted for in accordance with ASC 606. Revenue is recognized as control of goods or services are transferred to customers in an amount that reflects the consideration to which an entity expects to be entitled to receive in exchange for the goods or services.

Contracts with Customers

Approximately 83% of Linde's consolidated sales are generated from industrial gases and related products in three geographic segments (Americas, EMEA, and APAC) and the remaining 17% is related primarily to the Engineering segment, and to a lesser extent Other (see Note 18 for operating segment details). Linde serves a diverse group of industries including healthcare, energy, manufacturing, food, beverage carbonation, fiber-optics, steel making, aerospace, chemicals and water treatment.

Industrial Gases

Within each of the company's geographic segments for industrial gases, there are three basic distribution methods: (i) on-site or tonnage; (ii) merchant or bulk liquid; and (iii) packaged or cylinder gases. The distribution method used by Linde to supply a customer is determined by many factors, including the customer's volume requirements and location. The distribution method generally determines the contract terms with the customer and, accordingly, the revenue recognition accounting practices. Linde's primary products in its industrial gases business are atmospheric gases (oxygen, nitrogen, argon, rare gases) and process gases (carbon dioxide, helium, hydrogen, electronic gases, specialty gases, acetylene). These products are generally sold through one of the three distribution methods.

Following is a description of each of the three industrial gases distribution methods and the respective revenue recognition policies:

On-site. Customers that require the largest volumes of product and that have a relatively constant demand pattern are supplied by cryogenic and process gas on-site plants. Linde constructs plants on or adjacent to these customers' sites and supplies the product directly to customers by pipeline. Where there are large concentrations of customers, a single pipeline may be connected to several plants and customers. On-site product supply contracts generally are total requirement contracts with terms typically ranging from 10-20 years and contain minimum purchase requirements and price escalation provisions. Many of the cryogenic on-site plants also produce liquid products for the merchant market. Therefore, plants are typically not dedicated to a single customer. Additionally, Linde is responsible for the design, construction, operations and maintenance of the plants and our customers typically have no involvement in these activities. Advanced air separation processes also allow on-site delivery to customers with smaller volume requirements.

The company's performance obligations related to on-site customers are satisfied over time as customers receive and obtain control of the product. Linde has elected to apply the practical expedient for measuring progress towards the completion of a performance obligation and recognizes revenue as the company has the right to invoice each customer, which generally corresponds with product delivery. Accordingly, revenue is recognized when product is delivered to the customer and the company has the right to invoice the customer in accordance with the contract terms. Consideration in these contracts is generally based on pricing which fluctuates with various price indices. Variable components of consideration exist within on-site contracts but are considered constrained.

Merchant. Merchant deliveries generally are made from Linde's plants by tanker trucks to storage containers at the customer's site. Due to the relatively high distribution cost, merchant oxygen and nitrogen generally have a relatively small distribution radius from the plants at which they are produced. Merchant argon, hydrogen and helium can be shipped much longer distances. The customer agreements used in the merchant business are usually three to seven year supply agreements based on the requirements of the customer. These contracts generally do not contain minimum purchase requirements or volume commitments.

The company's performance obligations related to merchant customers are generally satisfied at a point in time as the customers receive and obtain control of the product. Revenue is recognized when product is delivered to the customer and the company has the right to invoice the customer in accordance with the contract terms. Any variable components of consideration within merchant contracts are constrained however this consideration is not significant.

Packaged Gases. Customers requiring small volumes are supplied products in containers called cylinders, under medium to high pressure. Linde distributes merchant gases from its production plants to company-owned cylinder filling plants where cylinders are then filled for distribution to customers. Cylinders may be delivered to the customer's site or picked up by the customer at a packaging facility or retail store. Linde invoices the customer for the industrial gases and the use of the cylinder container(s). The company also sells hardgoods and welding equipment purchased from independent manufacturers. Packaged gases are generally sold under one to three-year supply contracts and purchase orders and do not contain minimum purchase requirements or volume commitments.

The company's performance obligations related to packaged gases are satisfied at a point in time. Accordingly, revenue is recognized when product is delivered to the customer or when the customer picks up product from a packaged gas facility or retail store, and the company has the right to payment from the customer in accordance with the contract terms. Any variable consideration is constrained and will be recognized when the uncertainty related to the consideration is resolved.

Linde Engineering

The company designs and manufactures equipment for air separation and other industrial gas applications manufactured specifically for end customers. Sale of equipment contracts are generally comprised of a single performance obligation. Revenue from sale of equipment is generally recognized over time as Linde has an enforceable right to payment for performance completed to date and performance does not create an asset with alternative use. For contracts recognized over time, revenue is recognized primarily using a cost incurred input method. Costs incurred to date relative to total estimated costs at completion are used to measure progress toward satisfying performance obligations. Costs incurred include material, labor, and overhead costs and represent work contributing and proportionate to the transfer of control to the customer. Contract modifications are typically accounted for as part of the existing contract and are recognized as a cumulative adjustment for the inception-to-date effect of such change.

Contract Assets and Liabilities

Contract assets and liabilities result from differences in timing of revenue recognition and customer invoicing. Contract assets primarily relate to sale of equipment contracts for which revenue is recognized over time. The balance represents unbilled revenue which occurs when revenue recognized under the measure of progress exceeds amounts invoiced to customers. Customer invoices may be based on the passage of time, the achievement of certain contractual milestones or a combination of both criteria. Contract liabilities include advance payments or right to consideration prior to performance under the contract. Contract liabilities are recognized as revenue as performance obligations are satisfied under contract terms. Linde has contract assets of $162 million at December 31, 2020 and $368 million at December 31, 2019. Total contract liabilities are $2,301 million at December 31, 2020 (current of $1,769 million and $532 million within other long-term liabilities in the consolidated balance sheets). Total contract liabilities were $2,106 million at December 31, 2019 (current contract liabilities of $1,758 million and $348 million within other long-term liabilities in the consolidated balance sheets). Revenue recognized for the twelve months ended December 31, 2020 that was included in the contract liability at December 31, 2019 was $1,283 million. Contract assets and liabilities primarily relate to the Linde Engineering business acquired in the merger. The industrial gases business does not typically have material contract assets or liabilities.

Payment Terms and Other

Linde generally receives payment after performance obligations are satisfied, and customer prepayments are not typical for the industrial gases business. Payment terms vary based on the country where sales originate and local customary payment practices. Linde does not offer extended financing outside of customary payment terms. Amounts billed for sales and use taxes, value-added taxes, and certain excise and other specific transactional taxes imposed on revenue producing transactions are presented on a net basis and are not included in sales within the consolidated statement of income. Additionally, sales returns and allowances are not a normal practice in the industry and are not significant.

Disaggregated Revenue Information

As described above and in Note 18, the company manages its industrial gases business on a geographic basis, while the Engineering and Other businesses are generally managed on a global basis. Furthermore, the company believes that reporting sales by distribution method by reportable geographic segment best illustrates the nature, timing, type of customer, and contract terms for its revenues, including terms and pricing.

The following tables show sales by distribution method at the consolidated level and for each reportable segment and Other for the years ended December 31, 2020, 2019 and 2018. The years ended December 31, 2020 and 2019 reflect the results of the combined business for the entire year. The year ended December 31, 2018 reflects the results of Praxair for the entire year and the results of Linde AG for the period beginning after October 31, 2018 (the merger date).

(Millions of dollars)	Year Ended December 31, 2020						
Sales	**Americas**	**EMEA**	**APAC**	**Engineering**	**Other**	**Total**	**%**
Merchant	$ 2,839	$ 1,870	$ 2,005	$ —	$ 145	$ 6,859	25 %
On-Site	2,513	1,354	2,049	—	—	5,916	22 %
Packaged Gas	5,034	3,175	1,559	—	22	9,790	36 %
Other	73	50	74	2,851	1,630	4,678	17 %
	$ 10,459	$ 6,449	$ 5,687	$ 2,851	$ 1,797	$ 27,243	100 %

(Millions of dollars)	Year Ended December 31, 2019						
Sales	**Americas**	**EMEA**	**APAC**	**Engineering**	**Other (a)**	**Total**	**%**
Merchant	$ 2,945	$ 1,856	$ 2,080	$ —	$ 184	$ 7,065	25 %
On-Site	2,757	1,434	2,020	—	—	6,211	22 %
Packaged Gas	5,183	3,347	1,542	—	19	10,091	36 %
Other	104	6	137	2,799	1,815	4,861	17 %
	$ 10,989	$ 6,643	$ 5,779	$ 2,799	$ 2,018	$ 28,228	100 %

(Millions of dollars)	Year Ended December 31, 2018						
Sales	**Americas**	**EMEA**	**APAC**	**Engineering**	**Other**	**Total**	**%**
Merchant	$ 2,775	$ 832	$ 826	$ —	$ 119	$ 4,552	31 %
On-Site	2,405	536	1,156	—	—	4,097	28 %
Packaged Gas	2,800	1,271	443	—	3	4,517	30 %
Other	37	5	21	459	1,148	1,670	11 %
	$ 8,017	$ 2,644	$ 2,446	$ 459	$ 1,270	$ 14,836	100 %

(a) Other/Other includes $65 million for the year ended December 31, 2019 of merger-related divestitures that have been excluded from segment sales.

Remaining Performance Obligations

As described above, Linde's contracts with on-site customers are under long-term supply arrangements which generally require the customer to purchase their requirements from Linde and also have minimum purchase requirements. The company estimates the consideration related to minimum purchase requirements is approximately $46 billion. This amount excludes all sales above minimum purchase requirements, which can be significant depending on customer needs. In the future, actual amounts will be different due to impacts from several factors, many of which are beyond the company’s control including, but not limited to, timing of newly signed, terminated and renewed contracts, inflationary price escalations, currency exchange rates, and pass-through costs related to natural gas and electricity. The actual duration of long-term supply contracts ranges up to twenty years. The company estimates that approximately half of the revenue related to minimum purchase requirements will be earned in the next five years and the remaining thereafter.

NOTE 20. SUBSEQUENT EVENTS

Effective January 1, 2021, Linde deconsolidated a joint venture with operations in Taiwan, due to the expiration of certain contractual rights that the parties mutually agreed not to renew. The joint venture contributed sales of approximately $600 million in 2020. From the effective date, the joint venture will be reflected as an equity investment on Linde's consolidated balance sheet with the corresponding results reflected in income from equity investments on the consolidated statement of income. The deconsolidation will not have an impact on earnings per share as the ownership percent remains the same.

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

None.

ITEM 9A. CONTROLS AND PROCEDURES

Conclusion Regarding the Effectiveness of Disclosure Controls and Procedures

Based on an evaluation of the effectiveness of Linde’s disclosure controls and procedures, which was made under the supervision and with the participation of management, including Linde’s principal executive officer and principal financial officer, the principal executive officer and principal financial officer have each concluded that, as of December 31, 2020, such disclosure controls and procedures are effective in ensuring that information required to be disclosed by Linde in reports that it files or submits under the Exchange Act of 1934 is recorded, processed, summarized and reported within the time periods specified in the Securities and Exchange Commission’s rules and forms, and accumulated and communicated to management including Linde’s principal executive officer and principal financial officer, to allow timely decisions regarding required disclosure.

Management’s Report on Internal Control Over Financial Reporting

Refer to Item 8 for Management’s Report on Internal Control Over Financial Reporting as of December 31, 2020.

Changes in Internal Control over Financial Reporting

There were no changes in Linde’s internal control over financial reporting that occurred during the quarter ended December 31, 2020 that have materially affected, or are reasonably likely to materially affect, Linde’s internal control over financial reporting.

ITEM 9B. OTHER INFORMATION

None.

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

Certain information required by this item is incorporated herein by reference to the sections captioned “Corporate Governance and Board Matters - Director Nominees" and “Corporate Governance And Board Matters - "Delinquent Section 16 (a) Reports" in Linde’s Proxy Statement to be filed by April 30, 2021 for the Annual General Meeting.

Identification of the Audit Committee

Linde has a separately-designated standing Audit Committee established in accordance with Section 3(a)(58)(A) of the Securities Exchange Act of 1934 as amended (the “Exchange Act”). The members of that audit committee are Prof. Dr. Clemens Börsig (chairman), Dr. Nance K. Dicciani, Dr. Thomas Enders, Edward G. Galante, Larry D. McVay and Dr. Victoria Ossadnik, and each member is independent within the meaning of the independence standards adopted by the Board of Directors and those of the New York Stock Exchange.

Audit Committee Financial Expert

The Linde Board of Directors has determined that Prof. Dr. Clemens Börsig is an “audit committee financial expert” as defined by Item 407(d)(5)(ii) of Regulation S-K of the Exchange Act and is independent within the meaning of the independence standards adopted by the Board of Directors and those of the New York Stock Exchange.

Code of Ethics

Linde has adopted a code of ethics that applies to the company’s directors and all employees, including its Chief Executive Officer, Chief Financial Officer, and Chief Accounting Officer. This code of ethics, including specific standards for implementing certain provisions of the code, has been approved by the Linde Board of Directors and is named the “Code of Business Integrity”. This document is posted on the company’s public website, www.linde.com but is not incorporated herein.

ITEM 11. EXECUTIVE COMPENSATION

Information required by this item is incorporated herein by reference to the sections captioned “Executive Compensation Matters” and “Corporate Governance and Board Matters - Director Compensation” in Linde’s Proxy Statement to be filed by April 30, 2021 for the Annual General Meeting.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

Equity Compensation Plans Information - The table below provides information as of December 31, 2020 about company shares that may be issued upon the exercise of options, warrants and rights granted to employees or members of Linde's Board of Directors under equity compensation plans that were assumed by Linde upon the completion of the business combination on October 31, 2018.

EQUITY COMPENSATION PLANS TABLE

Plan Category	Number of securities to be issued upon exercise of outstanding options, warrants and rights (a)	Weighted-average exercise price of outstanding options, warrants and rights (b)	Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in column (a)) (c)
Equity compensation plans approved by shareholders	9,192,326 (1)	$ 136.05	5,394,996 (2)
Equity compensation plans not approved by shareholders	—	—	—
Total	9,192,326	$ 136.05	5,394,996

(1) This amount includes 688,170 restricted shares and 437,110 performance shares.

(2) This amount includes 5,117,443 shares available for future issuance pursuant to the Amended and Restated 2009 Linde Long Term Incentive Plan assumed by Linde, and 277,553 shares available for future issuance pursuant to the Long Term Incentive Plan 2018 of Linde plc.

Certain information required by this item regarding the beneficial ownership of the company's ordinary shares is incorporated herein by reference to the section captioned "Information on Share Ownership" in Linde's Proxy Statement to be filed by April 30, 2021 for the Annual General Meeting.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS AND DIRECTOR INDEPENDENCE

Information required by this item is incorporated herein by reference to the sections captioned "Corporate Governance And Board Matters – Review, Approval or Ratification of Transactions with Related Persons," "Corporate Governance And Board Matters – Certain Relationships and Transactions," and "Corporate Governance And Board Matters – Director Independence" in Linde's Proxy Statement to be filed by April 30, 2021 for the Annual General Meeting.

ITEM 14. PRINCIPAL ACCOUNTING FEES AND SERVICES

Information required by this item is incorporated herein by reference to the section captioned "Audit Matters" in Linde's Proxy Statement to be filed by April 30, 2021 for the Annual General Meeting.

PART IV

ITEM 15. EXHIBITS, FINANCIAL STATEMENT SCHEDULES

(a) The following documents are filed as part of this report:

(i) The company's 2020 Consolidated Financial Statements and the Report of the Independent Registered Public Accounting Firm are included in Part II, Item 8. Financial Statements and Supplementary Data.

(ii) Financial Statement Schedules – All financial statement schedules have been omitted because they are not applicable or the required information is shown in the financial statements or notes thereto.

(iii) Exhibits – The exhibits filed as part of this Annual Report on Form 10-K are listed in the accompanying index.

INDEX TO EXHIBITS

Linde plc and Subsidiaries

Exhibit No.	Description
2.1	Business Combination Agreement by and among Linde Aktiengesellschaft, Praxair, Inc., Zamalight PLC, Zamalight Holdco LLC and Zamalight Subco, Inc. dated as of June 1, 2017 (Filed as Exhibit 2.1 to Praxair, Inc.'s Current Report on Form 8-K dated June 1, 2017, Filing No. 1-11037, and is incorporated herein by reference.)
2.1a	Amendment No. 1, dated August 10, 2017, to the Business Combination Agreement, by and among Praxair, Inc., Linde Aktiengesellschaft, Linde plc, Zamalight Holdco LLC and Zamalight Subco, Inc. (Filed as Exhibit 2.1 to Praxair, Inc.'s Current Report on Form 8-K dated August 10, 2017, Filing No. 1-11037, and is incorporated hereby by reference.)
**2.2	Sale and Purchase Agreement, dated July 5, 2018, by and among Praxair, Inc., Taiyo Nippon Sanso Corporation (“Taiyo”), and Linde plc with respect to the sale of a majority of Praxair’s businesses in Europe to Taiyo in connection with the Business Combination Agreement (Filed as Exhibit 2.1 to the Company’s Quarterly Report on Form 10-Q for the quarter ended September 30, 2018, File No. 1-38730, and is incorporated hereby by reference).
**2.3	Sale and Purchase Agreement, dated July 16, 2018, by and among Linde AG, Praxair, Inc., MG Industries GmbH, Messer Canada Inc., MG Industries USA, Inc. (the MG entities and Messer Canada, Inc. being collectively referred to as “Messer”), and Linde plc with respect to the sale of certain assets of Linde AG in the Americas and certain assets of Praxair, Inc. to Messer in connection with the Business Combination Agreement (Filed as Exhibit 2.2 to the Company’s Quarterly Report on Form 10-Q for the quarter ended September 30, 2018, File No. 1-38730, and is incorporated hereby by reference).
**2.3a	First Amendment dated September 21, 2018 to the Sale and Purchase Agreement, dated July 16, 2018, by and among Linde AG, Praxair, Inc., Messer, and Linde plc with respect to the sale of certain additional assets of Linde AG in the Americas to Messer in connection with the Business Combination Agreement (Filed as Exhibit 2.3 to the Company’s Quarterly Report on Form 10-Q for the quarter ended September 30, 2018, File No. 1-38730, and is incorporated hereby by reference).
**2.3b	Second Amendment dated October 19, 2018 to the Sale and Purchase Agreement, dated July 16, 2018, as amended by the First Amendment thereto, by and among Linde AG, Praxair, Inc., Messer, and Linde plc, with respect to the sale of certain additional assets of Linde AG in the Americas to Messer in connection with the Business Combination Agreement (Filed as Exhibit 2.2 to the Company’s Quarterly Report on Form 10-Q for the quarter ended September 30, 2018, File No. 1-11037, and is incorporated hereby by reference).
**2.3c	Third Amendment dated February 20, 2019 to the Sale and Purchase Agreement, dated July 16, 2018, as amended by the First and Second Amendment thereto, by and among Linde AG, Praxair, Inc., Messer, and Linde plc, with respect to the sale of certain additional assets of Linde AG in the Americas to Messer in connection with the Business Combination Agreement dated as of June 1, 2017, as amended, to effect a combination of the businesses of Linde AG and Praxair, Inc. (Filed as Exhibit 2.4 to the Company’s Current Report on Form 8-K, filed on March 7, 2019, File No. 1-11037, and is incorporated hereby by reference).
3.01	Amended and Restated Public Limited Company Constitution of Linde plc (Filed as Exhibit 3.1 to the Company’s Current Report on Form 8-K, filed on October 31, 2018, File No. 333-218485, and incorporated herein by reference).
4.01	Description of Linde plc Ordinary Shares (Filed as Exhibit 4.01 to Linde plc's 2019 Annual Report on Form 10-K, Filing No. 1-38730, and incorporated herein by reference).
4.02	Indenture, dated as of July 15, 1992, between Praxair, Inc. and U.S. Bank National Association, as the ultimate successor trustee to Bank of America, Illinois, formerly Continental Bank, National Association (Filed as Exhibit 4 to Praxair, Inc.'s Current Report on Form 8-K dated March 19, 2007, Filing No. 1-11037, and incorporated herein by reference).
4.03	Form of Subordinated Indenture for Praxair, Inc. (Filed as Exhibit 4.3 to Praxair, Inc.'s Form S-3, filed on May 12, 2015, File No. 333-204093, and is incorporated herein by reference.)
4.04	Supplemental Indenture, dated as of September 3, 2019, among Linde plc, Praxair, Inc., Linde AG and U.S. Bank National Association, as trustee (Filed as Exhibit 4.2 to the Linde plc Form 8-K dated September 6, 2019, Filing No. 1-38730, and incorporated herein by reference).
4.05	Guarantee and Negative Pledge of Linde plc dated May 11, 2020 (Filed as Exhibit 4.3 to the Linde plc Form 8-K dated May 26, 2020, Filing No.1-38730, and is incorporated herein by reference).
4.06	Upstream Guarantee to Linde plc provided by Linde GmbH dated May 11, 2020 (Filed as Exhibit 4.4 to the Linde plc Form 8-K dated May 26, 2020, Filing No.1-38730, and incorporated herein by reference).
4.07	Upstream Guarantee to Linde plc provided by Praxair, Inc. dated May 11, 2020 (Filed as Exhibit 4.5 to the Linde plc Form 8-K dated May 26, 2020, Filing No.1-38730, and incorporated herein by reference).

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4.08	Fiscal Agency Agreement, dated May 11, 2020, among Linde plc, as Issuer and as Guarantor, Linde Finance B.V., as Issuer, and Deutsche Bank Aktiengesellschaft, as Fiscal Agent and Paying Agent (Filed as Exhibit 4.6 to the Linde plc Form 8-K dated May 26. 2020, Filing No 1-37830, and incorporated herein by reference).
4.09	Indenture, dated as of August 10, 2020, among Praxair, Inc., Linde plc and U.S. Bank National Association, as trustee (Filed as Exhibit 4.1 to the Linde plc Form 8-K dated August 10, 2020, Filing No. 1-38730, and incorporated herein by reference).
4.10	Copies of the agreements related to long-term debt which are not required to be filed as exhibits to this Annual Report on Form 10-K will be furnished to the Securities and Exchange Commission upon request.
10.01	Credit Agreement dated as of March 26, 2019, among Linde plc, certain of its subsidiaries parties thereto as borrowers, the lenders party thereto and Bank of America, N.A., as Administrative Agent (Filed as Exhibit 10.1 to Linde plc's current report on Form 8-K, dated April 3, 2019, Filing No. 1-38730, and incorporated herein by reference).
10.01a	Credit Agreement Additional Guarantor Supplement, dated as of September 3, 2019, by Linde AG, and acknowledged by Bank of America, N.A., as Administrative Agent (Filed as Exhibit 10.2 to the Linde plc Form 8-K dated September 6, 2019, Filing No. 1-38730, and incorporated herein by reference).
*10.02	Long Term Incentive Plan 2018 of Linde plc (Filed as Exhibit 4.4 to the Company's Form S-8, filed on October 31, 2018, File No. 333-228084, and incorporated herein by reference).
*10.03	Linde plc Annual Variable Compensation Plan effective January 1, 2019 (Filed as Exhibit 10.1 to the Company's Current Report on Form 8-K, filed on January 25, 2019, File No. 1-38730, and is incorporated hereby by reference).
*10.04	Praxair, Inc. Supplemental Retirement Income Plan A effective January 1, 2008 (Filed as Exhibit 10.05a to Praxair, Inc.'s 2008 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.04a	First amendment to the Praxair, Inc. Supplemental Retirement Income Plan A effective January 1, 2010 (Filed as Exhibit 10.05b to Praxair, Inc.'s 2009 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.04b	Second Amendment to Praxair, Inc. Supplemental Retirement Income Plan A effective February 28, 2017, (Filed as Exhibit 10.05c to Praxair, Inc.'s 2016 Annual Report on Form 10-K, Filing No. 1-11037, and is incorporated hereby by reference).
*10.04c	Third Amendment to the Praxair, Inc. Supplemental Retirement Income Plan A effective December 1, 2017 (Filed as Exhibit 10.05m to Praxair, Inc.'s 2017 Annual Report on Form 10-K, File No. 1-11037, and is incorporated herein by reference).
*10.04d	Praxair, Inc. Supplemental Retirement Income Plan B amended and restated effective December 31, 2007 (Filed as Exhibit 10.05b to Praxair, Inc.'s 2008 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.04e	First amendment to the Praxair, Inc. Supplemental Retirement Income Plan B effective January 1, 2010 (Filed as Exhibit 10.05d to Praxair, Inc.'s 2009 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.04f	Second Amendment to Praxair, Inc. Supplemental Retirement Income Plan B effective July 1, 2012 (Filed as Exhibit 10.05e to Praxair Inc.'s 2012 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.04g	Third Amendment to Praxair, Inc. Supplemental Retirement Income Plan B effective February 28, 2017, (Filed as Exhibit 10.05g to Praxair, Inc.'s 2016 Annual Report on Form 10-K, Filing No. 1-11037, and is incorporated herein by reference).
*10.04h	Fourth Amendment to the Praxair, Inc. Supplemental Retirement Income Plan B effective December 1, 2017 (Filed as Exhibit 10.05l to Praxair, Inc.'s 2017 Annual Report on Form 10-K, File No. 1-11037, and is incorporated herein by reference).
*10.05	Praxair, Inc. Equalization Benefit Plan amended and restated effective December 31, 2007 (Filed as Exhibit 10.05c to Praxair, Inc.'s 2008 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.05a	First amendment to the Praxair, Inc. Equalization Benefit Plan effective January 1, 2010 (Filed as Exhibit 10.05f to Praxair Inc.'s 2009 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.05b	Second Amendment to the Praxair, Inc. Equalization Benefit Plan effective February 28, 2017,(Filed as Exhibit 10.05j to Praxair, Inc.'s 2016 Annual Report on Form 10-K, Filing No. 1-11037, and is incorporated herein by reference).

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*10.05c	Third Amendment to the Praxair, Inc. Equalization Benefit Plan effective December 1, 2017 (Filed as Exhibit 10.05k to Praxair, Inc.'s 2017 Annual Report on Form 10-K, File No. 1-11037, and is incorporated herein by reference).
*10.05d	Linde Inc. 2018 Equalization Benefit Plan, Amended and Restated effective September 1, 2020 (Filed as Exhibit 10.5 to Linde plc's Quarterly Report on Form 10-Q for the quarter ended September 30, 2020, Filing No. 1-38730, and incorporated herein by reference).
*10.05e	Linde Inc. 2018 Supplemental Retirement Income Plan A, Amended and Restated effective September 1, 2020 (Filed as Exhibit 10.3 to Linde plc's Quarterly Report on Form 10-Q for the quarter ended September 30, 2020, Filing No. 1-38730, and incorporated herein by reference).
*10.05f	Linde Inc. 2018 Supplemental Retirement Income Plan B, Amended and Restated effective September 1, 2020 (Filed as Exhibit 10.4 to Linde plc's Quarterly Report on Form 10-Q for the quarter ended September 30, 2020, Filing No. 1-38730, and incorporated herein by reference).
*10.06	Praxair, Inc. Director's Fees Deferral Plan amended and restated effective January 26, 2010 (Filed as Exhibit 10.06 to Praxair Inc.'s 2009 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.07	Linde Compensation Deferral Program Amended and Restated effective September 1, 2020 (Filed as Exhibit 10.2 to Linde plc's Quarterly Report on Form 10-Q for the quarter ended September 30, 2020. Filing No. 1-38730, and incorporated herein by reference).
*10.08	Service Credit Arrangement for Stephen F. Angel dated May 23, 2007 was filed as Exhibit 10.20 to Praxair, Inc.'s Form 8-K filed on May 24, 2007 and is incorporated herein by reference.
*10.09	Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan (Filed as Exhibit 4.03 to Praxair, Inc.'s Form S-8, filed on October 31, 2018, File No. 333-228084, and incorporated herein by reference).
*10.09a	First Amendment, dated as of April 25, 2017, to the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan (Filed as Exhibit 10.01 to Praxair, Inc.'s Quarterly Report on Form 10-Q for the quarter ended March 31, 2017, Filing No. 1-11037, and is incorporated herein by reference).
*10.09b	Second Amendment dated September 8, 2020 to the Amended and Restated 2009 Praxair, Inc Long Term Incentive Plan (Filed as Exhibit 10.1 to Linde plc's Quarterly Report on Form 10-Q for the quarter ended September 30, 2020, Filing No. 1-38730, and incorporated herein by reference).
*10.09c	Form of Standard Option Award under the 2009 Praxair, Inc. Long Term Incentive Plan (Filed as Exhibit 10.22 to Praxair, Inc.'s 2009 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.09d	Form of Transferable Option Award under the 2009 Praxair, Inc. Long Term Incentive Plan (Filed as Exhibit 10.23 to Praxair, Inc.'s 2009 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.09e	Form of Transferable Option Award under the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan for grants made in 2015-2017 (Filed as Exhibit 10.26 to Praxair, Inc.'s 2014 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.09f	Form of Transferable Option Award under the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan for grants made in 2018 (Filed as Exhibit 10.26a to Praxair, Inc.'s 2017 Annual Report on Form 10-K, File No. 1-11037, and incorporated herein by reference).
*10.09g	Form of Restricted Stock Unit Award under the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan for grants made in 2018 (Filed as Exhibit 10.27a to Praxair, Inc.'s 2017 Annual Report on Form 10-K, File No. 1-11037, and incorporated herein by reference).
*10.09h	Form of Non-Employee Director Restricted Stock Unit Award under the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan for grants made in 2019 and thereafter (Filed as Exhibit 10.10i to Linde plc's 2019 Annual Report on Form 10-K, Filing No. 1-38730, and incorporated herein by reference).
*10.09i	Form of Transferable Option Award under the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan for grants beginning in 2019 (Filed as Exhibit 10.11L to Linde plc's 2018 Annual Report on Form 10-K, Filing No. 1-38730, and incorporated herein by reference).
*10.09j	Form of Restricted Stock Unit Award under the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan for grants beginning in 2019 (Filed as Exhibit 10.11M to Linde plc's 2018 Annual Report on Form 10-K, Filing No. 1-38730, and incorporated herein by reference).
*10.09k	Form of Performance Share Unit Award under the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan for grants beginning in 2019 with Return on Capital performance metrics (Filed as Exhibit 10.11N to Linde plc's 2018 Annual Report on Form 10-K, Filing No. 1-38730, and incorporated herein by reference).

*10.09l	Form of Performance Share Unit Award under the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan for grants beginning in 2019 with Total Shareholder Return performance metrics (Filed as Exhibit 10.11O to Linde plc's 2018 Annual Report on Form 10-K, Filing No. 1-38730, and incorporated herein by reference).
*10.10	Form of Employer-Funded Pension Plan Executive Agreement of Linde AG (Filed as Exhibit 10.14 to Linde plc's 2018 Annual Report on Form 10-K, Filing No. 1-38730, and incorporated herein by reference).
*10.11	Form of Linde AG Executive Employment Agreement (Filed as Exhibit 10.15 to Linde plc's 2018 Annual Report on Form 10-K, Filing No. 1-38730, and incorporated herein by reference).
*10.11a	Form of Change Control Appendix to Linde AG Executive Employment Agreement. (Filed as Exhibit 10.15A to Linde plc's 2018 Annual Report on Form 10-K, Filing No. 1-38730, and incorporated herein by reference).
*10.12	Service Agreement by and between Linde Holding GmbH and Mr. Sanjiv Lamba, dated December 20, 2019 (Filed as Exhibit 10.13 to Linde plc's 2019 Annual Report on Form 10-K, Filing No. 1-38730, and incorporated herein by reference).
*10.12a	Long Term Assignment Contract as Addendum to Service Agreement by and between Linde Holding GmbH and Mr. Sanjiv Lamba, dated December 12, 2020
*10.12b	Pension Agreement among Linde AG, Linde Holding GmbH and Mr. Sanjiv Lamba, dated December 20, 2019 (Filed as Exhibit 10.13a to Linde plc's 2019 Annual Report on Form 10-K, Filing No. 1-38730, and incorporated herein by reference).
*10.13	Form of Linde plc Director Indemnification Agreement (Filed as Exhibit 10.1 to the Company's Current Report on Form 8-K, filed on October 31, 2018, File No. 333-218485, and incorporated herein by reference).
21.01	Subsidiaries of Linde plc
23.01	Consent of Independent Registered Public Accounting Firm.
31.01	Rule 13a-14(a) Certification
31.02	Rule 13a-14(a) Certification
32.01	Section 1350 Certification (such certifications are furnished for the information of the Commission and shall not be deemed incorporated by reference into any filing under the Securities Act or the Exchange Act).
32.02	Section 1350 Certification (such certifications are furnished for the information of the Commission and shall not be deemed incorporated by reference into any filing under the Securities Act or the Exchange Act).
101.INS	XBRL Instance Document: The XBRL Instance Document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document.
101.SCH	XBRL Taxonomy Extension Schema
101.CAL	XBRL Taxonomy Extension Calculation Linkbase
101.LAB	XBRL Taxonomy Extension Label Linkbase
101.PRE	XBRL Taxonomy Extension Presentation Linkbase
101.DEF	XBRL Taxonomy Extension Definition Linkbase

Copies of exhibits incorporated by reference can be obtained from the SEC and are located in SEC File No. 1-11037.

*	Indicates a management contract or compensatory plan or arrangement.
**	Certain schedules or similar attachments have been omitted pursuant to Iter agrees to furnish supplemental copies of any of the omitted schedules or att

ITEM 16. FORM 10-K SUMMARY

None.

SIGNATURES

Linde plc and Subsidiaries

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned thereunto duly authorized.

Linde plc
(Registrant)

Date: March 1, 2021 By: /s/ KELCEY E. HOYT

Kelcey E. Hoyt
Chief Accounting Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the Registrant and in the capacities indicated on March 1, 2021.

/s/ PROF. DR. WOLFGANG REITZLE	/s/ STEPHEN F. ANGEL	/s/ MATTHEW J. WHITE
Wolfgang Reitzle ***Chairman***	**Stephen F. Angel** ***Chief Executive Officer and Director***	**Matthew J. White** ***Chief Financial Officer***
/s/ PROF. DDR. ANN-KRISTIN ACHLIETNER	/s/ DR. CLEMENS BÖRSIG	/s/ DR. NANCE K. DICCIANI
Ann-Kristin Achleitner ***Director***	**Clemens Börsig** ***Director***	**Nance K. Dicciani** ***Director***
/s/ DR. THOMAS ENDERS	/s/ FRANZ FEHRENBACH	/s/ EDWARD G. GALANTE
Thomas Enders ***Director***	**Franz Fehrenbach** ***Director***	**Edward G. Galante** ***Director***
/s/ LARRY D. MCVAY	/s/ DR. VICTORIA OSSADNIK	/s/ PROF. DR. MARTIN H. RICHENHAGEN
Larry D. McVay ***Director***	**Victoria Ossadnik** ***Director***	**Martin Richenhagen** ***Director***
/s/ ROBERT L. WOOD		
Robert L. Wood ***Director***		

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

FORM 10-K

☑ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the fiscal year ended December 31, 2019

OR

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from to

Commission file number 001-38730

LINDE PLC

(Exact name of registrant as specified in its charter)

Ireland	**98-1448883**
(State or other jurisdiction of incorporation)	(I.R.S. Employer Identification No.)

The Priestley Centre

10 Priestley Road,

Surrey Research Park,

Guildford, Surrey GU2 7XY

United Kingdom

(Address of principal executive offices) (Zip Code)

+44 14 83 242200

(Registrant's telephone number, including area code)

Securities registered pursuant to Section 12(b) of the Act:

Title of each class:	Trading Symbol(s)	Name of each exchange on which registered:
Ordinary shares (€0.001 nominal value per share)	**LIN**	**New York Stock Exchange**

Securities registered pursuant to Section 12(g) of the Act: None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☑ No ☐

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes ☐ No ☑

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☑ No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☑ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," " smaller reporting company, " and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer ☑ Accelerated filer ☐ Non- accelerated filer ☐ Smaller reporting company ☐ Emerging growth company ☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act). Yes ☐ No ☑

The aggregate market value of the voting and non-voting common stock held by non-affiliates as of June 30, 2019, was approximately $108 billion (based on the closing sale price of the stock on that date as reported on the New York Stock Exchange).

At January 31, 2020, 532,959,736 ordinary shares of €0.001 nominal value per share of the Registrant were outstanding.

Documents incorporated by reference:

Portions of the Proxy Statement of Linde plc for its 2020 Annual General Meeting of Shareholders, are incorporated in Part III of this report.

LINDE PLC

ANNUAL REPORT ON FORM 10-K
For the fiscal year ended December 31, 2019

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FORWARD-LOOKING STATEMENTS

This document contains “forward-looking statements” within the meaning of the Private Securities Litigation Reform Act of 1995. These forward-looking statements are identified by terms and phrases such as: anticipate, believe, intend, estimate, expect, continue, should, could, may, plan, project, predict, will, potential, forecast, and similar expressions. They are based on management’s reasonable expectations and assumptions as of the date the statements are made but involve risks and uncertainties. These risks and uncertainties include, without limitation: the ability to successfully integrate the Praxair and Linde AG businesses; regulatory or other requirements imposed as a result of the business combination of Praxair and Linde AG that could reduce anticipated benefits of the transaction; the risk that Linde plc may be unable to achieve expected synergies or that it may take longer or be more costly than expected to achieve those synergies; the performance of stock markets generally; developments in worldwide and national economies and other international events and circumstances, including trade conflicts and tariffs; changes in foreign currencies and in interest rates; the cost and availability of electric power, natural gas and other raw materials; the ability to achieve price increases to offset cost increases; catastrophic events including natural disasters, epidemics and acts of war and terrorism; the ability to attract, hire, and retain qualified personnel; the impact of changes in financial accounting standards; the impact of changes in pension plan liabilities; the impact of tax, environmental, healthcare and other legislation and government regulation in jurisdictions in which the company operates, including the impact of the U.S. Tax Cuts and Jobs Act of 2017; the cost and outcomes of investigations, litigation and regulatory proceedings; the impact of potential unusual or non-recurring items; continued timely development and market acceptance of new products and applications; the impact of competitive products and pricing; future financial and operating performance of major customers and industries served; the impact of information technology system failures, network disruptions and breaches in data security; and the effectiveness and speed of integrating new acquisitions into the business. These risks and uncertainties may cause actual future results or circumstances to differ materially from accounting principles generally accepted in the United States of America, International Financial Reporting Standards or adjusted projections, estimates or other forward-looking statements.

Linde plc assumes no obligation to update or provide revisions to any forward-looking statement in response to changing circumstances. The above listed risks and uncertainties are further described in Item 1A (Risk Factors) in this report, which should be reviewed carefully. Please consider Linde plc’s forward-looking statements in light of those risks.

Linde plc and Subsidiaries

PART I

ITEM 1. BUSINESS

General

Linde plc is a public limited company formed under the laws of Ireland with its principal offices in the United Kingdom. Linde plc was formed in 2017 in accordance with the requirements of the business combination agreement, dated June 1, 2017, as amended, between Linde plc, Praxair, Inc. ("Praxair") and Linde Aktiengesellschaft ("Linde AG"). Effective October 31, 2018, the business combination was completed and Linde plc is comprised of the businesses of Praxair and Linde AG (hereinafter the combined group will be referred to as "the company" or "Linde").

The business combination brought together two leading companies in the global industrial gases industry, leveraging the proven strengths of each. Linde believes the merger will combine Linde AG’s long-held expertise in technology with Praxair’s efficient operating model, thus creating a global leader. The company is expected to have strong positions in key geographies and end markets that will create a more diverse and balanced global portfolio.

Linde is the largest industrial gas company worldwide and is a major technological innovator in the industrial gases industry. Its primary products in its industrial gases business are atmospheric gases (oxygen, nitrogen, argon, and rare gases) and process gases (carbon dioxide, helium, hydrogen, electronic gases, specialty gases, and acetylene). The company also designs and builds equipment that produces industrial gases primarily for internal use and offers customers a wide range of gas production and processing services such as olefin plants, natural gas plants, air separation plants, hydrogen and synthesis gas plants and other types of plants.

Linde serves a diverse group of industries including healthcare, petroleum refining, manufacturing, food, beverage carbonation, fiber-optics, steel making, aerospace, chemicals, electronics and water treatment.

In 2018, the company, Praxair and Linde AG entered into various agreements with regulatory authorities to satisfy antitrust requirements to secure approval to consummate the business combination. These agreements required the sale of the majority of Praxair's European industrial gases business (completed on December 3, 2018), the majority of Linde AG's Americas industrial gases business (completed on March 1, 2019), select assets of Linde AG's South Korea industrial gases business (completed April 30, 2019), select assets of Praxair's Indian industrial gases business (completed July 12, 2019), select assets of Linde AG's Indian industrial gases business (completed December 16, 2019) as well as certain divestitures of other Praxair and Linde AG businesses in Asia that are expected to be sold in 2020. As of December 31, 2018 and until the completion of the majority of such divestitures, Linde AG and Praxair were obligated to operate their businesses globally as separate and independent companies, and not coordinate any of their commercial operations. The U.S. Federal Trade Commission's (“FTC”) hold separate order (“HSO”) restrictions were lifted March 1, 2019, concurrent with the sale of the required merger-related divestitures in the United States. See Note 4 to the consolidated financial statements for additional information relating to divestitures.

Praxair was determined to be the accounting acquirer in the business combination. Accordingly, the historical financial statements of Praxair for the periods prior to the business combination are considered to be the historical financial statements of the company. The results of Linde AG are included in Linde's consolidated results from the date of the completion of the business combination forward. During 2018, the company reported its continuing operations in six reporting segments under which it managed its operations, assessed performance, and reported earnings: North America, South America, Asia, Europe, Surface Technologies and Linde AG. Effective with the lifting of the hold separate order on March 1, 2019, new operating segments were established. Linde’s industrial gases operations are managed on a geographic basis, which represents three of the company's new reportable segments - Americas, EMEA (Europe/Middle East/Africa), and APAC (Asia/South Pacific); a fourth reportable segment which represents the company's Engineering business, designs and manufactures equipment for air separation and other industrial gas applications specifically for end customers and is managed on a worldwide basis operating in all geographic segments. Other consists of corporate costs and a few smaller businesses, which individually do not meet the quantitative thresholds for separate presentation.

Linde’s sales were $28,228 million, $14,836 million, and $11,358 million for 2019, 2018, and 2017, respectively. Refer to Item 7, Management's Discussion and Analysis, for a discussion of consolidated sales and Note 20 to the consolidated financial statements for additional information related to Linde’s reportable segments.

Industrial Gases Products and Manufacturing Processes

Atmospheric gases are the highest volume products produced by Linde. Using air as its raw material, Linde produces oxygen, nitrogen and argon through several air separation processes of which cryogenic air separation is the most prevalent. Rare gases, such as krypton, neon and xenon, are also produced through cryogenic air separation. As a pioneer in the industrial gases industry, Linde is a leader in developing a wide range of proprietary and patented applications and supply systems technology. Linde also led the development and commercialization of non-cryogenic air separation technologies for the production of industrial gases. These technologies open important new markets and optimize production capacity for the company by lowering the cost of supplying industrial gases. These technologies include proprietary vacuum pressure swing adsorption (“VPSA”) and membrane separation to produce gaseous oxygen and nitrogen, respectively.

Process gases, including carbon dioxide, hydrogen, carbon monoxide, helium, specialty gases and acetylene are produced by methods other than air separation. Most carbon dioxide is purchased from by-product sources, including chemical plants, refineries and industrial processes or is recovered from carbon dioxide wells. Carbon dioxide is processed in Linde’s plants to produce commercial and food-grade carbon dioxide. Hydrogen and carbon monoxide can be produced by either steam methane reforming or auto-thermal reforming of natural gas or other feed streams such as naphtha. Hydrogen is also produced by purifying by-product sources obtained from the chemical and petrochemical industries. Acetylene is primarily sourced as a chemical by-product, but may also be produced from calcium carbide and water.

Industrial Gases Distribution

There are three basic distribution methods for industrial gases: (i) on-site or tonnage; (ii) merchant or bulk liquid; and (iii) packaged or cylinder gases. These distribution methods are often integrated, with products from all three supply modes coming from the same plant. The method of supply is generally determined by the lowest cost means of meeting the customer’s needs, depending upon factors such as volume requirements, purity, pattern of usage, and the form in which the product is used (as a gas or as a cryogenic liquid).

On-site. Customers that require the largest volumes of product (typically oxygen, nitrogen and hydrogen) and that have a relatively constant demand pattern are supplied by cryogenic and process gas on-site plants. Linde constructs plants on or adjacent to these customers’ sites and supplies the product directly to customers by pipeline. On-site product supply contracts generally are total requirement contracts with terms typically ranging from 10-20 years and containing minimum purchase requirements and price escalation provisions. Many of the cryogenic on-site plants also produce liquid products for the merchant market. Therefore, plants are typically not dedicated to a single customer. Advanced air separation processes allow on-site delivery to customers with smaller volume requirements. Customers using these systems usually enter into requirement contracts with terms typically ranging from ten to twenty years.

Merchant. The merchant business is generally associated with distributable liquid oxygen, nitrogen, argon, carbon dioxide, hydrogen and helium. The deliveries generally are made from Linde’s plants by tanker trucks to storage containers at the customer's site which are owned and maintained by Linde and leased to the customer. Due to distribution cost, merchant oxygen and nitrogen generally have a relatively small distribution radius from the plants at which they are produced. Merchant argon, hydrogen and helium can be shipped much longer distances. The customer agreements used in the merchant business are usually three to seven-year requirement contracts.

Packaged Gases. Customers requiring small volumes are supplied products in metal containers called cylinders, under medium to high pressure. Packaged gases include atmospheric gases, carbon dioxide, hydrogen, helium, acetylene and related products. Linde also produces and distributes in cylinders a wide range of specialty gases and mixtures. Cylinders may be delivered to the customer’s site or picked up by the customer at a packaging facility or retail store. Packaged gases are generally sold under one to three-year supply contracts and through purchase orders.

A substantial amount of the cylinder gases sold in the United States are distributed by independent distributors that buy merchant gases in liquid form and repackage the products in their facilities. Packaged gas distributors, including Linde, also distribute hardgoods and welding equipment purchased from independent manufacturers. Over time, Linde has acquired a number of independent industrial gases and welding products distributors at various locations in the United States and continues to sell merchant gases to other independent distributors. Between its own distribution business, joint ventures and sales to independent distributors, Linde is represented in 48 states, the District of Columbia and Puerto Rico.

Engineering

Linde’s Engineering business has a global presence, with its focus on market segments such as olefin, natural gas, air separation, hydrogen and synthesis gas plants. The company utilizes its own extensive process engineering know-how in the planning, project development and construction of turnkey industrial plants and associated services. Linde plants are used in a wide variety of fields: in the petrochemical and chemical industries, in refineries and fertilizer plants, to recover air gases, to produce hydrogen and synthesis gases, to treat natural gas and to produce noble gases. The Engineering business either supplies plant components and services directly to the customer or to the industrial gas business of Linde which operates the plants on behalf of the customer under a long-term gases supply contract.

Inventories – Linde carries inventories of merchant and cylinder gases, hardgoods and coatings materials to supply products to its customers on a reasonable delivery schedule. On-site plants and pipeline complexes have limited inventory. Inventory obsolescence is not material to Linde’s business.

Customers – Linde is not dependent upon a single customer or a few customers.

International – Linde is a global enterprise with approximately 70% of its 2019 sales outside of the United States. The company also has majority or wholly owned subsidiaries that operate in approximately 45 European, Middle Eastern and African countries (including Germany, France, Sweden, the Republic of South Africa, and the United Kingdom); approximately 20 Asian and South Pacific countries (including China, Taiwan, India and Australia); and approximately 20 countries in North and South America (including Canada, Mexico and Brazil).

The company also has equity method investments operating in Europe, Asia, Africa, the Middle East, and North America.

Linde’s international business is subject to risks customarily encountered in foreign operations, including fluctuations in foreign currency exchange rates, import and export controls, and other economic, political and regulatory policies of local governments. Also, see Item 1A. “Risk Factors” and Item 7A. “Quantitative and Qualitative Disclosures About Market Risk.”

Seasonality – Linde’s business is generally not subject to seasonal fluctuations to any significant extent.

Research and Development – Linde’s research and development is directed toward development of gas processing, separation and liquefaction technologies, improving distribution of industrial gases and the development of new markets and applications for these gases. This results in the development of new advanced air separation, hydrogen, synthesis gas, natural gas, adsorption and chemical process technologies as well as the frequent introduction of new industrial gas applications. Research and development is primarily conducted at Pullach, Germany, Tonawanda, New York, Burr Ridge, Illinois and Shanghai, China.

Patents and Trademarks – Linde owns or licenses a large number of patents that relate to a wide variety of products and processes. Linde’s patents expire at various times over the next 20 years. While these patents and licenses are considered important to its individual businesses, Linde does not consider its business as a whole to be materially dependent upon any one particular patent, or patent license, or family of patents. Linde also owns a large number of trademarks, of which the "Linde" trademark is the most significant.

Raw Materials and Energy Costs – Energy is the single largest cost item in the production and distribution of industrial gases. Most of Linde’s energy requirements are in the form of electricity, natural gas and diesel fuel for distribution. The company mitigates electricity, natural gas, and hydrocarbon price fluctuations contractually through pricing formulas, surcharges, and cost pass–through and tolling arrangements.

The supply of energy has not been a significant issue in the geographic areas where the company conducts business. However, energy availability and price is unpredictable and may pose unforeseen future risks.

For carbon dioxide, carbon monoxide, helium, hydrogen, specialty gases and surface technologies, raw materials are largely purchased from outside sources. Linde has contracts or commitments for, or readily available sources of, most of these raw materials; however, their long-term availability and prices are subject to market conditions.

Competition – Linde participates in highly competitive markets in the industrial gases, engineering and healthcare businesses, which are characterized by a mixture of local, regional and global players, all of which exert competitive pressure on the parties. In locations where Linde has pipeline networks, which enable the company to provide reliable and economic supply of products to larger customers, Linde derives a competitive advantage.

Competitors in the industrial and medical gases industry include global and regional companies such as L’Air Liquide S.A., Air Products and Chemicals, Inc., Messer Group GmbH, Mitsubishi Chemical Holdings Corporation (through Taiyo Nippon Sanso Corporation) as well as an extensive number of small to medium size independent industrial gas companies which compete locally as producers or distributors. In addition, a significant portion of the international gases market relates to customer-owned plants.

Employees and Labor Relations – As of December 31, 2019, Linde had 79,886 employees worldwide. Linde has collective bargaining agreements with unions at numerous locations throughout the world, which expire at various dates. Linde considers relations with its employees to be satisfactory.

Environment – Information required by this item is incorporated herein by reference to the section captioned "Management's Discussion and Analysis – Environmental Matters" in Item 7 of this 10-K.

Available Information – The company makes its periodic and current reports available, free of charge, on or through its website, www.linde.com, as soon as practicable after such material is electronically filed with, or furnished to, the Securities and Exchange Commission ("SEC"). Investors may also access from the company website other investor information such as press releases and presentations. Information on the company's website is not incorporated by reference herein. In addition, the public may read and copy any materials filed with the SEC free of charge at the SEC's website, www.sec.gov, that contains reports, proxy information statements and other information regarding issuers that file electronically.

Executive Officers – The following Executive Officers have been elected by the Board of Directors and serve at the pleasure of the Board. It is expected that the Board will elect officers annually following each annual meeting of shareholders.

Stephen F. Angel, 64, is Chief Executive Officer of Linde. Prior to that, Mr. Angel was Chairman, President and CEO of Praxair, Inc. since 2007. Angel joined Praxair in 2001 as an executive vice president and was named president and chief operating officer in February 2006. Prior to joining Praxair, Angel spent 22 years in a variety of management positions with General Electric. Angel serves on the board of directors of PPG Industries and the U.S.-China Business Council and is a member of The Business Council. Angel received a bachelor of science degree in civil engineering from North Carolina State University and an MBA from Loyola College in Baltimore.

Dr. Christian Bruch, age 49, became an executive officer and a member of the Management Committee of Linde in connection with the business combination in October 2018. He is also the Head of Engineering for Linde and is a member of the Executive Board of Linde AG. Dr. Bruch joined The Linde Group's Gases Division in 2004 as a Business Development Manager for Airgases. In 2006 he became the Head of Tonnage Business Development for air separation projects in Europe, the Middle East and Africa. In 2009 he transferred to the Engineering Division, where he was responsible for the product line Air Separation Plants. In 2013 he was appointed a member of the Board of Directors at the Engineering Division, a position he held until becoming a member of the Executive Board of Linde AG at the beginning of 2015 responsible for the Linde Engineering Division and the Corporate & Support Function Technology & Innovation. Prior to joining The Linde Group, Dr. Bruch worked for the Swiss Institute of Technology in Zürich and for the RWE Group in Essen, Germany.

Kelcey E. Hoyt, age 50, became the Chief Accounting Officer of Linde in connection with the business combination in October 2018. Prior to this, she served as Vice President and Controller of Praxair, Inc. effective August 1, 2016. Prior to becoming Controller, she served as Praxair's Director of Investor Relations since 2010. She joined Praxair in 2002 and served as Director of Corporate Accounting and SEC Reporting through 2008, and later served as Controller for various divisions within Praxair's North American Industrial Gas business. Previously, she had five years of experience in audit at KPMG, LLP.

Sanjiv Lamba age 55, became an executive officer and a member of the Management Committee of Linde in connection with the business combination in October 2018. He is the Head of APAC. Mr. Lamba was appointed a Member of the Executive Board of Linde AG in 2011, responsible for the Asia, Pacific segment of the Gases Division, for Global Gases Businesses Helium & Rare Gases, Electronics as well as Asia Joint Venture Management. Mr. Lamba started his career 1989 with BOC India in Finance where he progressed to become Director of Finance. He was appointed Managing Director for BOC's India's business in 2001. Throughout his years with BOC/Linde, he has worked in a number of geographies including Germany, the UK, Singapore and India where he has held numerous roles across the organization.

Eduardo F. Menezes, age 56, became an executive officer and a member of the Management Committee of Linde in connection with the business combination in October 2018. He is the Head of EMEA. Mr. Menezes previously served as Executive Vice President of Praxair, Inc. since 2012, responsible for Praxair Europe, Praxair Mexico, Praxair South America and Praxair Asia. From 2010 to March 2011, he was a Vice President of Praxair with responsibility for the North American Industrial Gases business and was named senior vice president in 2011. From 2007 to 2010, he was President of Praxair Europe. He served as Managing Director of Praxair's business in Mexico from 2004 to 2007, as Vice President and General Manager for Praxair Distribution, Inc. from 2003 to 2004 and as Vice President, U.S. West Region, for North American Industrial Gases, from 2000 to 2003.

Dr. Andreas Opfermann, 48, became Executive Vice President of Americas and a member of the Management Committee of Linde in November 2019. Prior to this, from 2016-2019, he was the regional business unit leader for Linde's North European region. Dr. Opfermann joined Linde in 2005 initially in Corporate Strategy. He has subsequently served as Head of Innovation Management from 2008 to 2010, Head of Clean Energy and Innovation Management from 2010 to 2014, and Head of Technology and Innovation from 2015 to 2016, responsible for all Linde research and development. Before joining Linde, he held positions at McKinsey & Company.

Anne K. Roby, age 55, became an executive officer and a member of the Management Committee of Linde in connection with the business combination in October 2018. She is the Head of Global Functions. Prior to this, Dr. Roby served as Senior Vice President of Praxair, Inc. since January 1, 2014, responsible for Global Supply Systems, R&D, Global Market Development, Global Operations Excellence, Global Strategic Sales, Global Procurement, Sustainability and Safety, Health and Environment. From 2011to 2013, she served as President of Praxair Asia, responsible for Praxair's industrial gases business in China, India, South Korea and Thailand as well as the electronics market globally. In 2010, Dr. Roby became President of Praxair Electronics, after having served as Vice President, Global Sales, for Praxair from 2009 to 2010. Prior to this, she was Vice President of the Praxair U.S. South Region from 2006 to 2009. Dr. Roby joined Praxair in 1991 as a development associate in the company's R&D organization and was promoted to other positions of increasing responsibility.

Matt J. White, age 47, became an executive officer and a member of the Management Committee of Linde in connection with the business combination in October 2018. He is the Chief Financial Officer for Linde. He previously served as the Senior Vice President and Chief Financial Officer of Praxair, Inc. since January 1, 2014. Prior to this, Mr. White was President of Praxair Canada from 2011-2014. He joined Praxair in 2004 as finance director for the company's largest business unit, North American Industrial Gases. In 2008, he became Vice President and Controller of Praxair, Inc., then was named Vice President and Treasurer in 2010. Before joining Praxair, White was vice president, finance, at Fisher Scientific and before that he held various financial positions, including group controller, at GenTek, a manufacturing and performance chemicals company.

ITEM 1A. RISK FACTORS

Due to the size and geographic reach of the company's operations, a wide range of factors, many of which are outside of the company's control, could materially affect the company's future operations and financial performance. Management believes the following risks may significantly impact the company:

The company may fail to realize the anticipated strategic and financial benefits sought from the business combination.

The company may not realize all of the anticipated benefits of the business combination between Praxair, Inc. and Linde AG, which was completed on October 31, 2018. The success of the business combination will depend on, among other things, the company's ability to combine Praxair, Inc.'s and Linde AG's businesses in a manner that facilitates growth and realizes the anticipated annual synergies and cost reductions without adversely affecting current revenues and investments in future growth. The actual integration will continue to involve complex operational, technological and personnel-related challenges. Difficulties in the integration of the businesses, which may result in significant costs and delays, include:

- managing a significantly larger combined group;
- aligning and executing the strategy of the company;
- integrating and unifying the offerings and services available to customers and coordinating distribution and marketing efforts in geographically separate organizations;
- coordinating corporate and administrative infrastructures and aligning insurance coverage;
- coordinating accounting, reporting, information technology, communications, administration and other systems;
- addressing possible differences in corporate cultures and management philosophies;
- the company being subject to Irish laws and regulations and legal action in Ireland;
- coordinating the compliance program and uniform financial reporting, information technology and other standards, controls, procedures and policies;
- the implementation, ultimate impact and outcome of post-completion reorganization transactions, which may be delayed;
- unforeseen and unexpected liabilities related to the business combination or the combined businesses;
- managing tax costs or inefficiencies associated with integrating operations;
- identifying and eliminating redundant and underperforming functions and assets; and
- effecting actions that may be required in connection with obtaining regulatory approvals.

These and other factors could result in increased costs and diversion of management's time and energy, as well as decreases in the amount of expected revenue and earnings. The integration process and other disruptions resulting from the business combination may also adversely affect the company's relationships with employees, suppliers, customers, distributors, licensors and others with whom Praxair, Inc. and Linde AG have business or other dealings, and difficulties in integrating the businesses could harm the reputation of the company.

If the company is not able to successfully integrate the businesses of Praxair, Inc. and Linde AG in an efficient, cost-effective and timely manner, the anticipated benefits and cost savings of the business combination may not be realized fully, or at all, or may take longer to realize than expected.

Weakening economic conditions in markets in which Linde does business may adversely impact its financial results and/or cash flows.

Linde serves a diverse group of industries across more than 100 countries, which generally leads to financial stability through various business cycles. However, a broad decline in general economic or business conditions in the industries served by its customers could adversely affect the demand for Linde's products and impair the ability of its customers to satisfy their obligations to Linde, resulting in uncollected receivables and/or unanticipated contract terminations or project delays. For example, global political and economic uncertainty could reduce investment activities of Linde's customers, which could adversely affect Linde's business.

In addition, many of Linde's customers are in businesses that are cyclical in nature, such as the chemicals, electronics, metals and energy industries. Downturns in these industries may adversely impact Linde during these cycles. Additionally, such conditions could impact the utilization of Linde's manufacturing capacity which may require it to recognize impairment losses on tangible assets such as property, plant and equipment, as well as intangible assets such as goodwill, customer relationships or intellectual property.

Increases in the cost of energy and raw materials and/or disruption in the supply of these materials could result in lost sales or reduced profitability.

Energy is the single largest cost item in the production and distribution of industrial gases. Most of Linde's energy requirements are in the form of electricity, natural gas and diesel fuel for distribution. Linde attempts to minimize the financial impact of variability in these costs through the management of customer contracts and reducing demand through operational productivity and energy efficiency. Large customer contracts typically have escalation and pass-through clauses to recover energy and feedstock costs. Such attempts may not successfully mitigate cost variability, which could negatively impact Linde's financial condition or results of operations. The supply of energy has not been a significant issue in the geographic areas where Linde conducts business. However, regional energy conditions are unpredictable and may pose future risk.

For carbon dioxide, carbon monoxide, helium, hydrogen, specialty gases and surface technologies, raw materials are largely purchased from outside sources. Where feasible, Linde sources several of these raw materials, including carbon dioxide, hydrogen and calcium carbide, as chemical or industrial byproducts. In addition, Linde has contracts or commitments for, or readily available sources of, most of these raw materials; however, their long-term availability and prices are subject to market conditions. A disruption in supply of such raw materials could impact Linde's ability to meet contractual supply commitments.

Linde's international operations are subject to the risks of doing business abroad and international events and circumstances may adversely impact its business, financial condition or results of operations.

Linde has substantial international operations which are subject to risks including devaluations in currency exchange rates, transportation delays and interruptions, political and economic instability and disruptions, restrictions on the transfer of funds, trade conflicts and the imposition of duties and tariffs, import and export controls, changes in governmental policies, labor unrest, possible nationalization and/or expropriation of assets, domestic and international tax laws and compliance with governmental regulations. These events could have an adverse effect on the international operations of Linde in the future by reducing the demand for its products, decreasing the prices at which it can sell its products, reducing the revenue from international operations or otherwise having an adverse effect on its business. For example, Linde has a meaningful presence in the U.K. and the U.K.'s ongoing exit process from the EU has continued to cause, and may in the future cause, political and economic uncertainty, which could have an adverse impact on the markets which Linde supplies.

Currency exchange rate fluctuations and other related risks may adversely affect Linde's results.

Because a significant portion of Linde's revenue is denominated in currencies other than its reporting currency, the U.S. dollar, changes in exchange rates will produce fluctuations in revenue, costs and earnings and may also affect the book value of assets and liabilities and related equity. Although the company from time to time utilizes foreign exchange forward contracts to hedge these exposures, its efforts to minimize currency exposure through such hedging transactions may not be successful depending on market and business conditions. As a result, fluctuations in foreign currency exchange rates could adversely affect Linde's financial condition, results of operations or cash flows.

Macroeconomic factors may impact Linde's ability to obtain financing or increase the cost of obtaining financing which may adversely impact Linde's financial results and/or cash flows.

Volatility and disruption in the U.S., European and global credit and equity markets, from time to time, could make it more difficult for Linde to obtain financing for its operations and/or could increase the cost of obtaining financing. In addition, Linde's borrowing costs can be affected by short- and long-term debt ratings assigned by independent rating agencies which are based, in significant part, on its performance as measured by certain criteria such as interest coverage and leverage ratios. A decrease in these debt ratings could increase the cost of borrowing or make it more difficult to obtain financing.

An impairment of goodwill or intangible assets could negatively impact the company's financial results.

As of December 31, 2019, the net carrying value of goodwill and other indefinite-lived intangible assets was $27 billion and $2 billion, respectively, primarily as a result of the business combination and the related acquisition method of accounting applied to Linde AG. In accordance with generally accepted accounting principles, the company periodically assesses these assets to determine if they are impaired. Significant negative industry or economic trends, disruptions to business, unexpected significant changes or planned changes in use of the assets, divestitures and sustained market capitalization declines may result in recognition of impairments to goodwill or other indefinite-lived assets. Any charges relating to such impairments could have a material adverse impact on Linde's results of operations in the periods recognized.

Catastrophic events could disrupt the operations of Linde and/or its customers and suppliers and may have a significant adverse impact on the results of operations.

The occurrence of catastrophic events or natural disasters such as extreme weather, including hurricanes and floods; health epidemics; and acts of war or terrorism, could disrupt or delay Linde's ability to produce and distribute its products to customers and could potentially expose Linde to third-party liability claims. In addition, such events could impact Linde's customers and suppliers resulting in temporary or long-term outages and/or the limitation of supply of energy and other raw materials used in normal business operations. Linde evaluates the direct and indirect business risks, consults with vendors, insurance providers and industry experts, makes investments in suitably resilient design and technology, and conducts regular reviews of the business risks with management. Despite these steps, however, these situations are outside Linde's control and may have a significant adverse impact on its financial results.

The inability to attract and retain qualified personnel may adversely impact Linde's business.

If Linde fails to attract, hire and retain qualified personnel, it may not be able to develop, market or sell its products or successfully manage its business. Linde is dependent upon a highly skilled, experienced and efficient workforce to be successful. Much of Linde's competitive advantage is based on the expertise and experience of key personnel regarding marketing, technology, manufacturing and distribution infrastructure, systems and products. The inability to attract and hire qualified individuals or the loss of key employees in very skilled areas could have a negative effect on Linde's financial results.

If Linde fails to keep pace with technological advances in the industry or if new technology initiatives do not become commercially accepted, customers may not continue to buy Linde's products and results of operations could be adversely affected.

Linde's research and development is directed toward developing new and improved methods for the production and distribution of industrial gases, the design and construction of plants and toward developing new markets and applications for the use of industrial and process gases. This results in the introduction of new applications and the development of new advanced air separation process technologies. As a result of these efforts, Linde develops new and proprietary technologies and employs necessary measures to protect such technologies within the global geographies in which Linde operates. These technologies help Linde to create a competitive advantage and to provide a platform to grow its business. If Linde's research and development activities do not keep pace with competitors or if Linde does not create new technologies that benefit customers, future results of operations could be adversely affected.

Risks related to pension benefit plans may adversely impact Linde's results of operations and cash flows.

Pension benefits represent significant financial obligations that will be ultimately settled in the future with employees who meet eligibility requirements. Because of the uncertainties involved in estimating the timing and amount of future payments and asset returns, significant estimates are required to calculate pension expense and liabilities related to Linde's plans. Linde utilizes the services of independent actuaries, whose models are used to facilitate these calculations. Several key assumptions are used in the actuarial models to calculate pension expense and liability amounts recorded in the consolidated financial statements. In particular, significant changes in actual investment returns on pension assets, discount rates, or legislative or regulatory changes could impact future results of operations and required pension contributions.

Operational risks may adversely impact Linde's business or results of operations.

Linde's operating results are dependent on the continued operation of its production facilities and its ability to meet customer contract requirements and other needs. Insufficient or excess capacity threatens Linde's ability to generate competitive profit margins and may expose Linde to liabilities related to contract commitments. Operating results are also dependent on Linde's ability to complete new construction projects on time, on budget and in accordance with performance requirements. Failure to do so may expose Linde's business to loss of revenue, potential litigation and loss of business reputation.

Also inherent in the management of Linde's production facilities and delivery systems, including storage, vehicle transportation and pipelines, are operational risks that require continuous training, oversight and control. Material operating failures at production, storage facilities or pipelines, including fire, toxic release and explosions, or the occurrence of vehicle transportation accidents could result in loss of life, damage to the environment, loss of production and/or extensive property damage, all of which may negatively impact Linde's financial results.

Linde may be subject to information technology system failures, network disruptions and breaches in data security.

Linde relies on information technology systems and networks for business and operational activities, and also stores and processes sensitive business and proprietary information in these systems and networks. These systems are susceptible to outages due to fire, flood, power loss, telecommunications failures, viruses, break-ins and similar events, or breaches of security.

Linde has taken steps to address these risks and concerns by implementing advanced security technologies, internal controls, network and data center resiliency and recovery process. Despite these steps, however, operational failures and breaches of security from increasingly sophisticated cyber threats could lead to the loss or disclosure of confidential information, result in business interruption or malfunction or regulatory actions and have a material adverse impact on Linde's operations, reputation and financial results.

The inability to effectively integrate acquisitions or collaborate with joint venture partners could adversely impact Linde's financial position and results of operations.

In addition to the business combination, Linde has evaluated and expects to continue to evaluate, a wide array of potential strategic acquisitions and joint ventures. Many of these transactions, if consummated, could be material to its financial condition and results of operations. In addition, the process of integrating an acquired company, business or group of assets may create unforeseen operating difficulties and expenditures. Although historically Linde has been successful with its acquisition strategy and execution, the areas where Linde may face risks include:

- the need to implement or remediate controls, procedures and policies appropriate for a larger public company at companies that prior to the acquisition lacked these controls, procedures and policies;
- diversion of management time and focus from operating existing business to acquisition integration challenges;
- cultural challenges associated with integrating employees from the acquired company into the existing organization;
- the need to integrate each company's accounting, management information, human resources and other administrative systems to permit effective management;
- difficulty with the assimilation of acquired operations and products;
- failure to achieve targeted synergies and cost reductions; and
- inability to retain key employees and business relationships of acquired companies.

Foreign acquisitions and joint ventures involve unique risks in addition to those mentioned herein, including those related to integration of operations across different cultures and languages, currency risks and the particular economic, political and regulatory risks associated with specific countries.

Also, the anticipated benefit of potential future acquisitions may not materialize. Future acquisitions or dispositions could result in the incurrence of debt, contingent liabilities or amortization expenses, or impairments of goodwill, any of which could adversely impact Linde’s financial results.

Linde is subject to a variety of international laws and government regulations and changes in, or failure to comply with, these laws or regulations could have an adverse impact on the company's business, financial position and results of operations.

Linde is subject to regulations in the following areas, among others:

- environmental protection, including climate change and energy efficiency laws and policies;
- domestic and international tax laws and currency controls;
- safety;
- securities laws applicable in the United States, the European Union, Germany, Ireland, and other jurisdictions;
- trade and import/export restrictions, as well as economic sanctions laws;
- antitrust matters;
- data protection;
- global anti-bribery laws, including the U.S. Foreign Corrupt Practices Act; and
- healthcare regulations.

Changes in these or other regulatory areas, such as evolving environmental legislation in China, may impact Linde's profitability and may give rise to new or increased compliance risks: it may become more complex and costly to ensure compliance, and the level of sanctions in the event of non-compliance may rise. Such changes may also restrict Linde's ability to compete effectively in the marketplace. Noncompliance with such laws and regulations could result in penalties or sanctions, cancellation of marketing rights or restrictions on participation in, or even exclusion from, public tender proceedings, all of which could have a material adverse impact on Linde's financial results and/or reputation.

Doing business globally requires Linde to comply with anti-corruption, trade, compliance and economic sanctions and similar laws, and to implement policies and procedures designed to ensure that its employees and other intermediaries comply with the applicable restrictions. These restrictions include prohibitions on the sale or supply of certain products, services and any other economic resources to embargoed or sanctioned countries, governments, persons and entities. Compliance with these restrictions requires, among other things, screening of business partners. Despite its commitment to legal compliance and corporate ethics, the company cannot ensure that its policies and procedures will always protect it from intentional, reckless or negligent acts committed by employees or agents under the applicable laws. If Linde fails to comply with laws governing the conduct of international operations, Linde may be subject to criminal and civil penalties and other remedial measures, which could materially adversely affect its reputation, business and results of operations.

The outcome of litigation or governmental investigations may adversely impact the company's business or results of operations.

Linde's subsidiaries are party to various lawsuits and governmental investigations arising in the ordinary course of business. Adverse outcomes in some or all of the claims pending may result in significant monetary damages or injunctive relief that could adversely affect Linde's ability to conduct business. Linde and its subsidiaries may in the future become subject to further claims and litigation, which is impossible to predict. The litigation and other claims Linde faces are subject to inherent uncertainties. Legal or regulatory judgments or agreed settlements might give rise to expenses which are not covered, or are not fully covered, by insurance benefits and may also lead to negative publicity and reputational damage. An unfavorable outcome or determination could cause a material adverse impact on the company's results of operations.

Potential product defects or inadequate customer care may adversely impact Linde's business or results of operations.

Risks associated with products and services may result in potential liability claims, the loss of customers or damage to Linde's reputation. Principal possible causes of risks associated with products and services are product defects or an inadequate level of customer care when Linde is providing services.

Linde is exposed to legal risks relating to product liability in the countries where it operates, including countries such as the United States, where legal risks (in particular through class actions) have historically been more significant than in other countries. The outcome of any pending or future products and services proceedings or investigations cannot be predicted and legal or regulatory judgments or agreed settlements may give rise to significant losses, costs and expenses.

The manufacturing and sale of products as well as the construction of plants by Linde may give rise to risks associated with the production, filling, storage, handling and transport of raw materials, goods or waste. Industrial gases are potentially hazardous substances and medical gases and the related healthcare services must comply with the relevant specifications in order to not adversely affect the health of patients treated with them.

Linde's products and services, if defective or not handled or performed appropriately, may lead to personal injuries, business interruptions, environmental damages or other significant damages, which may result, among other consequences, in liability, losses, monetary penalties or compensation payments, environmental clean-up costs or other costs and expenses, exclusion from certain market sectors deemed important for future development of the business and loss of reputation. All these consequences could have a material adverse effect on Linde's business and results of operations.

U.S. civil liabilities may not be enforceable against Linde.

Linde is organized under the laws of Ireland and substantial portions of its assets will be located outside of the United States. In addition, certain directors and officers of Linde and its subsidiaries reside outside the United States. As a result, it may be difficult for investors to effect service of process within the United States upon Linde or such persons, or to enforce outside the United States judgments obtained against such persons in U.S. courts in any action, including actions predicated upon the civil liability provisions of the U.S. federal securities laws. In addition, it may be difficult for investors to enforce, in original actions brought in courts in jurisdictions located outside the United States, rights predicated upon the U.S. federal securities laws.

A judgment for the payment of money rendered by a court in the United States based on civil liability would not be automatically enforceable in Ireland. There is no treaty between Ireland and the United States providing for the reciprocal enforcement of foreign judgments. The following requirements must be met before the foreign judgment will be deemed to be enforceable in Ireland (i) the judgment must be for a definite sum, (ii) the judgment must be final and conclusive; and (iii) the judgment must be provided by a court of competent jurisdiction.

An Irish court will also exercise its right to refuse judgment if the foreign judgment (i) was obtained by fraud; (ii) violated Irish public policy; (iii) is in breach of natural justice; or (iv) if the judgment is irreconcilable with an earlier foreign judgment.

In addition, there is doubt as to whether an Irish court would accept jurisdiction and impose civil liability on Linde or such persons in an original action predicated solely upon the U.S. federal securities laws brought in a court of competent jurisdiction in Ireland against Linde or such member, officer or expert, respectively.

Changes in tax laws or policy could adversely impact the company's financial position or results of operations.

Linde and its subsidiaries are subject to the tax rules and regulations in the U.S., Germany, Ireland, the U.K. and other countries in which they operate. Those tax rules and regulations are subject to change on a prospective or retroactive basis. Under current economic and political conditions, including the U.K.'s ongoing exit process from the EU, tax rates and policies in any jurisdiction, including the U.S., the U.K. and the EU, are subject to significant change. In particular, since Linde is currently treated as U.K. tax resident, any potential changes in the tax rules applying to U.K. tax-resident companies would directly affect Linde.

A change in Linde's tax residency could have a negative effect on the company's future profitability and may trigger taxes on dividends or exit charges. If Linde ceases to be resident in the United Kingdom and becomes resident in another jurisdiction, it may be subject to United Kingdom exit charges, and/or could become liable for additional tax charges in the other jurisdiction. If Linde were to be treated as resident in more than one jurisdiction, it could be subject to duplicative taxation. Furthermore, although Linde is incorporated in Ireland and is not expected to be treated as a domestic corporation for U.S. federal income tax purposes, it is possible that the IRS could disagree with this result or that changes in U.S. federal income tax law could alter this result. If the IRS successfully asserted such a position or the law were to change, significant adverse tax consequences may result for Linde, the company and Linde's shareholders.

When tax rules change, this may result in a higher tax expense and the need to make higher tax payments. In addition, changes in tax legislation may have a significant impact on Linde's and its subsidiaries' tax receivables and tax liabilities as well as on their deferred tax assets and deferred tax liabilities and uncertainty about the tax environment in some regions may restrict their opportunities to enforce their respective rights under the law. Linde also operates in countries with complex tax regulations which could be interpreted in different ways. Interpretations of these regulations or changes in the tax system might have an adverse impact on the tax liabilities, profitability and business operations of

Linde. Linde and its subsidiaries are subject to periodic audits by the tax authorities in various jurisdictions or other review actions by the relevant financial or tax authorities. The ultimate tax outcome may differ from the amounts recorded in Linde’s or its subsidiaries’ financial statements and may materially affect their respective financial results for the period when such determination is made.

ITEM 1B. UNRESOLVED STAFF COMMENTS

Linde has received no written SEC staff comments regarding any of its Exchange Act reports which remain unresolved.

ITEM 2. PROPERTIES

Linde plc's principal executive offices are located in owned office space in Guildford, United Kingdom. Linde also owns principal administrative office space in Danbury, Connecticut and Houston, Texas, United States; Pullach, Germany; and Singapore.

Due to the nature of Linde's industrial gas products, it is generally uneconomical to transport them distances greater than a few hundred miles from the production facility. As a result, Linde operates a significant number of production facilities spread globally throughout a number of geographic regions.

The following is a description of production facilities for Linde by segment. No significant portion of these assets was leased at December 31, 2019. Generally, these facilities are fully utilized and are sufficient to meet the company's manufacturing needs.

Americas

The Americas segment operates production facilities primarily in the U.S., Canada, Mexico and Brazil, approximately 350 of which are mainly cryogenic air separation plants, hydrogen plants and carbon dioxide plants. There are five major pipeline complexes in North America located in northern Indiana, Houston, along the Gulf Coast of Texas, Detroit and Louisiana. Many of the South American plants support one pipeline complex in Southern Brazil. Also located throughout the Americas are noncryogenic air separation plants, packaged gas facilities and other smaller plant facilities.

EMEA

The EMEA segment has production facilities primarily in Italy, Spain, Germany, the Benelux region, the United Kingdom, Scandinavia and Russia which include approximately 230 cryogenic air separation plants and carbon dioxide plants. Also located throughout Europe are noncryogenic air separation plants, packaged gas facilities and other smaller plant facilities.

APAC

The APAC segment has production facilities located primarily in China, Korea, India and Thailand, approximately 230 of which are cryogenic air separation plants and carbon dioxide plants. Also located throughout Asia are noncryogenic air separation plants, hydrogen, packaged gas and other production facilities.

Engineering

The Linde Engineering business designs and constructs turnkey process plants for third-party customers as well as for the Linde gases businesses in many locations worldwide, such as olefin plants, natural gas plants, air separation plants, hydrogen and synthesis gas plants. Plant components are produced in owned factories in Pullach and Tacherting, Germany; Hesinque, France; Oklahoma, United States; and Dalian, China.

ITEM 3. LEGAL PROCEEDINGS

Information required by this item is incorporated herein by reference to the section captioned "Notes to Consolidated Financial Statements – 19. Commitments and Contingencies" in Item 8 of this 10-K.

ITEM 4. MINE SAFETY DISCLOSURES

Not Applicable

PART II

ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

Linde plc shares trade on the New York Stock Exchange ("NYSE") and the Frankfurt Stock Exchange ("FSE") under the ticker symbol "LIN". At December 31, 2019 there were 9,322 shareholders of record.

Purchases of Equity Securities – Certain information regarding purchases made by or on behalf of the company or any affiliated purchaser (as defined in Rule 10b-18(a)(3) under the Securities Exchange Act of 1934, as amended) of its ordinary shares during the three months ended December 31, 2019 is provided below:

Period	Total Number of Shares Purchased *(Thousands)*	Average Price Paid Per Share	Total Number of Shares Purchased as Part of Publicly Announced Program (1) *(Thousands)*	Approximate Dollar Value of Shares that May Yet be Purchased Under the Program (2) *(Millions)*
October 2019	716	$ 191.19	716	$ 4,322
November 2019	1,039	$ 205.74	1,039	$ 4,108
December 2019	1,896	$ 207.31	1,896	$ 3,715
Fourth Quarter 2019	3,651	$ 203.70	3,651	$ 3,715

(1) On January 22, 2019 the company's board of directors approved the repurchase of $6.0 billion of its ordinary shares ("2019 program") which could take place from time to time on the open market (and could include the use of 10b5-1 trading plans), subject to market and business conditions. The 2019 program has a maximum repurchase amount of 15% of outstanding shares and a stated expiration date of February 1, 2021.

(2) As of December 31, 2019, the company repurchased $2.3 billion of its ordinary shares pursuant to the 2019 program, leaving an additional $3.7 billion authorized.

Peer Performance Table – The graph below compares the most recent five-year cumulative returns of the common stock of Praxair, the company's predecessor, through October 31, 2018 and Linde's ordinary shares from October 31, 2018 through December 31, 2019 with those of the Standard & Poor's 500 Index ("SPX") and the S5 Materials Index ("S5MATR") which covers 22 companies, including Linde. The figures assume an initial investment of $100 on December 31, 2014 and that all dividends have been reinvested. chart-a96ca90a08bc5842896.jpg

	2014	**2015**	**2016**	**2017**	**2018**	**2019**
LIN	$100	$79	$90	$119	$120	$164
SPX	$100	$99	$109	$130	$122	$157
S5MATR	$100	$90	$102	$124	$104	$126

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ITEM 6. SELECTED FINANCIAL DATA

FIVE-YEAR FINANCIAL SUMMARY

(Dollar amounts in millions, except per share data)

The year ended December 31, 2019 reflects the results of both Praxair and Linde AG for the entire year. The year ended December 31, 2018 reflects the results of Praxair for the entire year and the results of Linde AG for the period beginning after October 31, 2018 (the merger date), including the impacts of purchase accounting (See Notes 1, 3 and 4 to the consolidated financial statements). The historical periods prior to 2018 reflect the results of Praxair.

Year Ended December 31,	2019(a)	2018(a)	2017(a)	2016(a)	2015(a)
From the Consolidated Statements of Income					
Sales	$ 28,228	$ 14,836	$ 11,358	$ 10,469	$ 10,710
Cost of sales, exclusive of depreciation and amortization	16,644	9,020	6,382	5,790	5,852
Selling, general and administrative	3,457	1,629	1,207	1,145	1,152
Depreciation and amortization	4,675	1,830	1,184	1,122	1,106
Research and development	184	113	93	92	93
Cost reduction programs and other charges	567	309	52	96	165
Net gain on sale of businesses	164	3,294	—	—	—
Other income (expenses) – net	68	18	4	23	28
Operating profit	2,933	5,247	2,444	2,247	2,370
Interest expense – net	38	202	161	190	161
Net pension and OPEB cost (benefit), excluding service cost	(32)	(4)	(4)	9	49
Income from continuing operations before income taxes and equity investments	2,927	5,049	2,287	2,048	2,160
Income taxes on continuing operations	769	817	1,026	551	612
Income from continuing operations before equity investments	2,158	4,232	1,261	1,497	1,548
Income from equity investments	114	56	47	41	43
Income from continuing operations (including noncontrolling interests)	2,272	4,288	1,308	1,538	1,591
Noncontrolling interests from continuing operations	(89)	(15)	(61)	(38)	(44)
Income from continuing operations	$ 2,183	$ 4,273	$ 1,247	$ 1,500	$ 1,547
Per Share Data – Linde plc Shareholders					
Basic earnings per share from continuing operations	$ 4.03	$ 12.93	$ 4.36	$ 5.25	$ 5.39
Diluted earnings per share from continuing operations	$ 4.00	$ 12.79	$ 4.32	$ 5.21	$ 5.35
Cash dividends per share	$ 3.50	$ 3.30	$ 3.15	$ 3.00	$ 2.86
Weighted Average Shares Outstanding (000's) (b)					
Basic shares outstanding	541,094	330,401	286,261	285,677	287,005
Diluted shares outstanding	545,170	334,127	289,114	287,757	289,055
Other Information and Ratios					
Total assets	$ 86,612	$ 93,386	$ 20,436	$ 19,332	$ 18,319
Total debt	$ 13,956	$ 15,296	$ 9,000	$ 9,515	$ 9,231
Cash flow from operations	$ 6,119	$ 3,654	$ 3,041	$ 2,789	$ 2,695
Net cash provided by (used for) investing activities	$ 1,189	$ 5,363	$ (1,314)	$ (1,770)	$ (1,303)
Net cash used for financing activities	$ (8,997)	$ (4,998)	$ (1,656)	$ (659)	$ (1,310)
Capital expenditures	$ 3,682	$ 1,883	$ 1,311	$ 1,465	$ 1,541
Shares outstanding (000's)	534,381	547,242	286,777	284,901	284,879
Number of employees	79,886	80,820	26,461	26,498	26,657

(a) Amounts for 2019 include: (i) charges of $567 million for cost reduction programs and other charges primarily related to the merger and synergies, (ii) pension settlement charges of $97 million related to lump sum benefit payments made from pension plans, (iii) a net gain on sale of businesses of $164 million and (iv) the purchase accounting impacts of the merger of $1,952 million.

Amounts for 2018 include: (i) charges of $309 million for transaction costs and other charges primarily related to the merger, (ii) pension settlement charges of $14 million related to lump sum benefit payments made from pension plans, (iii) income tax benefit, net of $17 million due to U.S. Tax Cuts and Jobs Act and other tax charges, (iv) a net gain on sale of businesses of $3,294 million, (v) bond redemption costs of $26 million, and (vi) the purchase accounting impacts of the merger of $714 million.

Amounts for 2017 include: (i) charges of $52 million for transaction costs related to the merger, (ii) a pension settlement charge of $2 million related to lump sum benefit payments made from an international pension plan, and (iii) income tax charges, net of $394 million due to U.S. Tax Cuts and Jobs Act.

Amounts for 2016 include: (i) a $16 million charge to interest expense related to the redemption of the $325 million 5.20% notes due 2017, (ii) a pre–tax pension settlement charge of $4 million related to lump sum benefit payments made from the U.S. supplemental pension plan, and (iii) pre–tax charges of $96 million primarily related to cost reduction actions.

Amounts for 2015 include: (i) a pre-tax charge of $165 million related to the cost reduction program and other charges; and (ii) a pre-tax charge of $7 million related to a pension settlement.

See Notes 1, 3, 4, 5, 7, 13 and 18 to the consolidated financial statements.

(b) As a result of the merger, share amounts for the year ended December 31, 2018 reflect the weighted averaging effect of Praxair shares outstanding prior to October 31, 2018 and Linde shares outstanding from October 31, 2018 through December 31, 2018.

ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

The following discussion of the company's financial condition and results of operations should be read together with its consolidated financial statements and notes to the consolidated financial statements included in Item 8 of this Form 10-K.

MERGER OF PRAXAIR, INC. AND LINDE AG

Linde plc ("Linde") is a public limited company formed under the laws of Ireland in 2017 in accordance with the requirements of the business combination agreement between Praxair, Inc. ("Praxair") and Linde Aktiengesellschaft ("Linde AG"). On October 31, 2018 Praxair and Linde AG combined their respective businesses through an all-stock transaction, and became subsidiaries of Linde plc (collectively referred to as the "business combination" or "merger"). The business combination of Praxair and Linde AG has been accounted for using the acquisition method of accounting under the provisions of Financial Accounting Standards Board ("FASB") Accounting Standards Codification 805, "Business Combinations," with Praxair representing the accounting acquirer under this guidance. Accordingly, the historical financial statements of Praxair for the periods prior to the merger are considered to be the historical financial statements of Linde. The results of Linde AG are included in Linde's consolidated results from the merger date forward. The Linde shares trade on the New York Stock Exchange and the Frankfurt Stock Exchange under the ticker symbol "LIN". See Notes 1 and 3 to the consolidated financial statements for additional information.

In connection with the business combination, the company, Praxair and Linde AG, entered into various agreements with regulatory authorities to satisfy anti-trust requirements to secure approval to consummate the business combination. These agreements required the sale of the majority of Praxair's European businesses (completed on December 3, 2018), a significant portion of Linde AG's Americas business (completed on March 1, 2019), select assets of Linde AG's South Korean industrial gases business (completed April 30, 2019), select assets of Praxair's Indian industrial gases business (completed July 12, 2019), select assets of Linde AG's Indian industrial gases business (completed December 16, 2019) as well as certain divestitures of other Praxair and Linde AG businesses in Asia that are currently expected to be sold in 2020 (collectively, the "merger-related divestitures"). In the consolidated financial statements included in Item 8, Praxair's merger-related divestitures are included in the results of operations until sold and Linde AG's merger-related divestitures are accounted for as discontinued operations. See Notes 1, 3 and 4 to the consolidated financial statements included in Item 8 for additional information relating to merger-related divestitures.

Additionally, to obtain merger approval in the United States Linde, Praxair and Linde AG entered into an agreement with the U.S. Federal Trade Commission dated October 1, 2018 ("hold separate order" or "HSO"). Under the HSO, the company, Praxair and Linde AG agreed to continue to operate Linde AG and Praxair as independent, ongoing, economically viable, competitive businesses held separate, distinct, and apart from each other's operations; and not coordinate any aspect of their operations until certain divestitures in the United States were completed.

Accordingly, Linde had accounted for Linde AG as a separate segment for 2018 reporting purposes effective with the merger date. Prior to the merger date, the company's Linde AG segment did not exist. Since the FTC hold separate order restrictions were lifted effective March 1, 2019, the company subsequently implemented a new segment structure as follows: Americas; EMEA

(Europe/Middle East/Africa); APAC (Asia/South Pacific) and Engineering. This new management organization structure was implemented during the first quarter 2019 and, accordingly, segment information has been retrospectively recast for all prior periods.

ITEMS AFFECTING COMPARABILITY

Because Praxair and Linde AG combined their respective businesses effective with the merger date of October 31, 2018, the year ended December 31, 2019 reflects the results and cash flows of the combined business, while the year ended December 31, 2018 includes twelve months of Praxair and two months of Linde AG. Due to the size of Linde AG's businesses prior to the merger, the reported results for 2019 and 2018 periods are not comparable. The balance sheets at December 31, 2019 and December 31, 2018 are comparable because both periods reflect the merger.

Pro Forma Income Statement Information

Therefore, to assist with a discussion of the 2019 and 2018 results on a comparable basis, certain supplemental unaudited pro forma income statement information is provided on both a consolidated and segment basis (referred to as "pro forma income statement information" or "pro forma information").

The pro forma information has been prepared on a basis consistent with Article 11 of Regulation S-X, assuming the merger and merger-related divestitures had been consummated on January 1, 2018. In preparing this pro forma information, the historical financial information has been adjusted to give effect to pro forma Adjustments that are (i) directly attributable to the business combination and other transactions presented herein, such as the merger-related divestitures, (ii) factually supportable, and (iii) expected to have a continuing impact on the combined entity's consolidated results. The pro forma information is based on management's assumptions and is presented for illustrative purposes and does not purport to represent what the results of operations would actually have been if the business combination and merger-related divestitures had occurred as of the dates indicated or what the results would be for any future periods. Pro forma information was not developed for the year ended December 31, 2017. Also, the pro forma information does not include the impact of any revenue, cost or other operating synergies that may result from the business combination or any related restructuring costs.

BUSINESS OVERVIEW

With the merger, Linde is the leading industrial gas company worldwide. The company's primary products in its industrial gases business are atmospheric gases (oxygen, nitrogen, argon, rare gases) and process gases (carbon dioxide, helium, hydrogen, electronic gases, specialty gases, acetylene). The company also designs, engineers, and builds equipment that produces industrial gases primarily for internal use; and offers its customers a wide range of gas production and processing services such as olefin plants, natural gas plants, air separation plants, hydrogen and synthesis gas plants and other types of plants.

Linde’s industrial gas operations are managed on a geographical basis and in 2019 83% of sales were generated by Linde's three geographic segments (Americas, EMEA and APAC) and the remaining 17% is related primarily to the Engineering segment, and to a lesser extent Other (see Note 20 to the consolidated financial statements for operating segment details).

Linde serves a diverse group of industries including healthcare, petroleum refining, manufacturing, food, beverage carbonation, fiber-optics, steel making, aerospace, chemicals and water treatment. The diversity of end-markets supports financial stability for Linde in varied business cycles.

Linde generates most of its revenues and earnings in the following twelve geographies where the company has its strongest market positions and where distribution and production operations allow the company to deliver the highest level of service to its customers at the lowest cost.

North and South America ("Americas")	Europe, Middle East and Africa (“EMEA”)	Asia and Pacific (“APAC”)
United States	Germany	China & Taiwan
Brazil	United Kingdom	Australia
Mexico	Eastern Europe	South Korea
Canada		India

The company manufactures and distributes its industrial gas products through networks of thousands of production plants, pipeline complexes, distribution centers and delivery vehicles. Major pipeline complexes are primarily located in the United States. These networks are a competitive advantage, providing the foundation of reliable product supply to the company’s customer base. The majority of Linde’s business is conducted through long-term contracts which provide stability in cash flow and the ability to pass through changes in energy and feedstock costs to customers. The company has growth opportunities in all major geographies and in diverse end-markets such as energy, electronics, chemicals, metals, healthcare, food and beverage, and aerospace.

EXECUTIVE SUMMARY – FINANCIAL RESULTS & OUTLOOK

2019 Year in review

On October 31, 2018 Praxair and Linde AG combined their respective businesses through an all-stock merger transaction, and became subsidiaries of Linde plc. The year ended December 31, 2018 reflects the results of Praxair for the entire year and the results of Linde AG for the period beginning after October 31, 2018.

- Sales of $28,228 million were 90% above 2018 sales of $14,836 million, primarily driven by the merger that contributed 89% to sales, net of divestitures. Underlying sales increased 1% driven by 3% higher pricing across all geographic segments and 1% volume growth, partially offset by unfavorable currency translation and lower cost pass-through.

- Reported operating profit of $2,933 million was 44% below 2018 primarily driven by the net gain on sale of businesses in 2018 partially offset by the impact of the merger, including purchase accounting impacts, in the current year. On an adjusted pro forma basis, operating profit increased $476 million, or 10%, for 2019 versus 2018, as the impacts of higher pricing and volumes were partially offset by unfavorable currency impacts and cost inflation.*

- Income from continuing operations of $2,183 million and diluted earnings per share from continuing operations of $4.00 decreased from $4,273 million and $12.79, respectively in 2018. Adjusted pro forma income from continuing operations of $4,003 million and adjusted pro forma diluted earnings per share from continuing operations of $7.34 were 17% and 19%, respectively above 2018 adjusted pro forma amounts.*

- Cash flow from operations was $6,119 million, or 22% of sales. Capital expenditures were $3,682 million; dividends paid were $1,891 million; net purchases of ordinary shares of $2,586 million; and debt repayments, net were $1,260 million.

* A reconciliation of the adjusted pro forma amounts can be found in the "Supplemental Pro Forma Income Statement Information" and "Non-GAAP Financial Measures" section in this MD&A. See Notes 1, 3, 4, 5, 7, 13 and 18 to the consolidated financial statements.

2020 Outlook

The company's business is to build, own, and operate industrial gas plants in order to supply atmospheric and process gases to customers. As such, Linde believes that its sale of gas project backlog is one indicator of future sales growth. At December 31, 2019, Linde's sale of gas backlog of large projects under construction was $4.4 billion. This represents the total estimated capital cost of large plants under construction. APAC and Americas represent 64 percent and 29 percent of the backlog, respectively, with the remaining backlog in EMEA. These plants will primarily supply customers in the energy, chemical, and electronics end-markets.

The above outlook should be read in conjunction with the section entitled "Forward-Looking Statements."

Linde provides quarterly updates on operating results, material trends that may affect financial performance, and financial guidance via earnings releases and investor teleconferences. These materials are available on the company's website, www.linde.com, but are not incorporated herein.

CONSOLIDATED RESULTS AND OTHER INFORMATION

The following table provides summary information for 2019, 2018 and 2017. The reported amounts are GAAP amounts from the Consolidated Statements of Income. The pro forma and adjusted pro forma amounts are intended to supplement investors' understanding of the company's financial information and are not a substitute for GAAP measures. The year ended December 31, 2018 reflects the results of Praxair for the entire year and the results of Linde AG for the period beginning after October 31, 2018 (the merger date), including the impacts of purchase accounting (See Notes 1, 3 and 4 to the consolidated financial statements). The historical periods prior to 2018 reflect the results of Praxair, Inc:

	Reported Amounts (GAAP)					*Pro Forma Amounts (a)*		
(Millions of dollars, except per share data) **Year Ended December 31,**	**2019**	**2018**	**2017**	**2019 vs. 2018**	**2018 vs. 2017**	**2019**	**2018**	**2019 vs. 2018**
Reported Amounts								
Sales	$ 28,228	$ 14,836	$ 11,358	90 %	31 %	$ 28,163	$ 28,084	— %
Cost of sales, exclusive of depreciation and amortization	$ 16,644	$ 9,020	$ 6,382	85 %	41 %	$ 16,584	$ 16,929	(2)%
As a percent of sales	59.0 %	60.8 %	56.2 %			58.9 %	60.3 %	
Selling, general and administrative	$ 3,457	$ 1,629	$ 1,207	112 %	35 %	$ 3,456	$ 3,635	(5)%
As a percent of sales	12.2 %	11.0 %	10.6 %			12.3 %	12.9 %	
Depreciation and amortization	$ 4,675	$ 1,830	$ 1,184	155 %	55 %	$ 4,675	$ 4,924	(5)%
Cost reduction programs and other charges (b)	$ 567	$ 309	$ 52			$ 377	$ 56	
Net gain on sale of businesses (b)	$ 164	$ 3,294	$ —			$ —	$ —	
Operating Profit	$ 2,933	$ 5,247	$ 2,444	(44)%	115 %	$ 2,955	$ 2,561	15 %
Operating margin	10.4 %	35.4 %	21.5 %			10.5 %	9.1 %	
Interest expense – net	$ 38	$ 202	$ 161	(81)%	25 %	$ 38	$ 379	(90)%
Net pension and OPEB cost (benefit), excluding service cost	$ (32)	$ (4)	$ (4)	700 %	— %	$ (129)	$ (165)	(22)%
Effective tax rate	26.3 %	16.2 %	44.9 %			24.6 %	28.5 %	
Income from equity investments	$ 114	$ 56	$ 47	104 %	19 %	$ 114	$ 52	119 %
Noncontrolling interests from continuing operations	$ (89)	$ (15)	$ (61)		(75)%	$ (89)	$ —	
Income from continuing operations	$ 2,183	$ 4,273	$ 1,247	(49)%	243 %	$ 2,322	$ 1,729	34 %
Diluted earnings per share from continuing operations	$ 4.00	$ 12.79	$ 4.32	(69)%	196 %	$ 4.25	$ 3.11	37 %
Diluted shares outstanding (c)	545,170	334,127	289,114	63 %	16 %	545,170	555,151	(2)%
Number of employees	79,886	80,820	26,461					
						Adjusted Pro forma Amounts (d)		
Operating profit						$ 5,272	$ 4,796	10 %
Operating margin						18.7 %	17.1 %	
Income from continuing operations						$ 4,003	$ 3,433	17 %
Diluted earnings per share from continuing operations						$ 7.34	$ 6.19	19 %
Other Financial Data (d)								
EBITDA and pro forma EBITDA from continuing operations	$ 7,722	$ 7,133	$ 3,675	8 %	94 %	$ 7,744	$ 7,537	3 %
As percent of sales	27.4 %	48.1 %	32.4 %	(43)%	48 %	27.5 %	26.8 %	
Adjusted pro forma EBITDA from continuing operations						$ 8,178	$ 7,603	8 %
As percent of sales						29.0 %	27.1 %	

(a) Pro forma amounts are supplemental to the GAAP presentations and are prepared on a basis consistent with Article 11 of Regulation S-X. See "Supplemental Pro Forma Income Statement Information" and "Non-GAAP Reconciliations" sections of this MD&A.

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(b) See Notes 4 and 5 to the consolidated financial statements.

(c) As a result of the merger, share amounts for the year ended December 31, 2018 reflect the weighted averaging effect of Praxair shares outstanding prior to October 31, 2018 and Linde shares outstanding from October 31, 2018 through December 31, 2018.

(d) Adjusted pro forma amounts and Other Financial Data are non-GAAP performance measures. A reconciliation of reported amounts to adjusted pro forma amounts can be found in the "Supplemental Pro Forma Income Statement Information" and "Non-GAAP Reconciliations" sections of this MD&A.

Results of Operations

The following table provides a summary of changes in consolidated reported and pro forma sales:

	2019 vs. 2018		2018 vs. 2017
	% Change		% Change
	Reported	Pro forma	Reported
Factors Contributing to Changes - Sales			
Volume	1 %	2 %	4 %
Price/Mix	3 %	2 %	2 %
Cost pass-through	(1)%	(1)%	1 %
Currency	(2)%	(4)%	(1)%
Acquisitions/Divestitures	89 %	1 %	25 %
	90 %	— %	31 %

2019 Compared With 2018

Sales

Reported sales increased $13,392 million, or 90% for the year primarily due to the merger, net of related divestitures. On a pro forma basis sales increased $79 million in 2019 compared to 2018.

On a reported basis, sales increased 90% to $28,228 million in 2019 compared to $14,836 million in 2018 primarily due to the merger, net of related divestitures. Volume increased sales by 1% driven by higher volumes largely in the APAC segment, including new project start-ups. Higher pricing across all geographic segments contributed 3% to sales. Currency translation decreased sales by 2% driven by the weakening of the Brazilian real, Canadian dollar and Chinese yuan against the US dollar. Lower cost pass-through, primarily natural gas, decreased sales by 1% with minimal impact on operating profit.

On a pro forma basis, sales were relatively flat with prior year. Volume growth of 2% was largely driven by higher volumes in the Americas and APAC segments, including new project start-ups. Higher pricing across the gases segments contributed 2% to sales. Unfavorable currency translation, primarily driven by the weakening of the Euro, British pound, Chinese yuan and Australian dollar, decreased sales by 4%. Lower cost pass-through, primarily natural gas, decreased sales by 1% with minimal impact on operating profit. Acquisitions, largely in the Americas segment, contributed 1% to sales.

Cost of sales, exclusive of depreciation and amortization

Reported cost of sales, exclusive of depreciation and amortization increased $7,624 million, or 85%, for the year primarily due to the merger, net of related divestitures.

On a pro forma basis, cost of sales, exclusive of depreciation and amortization decreased $345 million or 2% in 2019 as compared to 2018. Pro forma cost of sales, exclusive of depreciation and amortization was 58.9% of sales in the year versus 60.3% of sales for 2018. The decrease as a percentage of sales in the year was due primarily to higher pricing.

Selling, general and administrative expenses

Reported selling, general and administrative ("SG&A") expenses increased $1,828 million, or 112%, in 2019 to $3,457 million primarily due to the merger. On a pro forma basis, SG&A decreased $179 million, or 5%, versus the 2018 period.

On a reported basis, SG&A increased 112% in 2019, primarily due to the merger. SG&A was 12.2% of sales in 2019 versus 11.0% in 2018, primarily due to the merger.

On a pro forma basis, SG&A decreased 5% in 2019 versus 2018. SG&A was 12.3% of sales in 2019 versus 12.9% in 2018. Currency impacts decreased SG&A by approximately $145 million in the 2019 period. Excluding currency impacts, underlying SG&A decreased due to cost reduction actions and productivity improvements which also drove the improvement of SG&A as a percentage of sales in the period.

Depreciation and amortization

Reported depreciation and amortization expense increased $2,845 million, or 155%, versus 2018. The increase is primarily due to the merger, including $1,940 million of purchase accounting impacts related to the depreciation and amortization of the fair value adjustments of fixed assets and intangible assets acquired in the merger.

On a pro forma basis, depreciation and amortization expense decreased $249 million, or 5%, versus 2018. Currency movements decreased depreciation and amortization by approximately $197 million for the year. Excluding currency effects, depreciation and amortization expense decreased approximately $52 million, primarily driven by measurement period adjustments recognized in 2019 (see Note 3 to the consolidated financial statements), partially offset by increases due to large project start-ups.

Cost reduction programs and other charges

Linde recorded cost reduction programs and other charges of $567 million and $309 million for 2019 and 2018, respectively, primarily related to merger and synergy-related costs and an asset impairment in the third quarter 2019 of approximately $73 million related to a joint venture in APAC resulting from an unfavorable arbitration ruling (see Note 5 to the consolidated financial statements).

On an adjusted pro forma basis, these costs have been eliminated in both periods.

Operating profit

Reported operating profit decreased $2,314 million in 2019, or 44%, primarily driven by the net gain on sale of businesses in 2018 partially offset by the impact of the merger, including purchase accounting impacts, in the current year. On an adjusted pro forma basis, operating profit increased $476 million, or 10%, for 2019 versus 2018.

On a reported basis, operating profit decreased $2,314 million, or 44%. 2019 includes Linde AG's operating results for the full year and a gain on merger-related divestitures of $164 million, which was offset by $1,952 million which primarily related to $1,940 million of purchase accounting charges for additional depreciation and amortization, and $567 million in cost reduction program and other charges. 2018 included Linde AG's operating results from October 31, 2018 forward and a gain on merger-related divestitures of $3,294 million, partially offset by purchase accounting impacts of $714 million and $309 million of merger-related charges.

On an adjusted pro forma basis, which excludes the impacts of purchase accounting, cost reduction programs and other charges and net gains from merger-related divestitures, operating profit increased $476 million, or 10%, as the impacts of higher pricing and volumes were partially offset by unfavorable currency impacts and cost inflation. A discussion of operating profit by segment is included in the segment discussion that follows.

Interest expense - net

Reported interest expense – net in 2019 decreased $164 million, or 81%, versus 2018. On an adjusted pro forma basis interest expense decreased $145 million, or 52% in 2019 as compared to 2018.

On a reported basis, interest expense - net decreased $164 million in 2019 and included a decrease of $96 million related to purchase accounting impacts on the fair value of debt acquired in the merger. Excluding this purchase accounting impact, reported interest expense decreased $68 million in the year as interest on debt acquired in the merger was more than offset by higher interest income.

On an adjusted pro forma basis, interest expense - net decreased $145 million in 2019 primarily due to lower debt levels and higher interest income.

Net pension and OPEB cost (benefit), excluding service cost

Reported net pension and OPEB cost (benefit), excluding service cost was a benefit of $32 million in 2019 versus a benefit of $4 million in 2018 and included pension settlement charges of $97 million and a net $8 million curtailment charge (see Note 18 to the consolidated financial statements). Excluding the impact of these charges, the net pension and OPEB benefit, excluding service cost increased $133 million in 2019, primarily due to the impact of pension and OPEB plans acquired in the merger.

On an adjusted pro forma basis, net pension and OPEB (benefit), excluding service cost was a benefit of $129 million in 2019 versus a benefit of $165 million in 2018.

Effective tax rate

The reported effective tax rate ("ETR") for 2019 was 26.3% versus 16.2% in 2018. 2018 included the impact of the sale of Praxair's European industrial gas business (see Note 7 to the consolidated financial statements).

On an adjusted pro forma basis, the ETR for 2019 was 24.0% versus 25.8% in 2018.

Income from equity investments

Reported income from equity investments for 2019 increased $58 million to $114 million largely related to investments in APAC and EMEA. This increase is primarily related to the merger.

On an adjusted pro forma basis, income from equity investments for 2019 increased $55 million to $171 million. The increase is primarily related to increased earnings from equity investments.

Noncontrolling interests from continuing operations

At December 31, 2019, noncontrolling interests from continuing operations consisted primarily of noncontrolling shareholders' investments in APAC (primarily in China) and surface technologies.

Reported noncontrolling interests from continuing operations increased $74 million to $89 million in 2019 from $15 million in 2018, primarily driven by the merger. 2019 noncontrolling interests includes a $33 million impact for an asset impairment charge in the third quarter related to a joint venture in APAC (see Note 5 to the consolidated financial statements).

On an adjusted pro forma basis, noncontrolling interests from continuing operations increased $10 million in 2019 driven by higher income from continuing operations.

Income from continuing operations

Reported income from continuing operations decreased $2,090 million, or 49%, primarily due to the 2018 gain on merger-related divestitures, partially offset by the merger. Other impacts related to interest - net; net pension and OPEB cost (benefit), excluding service cost; income taxes; income from equity investments; and noncontrolling interest largely offset in the aggregate.

On an adjusted pro forma basis, which excludes the impacts of purchase accounting and other non-GAAP adjustments, income from continuing operations increased $570 million, or 17%, in 2019 primarily due to higher adjusted pro forma operating profit, lower adjusted pro forma interest expense-net, lower adjusted ETR, and higher adjusted pro forma income from equity investments.

Diluted earnings per share from continuing operations

Reported diluted earnings per share from continuing operations decreased $8.79, or 69%, in 2019 as compared to 2018, primarily due to lower net income from continuing operations and higher diluted shares outstanding as a result of the merger.

On an adjusted pro forma basis, diluted EPS of $7.34 in 2019 increased 19% versus 2018, primarily due to higher adjusted pro forma income from continuing operations and lower diluted shares outstanding.

Employees

The number of employees at December 31, 2019 was 79,886, a decrease of 934 employees from December 31, 2018 primarily driven by cost reduction actions partially offset by acquisitions.

Other Financial Data

EBITDA increased to $7,722 million in 2019 from $7,133 million in 2018, primarily due to the merger.

Adjusted pro forma EBITDA from continuing operations increased to $8,178 million for 2019 as compared to $7,603 million in 2018 primarily due to higher income from continuing operations versus the prior year period.

See the "Supplemental Pro Forma Income Statement Information" for pro forma amounts and "Non-GAAP Reconciliations" for adjusted pro forma amounts sections below for definitions and reconciliations of these pro forma and adjusted pro forma non-GAAP measures to reported GAAP amounts.

Other Comprehensive Income (Loss)

Other comprehensive loss for the year ended December 31, 2019 of $435 million resulted primarily from a decrease in the funded status of the company's largest retirement programs. Driven by the low discount rate environment,

the other comprehensive loss of $544 million related to the remeasurement of such retirement programs was partially offset by benefits from cumulative translation adjustments. The translation adjustments reflect the impact of translating local currency foreign subsidiary financial statements to U.S. dollars, and are largely driven by the movement of the U.S. dollar against major currencies including the Euro, the Chinese yuan and the British pound. See the "Currency" section of the MD&A for exchange rates used for translation purposes and Note 9 to the consolidated financial statements for a summary of the currency translation adjustment component of accumulated other comprehensive income by segment.

2018 Compared With 2017

Sales increased 31% to $14,836 million in 2018 compared to $11,358 million in 2017 primarily reflecting the merger with Linde AG which contributed 25% to sales, net of divestitures. Underlying sales increased 6% driven by higher volumes and pricing. Volume growth of 4% was driven by higher volumes in North America and Asia, including new project start-ups. Higher overall pricing across all geographic segments contributed 2% to sales. Currency translation impact decreased sales by 1%. Higher cost pass-through, primarily natural gas, increased sales by 1% with minimal impact on operating profit. The divestiture of Praxair's European businesses in December of 2018 decreased sales by 1%.

Selling, general and administrative expenses increased $422 million, or 35%, in 2018 to $1,629 million primarily due to the merger. SG&A was 11.0% of sales in 2018 versus 10.6% in 2017, primarily due to the merger.

Depreciation and amortization expense increased $646 million, or 55%, versus 2017. The increase is primarily due to the merger, including $346 million of purchase accounting impacts related to the fair value of fixed assets and intangible assets acquired in the merger.

Cost reduction programs and other charges were $309 million and $52 million in 2018 and 2017, respectively and are primarily related to the merger. See Note 5 to the consolidated financial statements.

Net gain on the sale of businesses was $3,294 million and related primarily to the divestiture of Praxair's European industrial gases business in connection with the merger. See Note 4 to the consolidated financial statements.

Other income (expenses) – net in 2018 was a $18 million benefit versus a $4 million benefit in 2017 (see Note 9 to the consolidated financial statements for a summary of major components). In North America, 2018 included a $30 million asset impairment charge which was more than offset by $43 million of gains on asset disposals. In Asia, 2018 included a $22 million asset impairment charge, offset by a litigation settlement gain.

Reported operating profit of $5,247 million in 2018 was $2,803 million, or 115% higher than reported operating profit of $2,444 million in 2017. 2018 includes a net gain on sale of businesses of $3,294 million, partially offset by transaction costs and other charges of $309 million, and purchase accounting impacts of $714 million related to the Linde AG merger (see Notes 4, 5 and 3, respectively, to the consolidated financial statements). 2017 included transaction costs of $52 million (see Note 5 to the consolidated financial statements). Excluding the impact of these items, adjusted operating profit of $2,976 million in 2018 was $480 million, or 19%, higher than adjusted operating profit of $2,496 million in 2017 driven primarily by the merger. Higher volumes and price in the geographic segments and surface technologies also contributed to operating profit growth. A discussion of operating profit by segment is included in the segment discussion that follows.

Reported interest expense – net in 2018 increased $41 million, or 25%, versus 2017. 2018 included charges of $26 million relating to the early redemption of notes and a decrease of $21 million related to purchase accounting impacts related to the fair value of debt acquired in the merger (see Notes 13 and 3 to the consolidated financial statements, respectively). Excluding these impacts, adjusted interest expense of $197 million increased $36 million, or 22%, largely attributable to interest on the debt acquired in the merger and lower capitalized interest. See Note 9 to the consolidated financial statements for further information relating to interest expense.

The reported effective tax rate ("ETR") for 2018 was 16.2% versus 44.9% in 2017. The decrease in the ETR for the 2018 period versus the U.S. statutory rate of 21% was primarily due to the impact of the sale of Praxair's European industrial gases business. The increase in the ETR for the 2017 period versus the U.S. statutory rate of 35% was primarily due to the net $394 million charge related to the Tax Act. Excluding these and other smaller impacts as set forth in the "Non-GAAP financial measures" section of this MD&A, on an adjusted basis the ETR for the 2018 and 2017 periods was 23.8% and 27.2%, respectively. The decrease was driven primarily by the impact of the Tax Act enacted in the fourth quarter of 2017 which lowered the U.S. statutory tax rate from 35% in 2017 to 21% in 2018 (see Note 7 to the consolidated financial statements).

Equity income increased $9 million in 2018 versus 2017 and included charges of $9 million for purchase accounting impacts related to the fair value step up of equity investments acquired in the merger. Excluding this impact, equity income increased $18 million, primarily driven by income from equity investments acquired in the merger.

At December 31, 2018, reported noncontrolling interests from continuing operations consisted primarily of noncontrolling shareholders' investments in Asia (primarily in China) and surface technologies. Reported noncontrolling interests from continuing operations decreased $46 million to $15 million in 2018 from $61 million in 2017. 2018 includes the impact of the merger and related purchase accounting impacts. Excluding these impacts, adjusted noncontrolling interests from continuing operations of $73 million increased $12 million, or 20%, primarily due to noncontrolling interests acquired in the merger.

Reported income from continuing operations for 2018 was $4,273 million, $3,026 million, or 243%, higher than reported income from continuing operations of $1,247 million in 2017. Adjusted income from continuing operations of $2,121 million in 2018 was $431 million, or 26%, higher than adjusted income from continuing operations of $1,690 million in 2017 primarily due to higher adjusted operating profit and a lower effective tax rate.

Reported diluted earnings per share from continuing operations ("EPS") of $12.79 in 2018 increased $8.47 per diluted share, or 196% from $4.32 in 2017. Adjusted diluted EPS of $6.35 in 2018 increased $.50 per diluted share, or 9%, from adjusted diluted EPS of $5.85 in 2017. The increase in adjusted diluted EPS was primarily due to the merger and higher adjusted income from continuing operations, partially offset by an increase in diluted shares resulting from equity acquired in the merger.

Other comprehensive losses for the year ended December 31, 2018 of $299 million resulted primarily from (i) a $221 million unfavorable impact in the funded status of Linde's retirement obligations and (ii) adverse currency translation adjustments of $76 million, net of a benefit of $318 million related to the release of currency translation adjustments on Praxair's European business (See Note 4 to the consolidated financial statements). The decrease in the funded status of retirement obligations was primarily the result of higher current year actuarial losses, as the impact of higher U.S. discount rates was largely offset by a lower actual return on assets. Unfavorable translation adjustments reflect the impact of translating local currency foreign subsidiary financial statements into U.S. dollars, and are largely driven by the strengthening of the U.S. dollar against major currencies including the Euro, Brazilian real and Canadian dollar.

Unfavorable currency translation adjustments included $343 million in South America and $149 million in Asia, partially offset by favorable currency translation adjustments of $231 million related to Linde AG (primarily Europe and Asia) representing translation impacts for the period from merger date through December 31, 2018. Remaining other comprehensive losses of $2 million relate to the amortization of deferred losses on the company's derivatives and unrealized losses on available for sale securities. Refer to the Currency section of the MD&A and Notes 9 and 18 to the consolidated financial statements.

The number of employees at December 31, 2018 was 80,820, an increase of 54,359 employees from December 31, 2017 primarily driven by an increase of approximately 56,000 related to the merger partially offset by a decrease of approximately 2,500 from the divestiture of Praxair's European industrial gases business.

Other Financial Data

Earnings before interest taxes depreciation and amortization ("EBITDA") increased $3,458 million to $7,133 million in 2018 from $3,675 million in 2017. EBITDA in 2018 includes a gain on sale of businesses and purchase accounting impacts, and both periods include transaction and other costs. Excluding the impacts of these items, adjusted EBITDA increased $789 million to $4,516 million in 2018 from $3,727 million in 2017 driven by the consolidation of Linde AG starting October 31, 2018, and higher adjusted income from continuing operations plus depreciation and amortization versus the prior year.

See the "Non-GAAP Financial Measures" section for definitions and reconciliation of these non-GAAP measures to reported amounts.

Related Party Transactions

The company's related parties are primarily unconsolidated equity affiliates. The company did not engage in any material transactions involving related parties that included terms or other aspects that differ from those which would be negotiated with independent parties.

Environmental Matters

Linde's principal operations relate to the production and distribution of atmospheric and other industrial gases, which historically have not had a significant impact on the environment. However, worldwide costs relating to environmental

protection may continue to grow due to increasingly stringent laws and regulations, and Linde's ongoing commitment to rigorous internal standards. In addition, Linde may face physical risks from climate change and extreme weather.

Climate Change

Linde operates in jurisdictions that have, or are developing, laws and/or regulations to reduce or mitigate the perceived adverse effects of greenhouse gas ("GHG") emissions and faces a highly uncertain regulatory environment in this area. For example, the U.S. Environmental Protection Agency ("EPA") has promulgated rules requiring reporting of GHG emissions, and Linde and many of its suppliers and customers are subject to these rules. EPA has also promulgated regulations to restrict GHG emissions, including final rules regulating GHG emissions from light-duty vehicles and certain large manufacturing facilities, many of which are Linde suppliers or customers. In addition to these developments in the United States, GHGs are regulated in the European Union under the Emissions Trading System, which has wide implications for the company's customers and may impact certain operations of Linde in Europe. There are also requirements for mandatory reporting in Canada, which apply to certain Linde operations and will be used in developing cap-and-trade regulations on GHG emissions. These regulations are expected to impact certain Linde facilities in Canada. Climate change and energy efficiency laws and policies are also being widely introduced in jurisdictions throughout Latin America and parts of Asia. China has announced plans to implement its national carbon emissions trading system in 2020, though it does not appear the regulations will have a direct impact on GHG emissions from Linde facilities. Among other impacts, such regulations are expected to raise the cost of energy, which is a significant cost for Linde. Nevertheless, Linde's long-term customer contracts routinely provide rights to recover increased electricity, natural gas, and other costs that are incurred by the company as a result of climate change regulation.

Linde anticipates continued growth in its hydrogen business, as hydrogen is essential to refineries that use it to remove sulfur from transportation fuels in order to meet ambient air quality standards in the United States and fuel standards in other regions. Hydrogen production plants and a large number of other manufacturing and electricity-generating plants have been identified in California and the European Union as a source of carbon dioxide emissions and these plants are subject to cap-and-trade regulations in those jurisdictions. Linde believes it will be able to mitigate the costs of these regulations through the terms of its product supply contracts. However, legislation that limits GHG emissions may impact growth by increasing capital, compliance, operating and maintenance costs and/or decreasing demand.

To manage business risks from current and potential GHG emission regulation as well as physical consequences of climate change, Linde actively monitors current developments, evaluates the direct and indirect business risks, and takes appropriate actions. Among others, actions include: increasing relevant resources and training; maintaining contingency plans; obtaining advice and counsel from expert vendors, insurance providers and industry experts; incorporating GHG provisions in commercial agreements; and conducting regular reviews of the business risks with management. Although there are considerable uncertainties, Linde believes that the business risk from potential regulations can be effectively managed through its commercial contracts. Additionally, Linde does not anticipate any material effects regarding its plant operations or business arising from potential physical risks of climate change.

Linde continuously seeks opportunities to optimize energy use and GHG footprint through research and development in customer applications and rigorous operational energy efficiency, investment in renewable energy, and purchasing hydrogen as a chemical byproduct where feasible. Linde maintains related performance improvement targets and reports progress against these targets regularly to business management and annually to Linde's Board of Directors.

At the same time, Linde may benefit from business opportunities arising from governmental regulation of GHG and other emissions; uncertain costs of energy and certain natural resources; the development of renewable energy alternatives; and new technologies that help extract natural gas, improve air quality, increase energy efficiency and mitigate the impacts of climate change. Linde continues to develop new applications that can lower emissions, including GHG emissions, in Linde's processes and help customers lower energy consumption and increase product throughput. Stricter regulation of water quality in emerging economies such as China provide a growing market for a number of gases, e.g., oxygen for wastewater treatment. Increased concern about drought in areas such as California and Australia may create additional markets for carbon dioxide for desalination. Renewable fuel standards in the European Union and U.S. create a market for second-generation biofuels which use industrial gases such as oxygen, carbon dioxide, and hydrogen.

Costs Relating to the Protection of the Environment

Environmental protection costs in 2019 were not significant. Linde anticipates that future annual environmental protection expenditures will be similar to 2019, subject to any significant changes in existing laws and regulations. Based on historical results and current estimates, management does not believe that environmental expenditures will have a material adverse effect on the consolidated financial position, the consolidated results of operations or cash flows in any given year.

Legal Proceedings

See Note 19 to the consolidated financial statements for information concerning legal proceedings.

Retirement Benefits

Pensions

The net periodic benefit cost for the U.S. and international pension plans was $107 million in 2019, $24 million in 2018 and $58 million in 2017. The net periodic pension cost for 2019 includes pension settlement charges of $97 million related to lump sum payments, which were triggered by either a change in control provision or merger-related divestitures and a net curtailment charge of $8 million for termination benefits, primarily in connection with a defined benefit pension plan freeze. Settlement charges for 2018 and 2017 were $14 million and $2 million, respectively.

The funded status (pension benefit obligation ("PBO") less the fair value of plan assets) for the U.S. plans was a deficit of $504 million as of December 31, 2019 and a deficit of $556 million at December 31, 2018. The funded status for international plans was a deficit of $1,801 million as of December 31, 2019 and a deficit of $1,241 million at December 31, 2018. In the U.S., the benefit from the actual return on assets more than offset the impacts of unfavorable liability experience, resulting from the low discount rate environment. For the international plans, the unfavorable impact of lower discount rates outweighed favorable plan asset experience.

Global pension contributions were $94 million in 2019, $87 million in 2018 and $19 million in 2017. At a minimum, Linde contributes to its pension plans to comply with local regulatory requirements (e.g., ERISA in the United States). Discretionary contributions in excess of the local minimum requirements are made based on many factors, including long-term projections of the plans' funded status, the economic environment, potential risk of overfunding, pension insurance costs and alternative uses of cash. Changes to these factors can impact the timing of discretionary contributions from year to year. Estimated required contributions for 2020 are currently expected to be in the range of $50 million to $80 million.

Linde assumes expected returns on plan assets for 2020 of 7.00% and 5.31% for the U.S. and international plans, respectively, which are consistent with the long-term expected returns on its investment portfolios.

Excluding the impact of any settlements, 2020 consolidated pension expense is expected to be a benefit of approximately $45 million. The benefit derived from the expected return on assets assumption for Linde's most significant plans is anticipated to more than offset the expense from service and interest cost accruals and the amortization of deferred losses.

Refer to the Critical Accounting Policies section and Note 18 to the consolidated financial statements for a more detailed discussion of the company's retirement benefits, including a description of the various retirement plans and the assumptions used in the calculation of net periodic benefit cost and funded status.

Insurance

Linde purchases insurance to limit a variety of property and casualty risks, including those related to property, business interruption, third-party liability and workers' compensation. Currently, the company self retains up to $10 million per occurrence for vehicle liability in the United States, $5 million per occurrence for workers' compensation and general liability. In addition, the company self retains risk up to $5 million at its various properties worldwide for property damage resulting from fire, flood and other perils effecting its properties along with a separate $5 million deductible on all business interruption resulting from a major peril loss. To mitigate its aggregate loss potential above these retentions, the company purchases catastrophic insurance coverage from highly rated insurance companies. The company does not currently operate or participate in any captive insurance companies or other non-traditional risk transfer alternatives.

At December 31, 2019 and 2018, the company had recorded a total of $66 million and $60 million, respectively, representing an estimate of the retained liability for the ultimate cost of claims incurred and unpaid as of the balance sheet dates. The estimated liability is established using statistical analysis and is based upon historical experience, actuarial assumptions and professional judgment. These estimates are subject to the effects of trends in loss severity and frequency and are subject to a significant degree of inherent variability. If actual claims differ from the company's estimates, they will be adjusted at that time and financial results could be impacted.

Linde recognizes estimated insurance proceeds relating to damages at the time of loss only to the extent of incurred losses. Any insurance recoveries for business interruption and for property damages in excess of the net book value of the property are recognized only when realized or pending payments confirmed by its insurance companies.

SEGMENT DISCUSSION

Effective October 31, 2018, Praxair and Linde AG completed the previously announced merger, resulting in the formation of Linde plc (see Note 1 to the consolidated financial statements for additional information on the merger). As a result of the merger and effective with the lifting of the hold separate order effective on March 1, 2019, new operating segments were created which are used by the company's Chief Operating Decision Maker ("CODM") to allocate company resources and assess performance. Linde's operations consist of two major product lines: industrial gases and engineering. As further described in the following paragraph, Linde's industrial gases operations are managed on a geographic basis, which represents three of the company's new reportable segments - Americas, EMEA (Europe/Middle East/Africa), and APAC (Asia/South Pacific); a fourth reportable segment which represents the company's Engineering business, designs and manufactures equipment for air separation and other industrial gas applications specifically for end customers and is managed on a worldwide basis operating in all geographic segments. Other consists of corporate costs and a few smaller businesses which individually do not meet the quantitative thresholds for separate presentation.

The industrial gases product line centers on the manufacturing and distribution of atmospheric gases (oxygen, nitrogen, argon, rare gases) and process gases (carbon dioxide, helium, hydrogen, electronic gases, specialty gases, acetylene). Many of these products are co-products of the same manufacturing process. Linde manufactures and distributes nearly all of its products and manages its customer relationships on a regional basis. Linde's industrial gases are distributed to various end-markets within a regional segment through one of three basic distribution methods: on-site or tonnage; merchant or bulk; and packaged or cylinder gases. The distribution methods are generally integrated in order to best meet the customer's needs and very few of its products can be economically transported outside of a region. Therefore, the distribution economics are specific to the various geographies in which the company operates and are consistent with how management assesses performance.

The company's measure of profit/loss for segment reporting purposes remains unchanged - Segment operating profit. Segment operating profit is defined as operating profit excluding purchase accounting impacts of the Linde AG merger, intercompany royalties, and items not indicative of ongoing business trends. This is the manner in which the company's CODM assesses performance and allocates resources. For a description of Linde's previous operating segments, refer to Note 20 to the consolidated financial statements of Linde's 2018 Annual Report on Form 10-K.

The table below presents sales and operating profit information about reportable segments and Other for the year ended December 31, 2019, 2018 and 2017. The year ended December 31, 2019 reflects the results of both Praxair and Linde AG for the entire year. The year ended December 31, 2018 reflects the results of Praxair for the entire year and the results of Linde AG for the period beginning after October 31, 2018 (the merger date), including the impacts of purchase accounting (See Notes 1, 3 and 4 to the consolidated financial statements). The historical periods prior to 2018 reflect the results of Praxair. Prior periods presented have been recast to be consistent with the new segment structure.:

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Reported (Millions of dollars) Year Ended December 31,	2019	2018	2017	Variance 2019 vs. 2018	Variance 2018 vs. 2017
Sales					
Americas	$ 10,993	$ 8,017	$ 7,204	37 %	11 %
EMEA	6,643	2,644	1,520	151 %	74 %
APAC	5,839	2,446	1,571	139 %	56 %
Engineering	2,799	459	N/A	N/M	N/A
Other	1,954	1,270	1,063	54 %	19 %
	$ 28,228	$ 14,836	$ 11,358	90 %	31 %
Operating Profit					
Americas	$ 2,578	$ 2,053	$ 1,854	26 %	11 %
EMEA	1,367	481	317	184 %	52 %
APAC	1,198	465	329	158 %	41 %
Engineering	390	14	N/A	N/M	N/A
Other	(245)	(37)	(4)	N/M	N/M
Segment operating profit	5,288	2,976	2,496	78 %	19 %
Reconciliation to reported operating Profit :					
Cost reduction programs and other charges (Note 5)	(567)	(309)	(52)		
Net gain on sale of businesses	164	3,294	N/A		
Purchase accounting impacts - Linde AG	(1,952)	(714)	N/A		
Total operating profit	$ 2,933	$ 5,247	$ 2,444		

Pro Forma *(Dollar amounts in millions)* Year Ended December 31,	2019	2018	Variance 2019 vs. 2018
Sales			
Americas	$ 10,989	$ 10,539	4 %
EMEA	6,643	6,991	(5)%
APAC	5,779	5,950	(3)%
Engineering	2,799	2,792	— %
Other	1,953	1,812	8 %
	$ 28,163	$ 28,084	— %
Operating Profit			
Americas	$ 2,577	$ 2,433	6 %
EMEA	1,367	1,344	2 %
APAC	1,184	1,029	15 %
Engineering	390	285	37 %
Other	(246)	(295)	(17)%
Segment operating profit	$ 5,272	$ 4,796	10 %

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Americas

(Dollar amounts in millions) Year Ended December 31,	2019	2018	2017	Variance 2019 vs. 2018	Variance 2018 vs. 2017
Reported sales	$ 10,993	$ 8,017	$ 7,204	37%	11%
Pro forma sales	$ 10,989	$ 10,539	N/A	4%	N/A
Reported operating profit	$ 2,578	$ 2,053	$ 1,854	26%	11%
As a percent of sales	23.5%	25.6%	25.7%		
Pro forma operating profit	$ 2,577	$ 2,433	N/A	6%	N/A
As a percent of sales	23.5%	23.1%	N/A		

	2019 vs. 2018 % Change Reported	2019 vs. 2018 % Change Pro forma	2018 vs. 2017 % Change Reported
Factors Contributing to Changes - Sales			
Volume/Equipment	— %	1 %	3 %
Price/Mix	3 %	3 %	2 %
Cost pass-through	(1)%	(1)%	1 %
Currency	(2)%	(2)%	(2)%
Acquisitions/Divestitures	37 %	3 %	7 %
	37 %	4 %	11 %

The Americas segment includes Linde’s industrial gases operations in approximately 20 countries including the United States, Canada, Mexico and Brazil.

Sales

Reported sales for the Americas segment for 2019 increased $2,976 million, or 37%, versus 2018, primarily due to the merger. On a pro forma basis, sales increased $450 million, or 4%, versus 2018.

On a reported basis, sales increased 37% in 2019 primarily due to the merger. Higher pricing contributed 3% to sales. Unfavorable currency translation decreased sales by 2%, primarily driven by the weakening of the Brazilian real, Mexican peso and Canadian dollar against the U.S. Dollar. Lower cost past-through, primarily natural gas, decreased sales by 1% with minimal impact on operating profit.

On a pro forma basis, volume growth contributed 1% to sales in 2019 as compared to 2018 primarily driven by base volume growth in the United States and Latin America and project start ups in the United States Gulf Coast. Higher pricing contributed 3% to sales. Currency translation decreased sales by 2%. Acquisitions and divestitures increased sales by 3%, related primarily to acquisitions in North America. Lower cost pass-through decreased sales by 1% with minimal impact on operating profit.

Reported sales for 2018 increased $813 million, or 11%, versus 2017 primarily due to the merger which contributed 7% to sales. Underlying sales growth was 4%, driven by higher volumes and higher price. Unfavorable currency impacts decreased sales by 2%. Higher cost pass-through increased sales by 1% with minimal impact on operating profit.

Operating Profit

Reported operating profit for the Americas segment for 2019 increased $525 million, or 26% from 2018, due primarily to the merger. On a pro forma basis, operating profit increased $144 million, or 6%, for 2019 as compared to 2018.

On a reported basis, operating profit increased 26% in 2019 largely driven by the merger and higher pricing, partially offset by unfavorable currency translation impacts of 2%.

Pro forma operating profit in the Americas segment increased $144 million for 2019, or 6%, versus the 2018 period. Operating growth from higher volumes, higher price and acquisitions was partially offset by unfavorable currency translation impacts of 2% in the year. The 2018 year also included net gains on asset disposals of approximately $20 million.

Reported operating profit for 2018 increased $199 million, or 11%, driven primarily by the merger, higher volumes and higher price partially offset by unfavorable currency translation. The 2018 period also included net gains on asset disposals of $13 million.

EMEA

(Dollar amounts in millions) Year Ended December 31,	2019	2018	2017	Variance 2019 vs. 2018	Variance 2018 vs. 2017
Reported sales	$ 6,643	$ 2,644	$ 1,520	151 %	74 %
Pro forma sales	$ 6,643	$ 6,991	N/A	(5 %)	N/A
Reported operating profit	$ 1,367	$ 481	$ 317	184 %	52 %
As a percent of sales	20.6 %	18.2 %	20.9 %		
Pro forma operating profit	$ 1,367	$ 1,344	N/A	2 %	N/A
As a percent of sales	20.6 %	19.2 %	N/A		

Factors Contributing to Changes	2019 vs. 2018 % Change Reported	2019 vs. 2018 % Change Pro forma	2018 vs. 2017 % Change Reported
Volume	(1 %)	(1 %)	1 %
Price/Mix	1 %	2 %	2 %
Cost pass-through	(1 %)	— %	2 %
Currency	(1 %)	(6 %)	4 %
Acquisitions/Divestitures	153 %	— %	65 %
	151 %	(5 %)	74 %

The EMEA segment includes Linde's industrial gases operations in approximately 45 European, Middle Eastern and African countries including Germany, France, Sweden, the Republic of South Africa, and the United Kingdom.

Sales

On a reported basis, EMEA segment sales increased by $3,999 million, or 151%, in 2019 as compared to 2018, primarily due to the merger, net of related divestitures. On a pro forma basis, sales decreased $348 million, or 5%, in 2019 versus 2018.

On a reported basis, sales increased 151% in 2019 driven primarily by the net impact of the merger with Linde AG and the related divestiture of Praxair's European gases business in the fourth quarter of 2018. Excluding this net impact, sales decreased 2%. Volumes decreased 1% driven by weaker industrial production. Higher price contributed 1% to sales. Unfavorable currency translation and cost pass-through each decreased sales by 1%.

On a pro forma basis, sales decreased 5% in 2019, primarily driven by unfavorable currency translation due to the weakening of the Euro, British pound and South African rand against the U.S. Dollar which decreased sales by 6% . Higher price increased sales by 2%. Volumes decreased 1% driven by weaker industrial production.

Reported sales increased $1,124 million, or 74%, in 2018 driven primarily by the merger, net of related divestitures. Excluding the impact of the merger and related divestitures, sales increase 9% from 2017. Higher cost pass-through increased sales by 2% with minimal impact on operating profit. Favorable currency translation increased sales by 4%. Higher volumes and higher price increased sales by 1% and 2%, respectively.

Operating Profit

On a reported basis, operating profit for the EMEA segment increased by $886 million, or 184%, in 2019 as compared to 2018. On a pro forma basis, operating profit increased $23 million, or 2%, in 2019 versus the respective 2018 period.

On a reported basis, operating profit increased 184% in 2019, driven primarily by the net impact of the merger with Linde AG and the related divestiture of Praxair's European gases business in the fourth quarter of 2018.

On a pro forma basis, operating profit increased 2% in 2019 as compared to 2018 as higher pricing and the impact of cost reduction actions more than offset the impacts of unfavorable currency translation and cost inflation.

Reported operating profit increased $164 million, or 52%, in 2018 driven primarily by the merger, net of related divestitures. Favorable currency translation increased operating profit by 5%. Excluding the impact of the merger and related divestitures and currency, operating profit increased driven by higher price and higher volumes, partially offset by cost inflation.

APAC

(Dollar amounts in millions) Year Ended December 31,	2019	2018	2017	Variance 2019 vs. 2018	Variance 2018 vs. 2017
Reported sales	$ 5,839	$ 2,446	$ 1,571	139 %	56 %
Pro forma sales	$ 5,779	$ 5,950	N/A	(3 %)	N/A
Reported operating profit	$ 1,198	$ 465	$ 329	158 %	41 %
As a percent of sales	20.5 %	19.0 %			
Pro forma operating profit	$ 1,184	$ 1,029	N/A	15 %	N/A
As a percent of sales	20.5 %	17.3 %	N/A		

	2019 vs. 2018 % Change Reported	2019 vs. 2018 % Change Pro forma	2018 vs. 2017 % Change Reported
Factors Contributing to Changes			
Volume	4 %	1 %	9 %
Price/Mix	2 %	2 %	2 %
Cost pass-through	— %	(1 %)	1 %
Currency	(3 %)	(4 %)	1 %
Acquisitions/Divestitures	136 %	(1 %)	43 %
	139 %	(3 %)	56 %

The APAC segment includes Linde's industrial gases operations in approximately 20 Asian and South Pacific countries and regions including China, Australia, India, South Korea and Taiwan.

Sales

On a reported basis, APAC segment sales increased by $3,393 million, or 139%, in 2019 as compared to 2018, primarily due to the merger. On a pro forma basis, sales decreased $171 million, or 3%, in 2019 versus 2018.

On a reported basis, sales increased 139% in 2019 driven by the merger. Unfavorable currency translation decreased sales by 3%, driven primarily by the weakening of the Chinese yuan, Korean won and Indian rupee against the U.S. Dollar. Excluding the impacts of the merger and currency, sales increased by 6% driven by higher base volumes, new project start ups and higher price.

On a pro forma basis, sales decreased 3% in 2019. Higher pricing increased sales by 2%. Higher volumes contributed 1% to sales driven by higher base volumes and new project start-ups. Currency translation decreased sales by 4%. Lower cost pass-through decreased sales by 1% with minimal impact on operating profit. Acquisitions and divestitures decreased sales by 1%.

Reported sales in 2018 increased $875 million, or 56%, versus 2017 driven primarily by the merger which contributed 43% to sales. Cost pass-through, primarily energy, and currency impacts each increased sales by 1%. Volume growth of 9% was primarily attributable to base volume growth in China, Korea and India and new project start-ups in China. Higher price increased sales by 2% driven by China.

Operating Profit

On a reported basis, operating profit for the APAC segment increased by $733 million, or 158%, in 2019 as compared to 2018, due primarily to the merger. On a pro forma basis, operating profit increased $155 million, or 15%, in 2019 versus the respective 2018 period.

On a reported basis, operating profit increased 158% in 2019, driven by the net impact of the merger with Linde AG. Unfavorable currency translation decreased operating profit by 3% for the year. Excluding the merger and currency impacts, operating profit growth was driven by higher price and cost reduction programs.

On a pro forma basis, operating profit increased 15% in 2019 as compared to 2018. Unfavorable currency translation decreased operating profit by 5% in the year. Excluding currency impacts, operating growth was driven by higher price and cost reduction programs.

Reported operating profit in 2018 increased $136 million, or 41%, versus 2017 driven primarily by the merger, higher volumes and price. Operating profit for 2018 included a $22 million asset impairment charge, offset by a litigation settlement gain.

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Engineering

(Dollar amounts in millions) Year Ended December 31,	2019	2018	2017	Variance 2019 vs. 2018	Variance 2018 vs. 2017
Reported sales	$ 2,799	$ 459	N/A	510 %	100 %
Pro forma sales	$ 2,799	$ 2,792	N/A	— %	N/A
Reported operating profit	$ 390	$ 14	N/A	N/M	100 %
As a percent of sales	13.9 %	3.1 %			
Pro forma operating profit	$ 390	$ 285	N/A	37 %	N/A
As a percent of sales	13.9 %	10.2 %	N/A		

Factors Contributing to Changes	2019 vs. 2018 % Change Reported	2019 vs. 2018 % Change Pro forma	2018 vs. 2017 % Change Reported
Volume/Price	8 %	4 %	— %
Currency	(2)%	(4)%	— %
Acquisitions/Divestitures	504 %	— %	100 %
	510 %	— %	100 %

Sales

Reported Engineering segment sales increased $2,340 million, or 510%, in 2019 as compared to the respective 2018 period. On a pro forma basis, segment sales increased $7 million in 2019 as compared to the respective 2018 period.

On a reported basis, 2019 sales increased 510% in year primarily related to the merger of the Linde Engineering business. Excluding the impact of the merger, volume growth of 8% was partially offset by unfavorable currency translation of 2%.

On a pro forma basis, 2019 sales were flat versus 2018 as volume growth of 4% was offset by unfavorable currency translation of 4%.

Reported sales for 2018 increased 100% versus 2017 due to the merger of the Linde Engineering business.

Operating profit

Reported Engineering segment operating profit increased $376 million, or 2,686%, in 2019 versus 2018. On a pro forma basis, operating profit increased $105 million, or 37%, in 2019 versus 2018.

On a reported basis, operating profit increased in 2019 related primarily to the merger of the Linde Engineering business.

On a pro forma basis, operating profit increased 37% for the year. Unfavorable currency translation decreased operating profit by 4% in 2019. Excluding the impact of currency, operating profit increased due to timing of project completion, favorable costs and procurement savings.

Reported operating profit for 2018 increased 100% versus 2017 due to the merger of the Linde Engineering business.

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Other

(Dollar amounts in millions) Year Ended December 31,	2019	2018	2017	Variance 2019 vs. 2018	Variance 2018 vs. 2017
Reported sales	$ 1,954	$ 1,270	$ 1,063	54 %	19 %
Pro forma sales	$ 1,953	$ 1,812	N/A	8 %	N/A
Reported operating profit	$ (245)	$ (37)	$ (4)	(562)%	825 %
As a percent of sales	(12.5)%	(2.9)%			
Pro forma operating profit	$ (246)	$ (295)	N/A	17 %	N/A
As a percent of sales	(12.6)%	(16.3)%	N/A		

Factors Contributing to Changes	2019 vs. 2018 % Change Reported	2019 vs. 2018 % Change Pro forma	2018 vs. 2017 % Change Reported
Volume/Price	9 %	12 %	8 %
Currency	(2)%	(4)%	2 %
Acquisitions/Divestitures	47 %	— %	9 %
	54 %	8 %	19 %

Other consists of corporate costs and a few smaller businesses including: Surface Technologies, GIST, global helium wholesale, and Electronic Materials; which individually do not meet the quantitative thresholds for separate presentation.

Sales

Reported sales for Other increased $684 million, or 54%, for the 2019 year versus the respective 2018 period, primarily due to the merger. On a pro forma basis, sales increased $141 million, or 8%, for 2019 versus the respective 2018 periods.

On a reported basis, sales increased 54% for the year, primarily due to the merger which increased sales by 47%. Higher volumes and price increased sales by 9% in the year, primarily driven by higher surface technologies volumes to the aerospace and manufacturing end-markets and higher price. Currency translation decreased sales by 2% for the year.

On a pro forma basis, sales increased 8% for 2019. Volume and price growth increased sales by 12%, driven by helium and surface technologies. Currency translation decreased sales by 4%.

Reported sales for 2018 increased $207 million, or 19%, versus 2017 driven primarily by the merger. Excluding the impact of the merger, underlying sales increased driven by surface technologies volumes to the aerospace and manufacturing end-markets and higher price.

Operating profit

Reported operating profit in Other decreased $208 million in 2019 versus the respective 2018 periods, due primarily to the merger. On a pro forma basis, operating loss improved $49 million, or 17%, when comparing 2019 to the 2018 period.

On a reported basis, operating profit decreased $208 million primarily related to the merger as operating profit increases from higher volumes and price were more than offset by the merger of Linde AG corporate.

On a pro forma basis, operating profit improved $49 million in the year. Higher volumes, helium pricing and cost reduction actions improved operating profit which was partially offset by higher helium sourcing costs.

Reported operating profit for 2018 decreased $33 million versus 2017 primarily related to the merger as operating profit increases from higher volumes and price were more than offset by the merger of Linde AG corporate.

Currency

The results of Linde's non-U.S. operations are translated to the company's reporting currency, the U.S. dollar, from the functional currencies used in the countries in which the company operates. For most foreign operations, Linde uses the local currency as its functional currency. There is inherent variability and unpredictability in the relationship of these functional currencies to the U.S. dollar and such currency movements may materially impact Linde's results of operations in any given period.

To help understand the reported results, the following is a summary of the significant currencies underlying Linde's consolidated results and the exchange rates used to translate the financial statements (rates of exchange expressed in units of local currency per U.S. dollar):

	Percent of 2019 Consolidated Sales	Statements of Income			Balance Sheets	
		Average Year Ended December 31,			December 31,	
Currency		2019	2018	2017	2019	2018
Euro	20 %	0.89	0.85	0.89	0.89	0.87
Chinese yuan	7 %	6.90	6.60	6.76	6.96	6.88
British pound	6 %	0.78	0.75	0.78	0.75	0.78
Australian dollar	4 %	1.44	1.34	N/A	1.42	1.42
Brazilian real	4 %	3.94	3.63	3.19	4.03	3.87
Korean won	3 %	1,165	1,100	1,131	1,156	1,111
Canadian dollar	3 %	1.33	1.30	1.30	1.30	1.36
Mexican peso	2 %	19.24	19.20	18.86	18.93	19.65
Taiwan dollar	2 %	30.90	30.13	30.43	29.99	30.55
Indian rupee	2 %	70.40	68.00	65.00	71.38	69.77
South African rand	1 %	14.43	13.16	N/A	14.00	14.35
Swedish kroner	1 %	9.45	8.68	8.53	9.37	8.85
Thailand bhat	1 %	31.04	32.30	33.91	29.71	32.33

LIQUIDITY, CAPITAL RESOURCES AND OTHER FINANCIAL DATA

(Millions of dollars) Year Ended December 31,	2019	2018	2017
Net Cash Provided by (Used for)			
Operating Activities			
Income from continuing operations (including noncontrolling interests)	$ 2,272	$ 4,288	$ 1,308
Non-cash charges (credits):			
Add: Cost reduction programs and other charges, net of payments (a)	(236)	40	26
Add: Amortization of merger-related inventory step-up	12	368	—
Less: Net gain on sale of businesses, net of tax (b)	(108)	(2,923)	—
Add: Tax Act income tax charge, net	—	(61)	394
Add: Depreciation and amortization	4,675	1,830	1,184
Add (Less): Deferred income taxes, excluding Tax Act	(303)	(187)	136
Add (Less): non-cash charges and other	(32)	237	102
Income from continuing operations adjusted for non-cash charges and other	6,280	3,592	3,150
Less: Pension contributions	(94)	(87)	(19)
Add (Less): Working capital	(160)	202	(158)
Add (Less): Other	93	(53)	68
Net cash provided by operating activities	$ 6,119	$ 3,654	$ 3,041
Investing Activities			
Capital expenditures	$ (3,682)	$ (1,883)	$ (1,311)
Acquisitions, net of cash acquired	(225)	(25)	(33)
Divestitures and asset sales, net of cash divested	5,096	5,908	30
Cash acquired in merger transaction	—	1,363	—
Net cash provided by (used for) investing activities	$ 1,189	$ 5,363	$ (1,314)
Financing Activities			
Debt increases (decreases) – net	$ (1,260)	$ (2,908)	$ (771)
Issuances (purchases) of ordinary shares – net	(2,586)	(522)	108
Cash dividends – Linde plc shareholders	(1,891)	(1,166)	(901)
Noncontrolling interest transactions and other	(3,260)	(402)	(92)
Net cash (used) for financing activities	$ (8,997)	$ (4,998)	$ (1,656)
Effect of exchange rate changes on cash	$ (77)	$ (60)	$ 22
Cash and cash equivalents, end-of-period	$ 2,700	$ 4,466	$ 617

(a) See Note 5 to the consolidated financial statements.

(b) See Note 4 to the consolidated financial statements.

Cash decreased $1,766 million in 2019 versus 2018. The primary sources of cash in 2019 were cash flows from operations of $6,119 million and proceeds from divestitures and asset sales of $5,096 million. The primary uses of cash included capital expenditures of $3,682 million, transactions with noncontrolling interests of $3,260 million, net purchases of ordinary shares of $2,586 million, cash dividends to shareholders of $1,891 million and net debt repayments of $1,260 million. Noncontrolling interest transactions and other of $3,260 million included a payment of approximately $3.2 billion related to the cash-merger squeeze-out of the 8% of Linde AG shares completed on April 8, 2019 (see Note 16 to the consolidated financial statements).

Cash Flows From Operations

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2019 compared with 2018

Cash flows from operations was $6,119 million, or 22% of sales, an increase of $2,465 million from $3,654 million, or 25% of sales in 2018. The increase was primarily attributable to the merger which drove higher net income adjusted for non-cash charges, partially offset by higher working capital requirements and higher merger and synergy related cash outflows. 2019 included merger and synergy related cash outflows of $803 million, of which $567 million is included within "Net income (including noncontrolling interests)" and $236 million is included within "Cost reduction programs and other charges, net of payments".

2018 compared with 2017

Cash flows from operations was $3,654 million, or 25% of sales, an increase of $613 million from $3,041 million, or 27% of sales in 2017. The increase was primarily attributable to the merger, higher net income adjusted for non-cash charges and favorable working capital requirements, partially offset by unfavorable changes in other long–term assets and liabilities and higher pension contributions.

Investing

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2019 compared with 2018

Net cash provided by investing activities of $1,189 million decreased $4,174 million from 2018 primarily driven by lower proceeds from merger-related divestitures, cash acquired in the merger and higher capital expenditures.

Capital expenditures in 2019 were $3,682 million, an increase of $1,799 million from 2018, driven primarily by the merger. Capital expenditures during 2019 related primarily to investments in new plant and production equipment for growth. Approximately 44% of the capital expenditures were in the Americas segment with 33% in the APAC segment and the rest primarily in the EMEA segment.

Acquisition expenditures in 2019 were $225 million, an increase of $200 million from 2018 and related primarily to acquisitions in the Americas.

Divestitures and asset sales in 2019 totaled $5,096 million primarily driven by proceeds from merger-related divestitures including $3.4 billion from the sale of Linde AG's Americas business, $1.2 billion from the sale of Linde Korea, and approximately $200 million each from the sale of the legacy Praxair and legacy Linde India selected assets (see Note 4 to the consolidated financial statements). 2018 divestiture and asset sale cash flows included $5.6 billion from the sale of Praxair's European business and $214 million related to the sale of Praxair's Italian joint venture (see Note 4 to the consolidated financial statements).

2018 compared with 2017

Net cash provided by investing activities of $5,363 million increased $6,677 million from 2017 primarily driven by proceeds from the divestiture of Praxair's European business and cash acquired in the merger, partially offset by higher capital expenditures.

Capital expenditures in 2018 were $1,883 million, an increase of $572 million from 2017, driven primarily by the merger with Linde AG. Capital expenditures during 2019 related primarily to investments in new plant and production equipment for growth and density.

Acquisition expenditures in 2018 were $25 million, a decrease of $8 million from 2017. Additionally, $1,363 million of cash was acquired in the merger (see Note 3 to the consolidated financial statements).

Divestitures and asset sales in 2018 totaled $5,908 million primarily driven by proceeds from merger-related divestitures including $5.6 billion from the sale of Praxair's European business and $214 million related to the sale of Praxair's Italian joint venture (see Note 4 to the consolidated financial statements).

Financing

Linde’s financing strategy is to secure long-term committed funding by issuing public notes and debentures and commercial paper backed by a long-term bank credit agreement. Linde’s international operations are funded through a combination of local borrowing and intercompany funding to minimize the total cost of funds and to manage and centralize currency exchange exposures. As deemed necessary, Linde manages its exposure to interest-rate changes through the use of financial derivatives (see Note 14 to the consolidated financial statements and Item 7A. Quantitative and Qualitative Disclosures About Market Risk).

Cash used for financing activities was $8,997 million in 2019 compared to $4,998 million in 2018. The primary financing uses of cash were for transactions with noncontrolling interests, net debt repayments, cash dividends and net purchases of Linde ordinary shares. Noncontrolling interest transactions and other payments of $3,260 million increased $2,858 million from 2018 driven by a payment of approximately $3.2 billion for the cash-merger squeeze-out of the 8% of Linde AG shares completed on April 8, 2019 (see Note 16 to the consolidated financial statements). Amounts paid in 2018 include $315 million for the purchase of the noncontrolling interest in Praxair's Italian joint venture in a merger-related transaction (see Note 4 to the consolidated financial statements) and $25 million in interest related to the early redemption of bonds. Cash dividends of $1,891 million increased $725 million from 2018 driven primarily by higher shares outstanding after the merger and a 6% increase in dividends per share from $3.30 to $3.50. Net purchases of ordinary shares were $2,586 million in 2019 versus $522 million in 2018 driven by increased share repurchases. The cash used for debt repayments-net of $1,260 million decreased $1,648 million from $2,908 million during 2018 while cash decreased $1,766 million. Net debt (calculated as total debt less cash and cash equivalents) increased $426 million primarily due to lower cash balances partially offset by debt repayments.

The company believes that it has sufficient operating flexibility, cash reserves, and funding sources to maintain adequate amounts of liquidity to meet its business needs around the world. At December 31, 2019, Linde's credit ratings as reported by Standard & Poor’s and Moody’s were A-1 and P-1 for short-term debt, respectively, and A and A2 for long-term debt, respectively.

Note 13 to the consolidated financial statements includes information with respect to the company’s debt repayments in 2019, current debt position, debt covenants and the available credit facilities; and Note 14 includes information relating to derivative financial instruments. Linde's credit facilities are with major financial institutions and are non-cancelable until maturity. Therefore, the company believes the risk of the financial institutions being unable to make required loans under the credit facilities, if requested, to be low. Linde’s major bank credit and long-term debt agreements contain standard covenants. The company was in compliance with these covenants at December 31, 2019 and expects to remain in compliance for the foreseeable future.

Linde’s total net debt outstanding at December 31, 2019 was $11,256 million, $426 million higher than $10,830 million at December 31, 2018. The December 31, 2019 net debt balance includes $12,752 million in public securities, $1,204 million representing primarily worldwide bank borrowings, net of $2,700 million of cash. Linde’s global effective borrowing rate was approximately 2% for 2019.

In February 2019, Linde repaid $500 million of 1.90% rate notes that became due; in May 2019 Linde repaid $150 million of variable rate notes that became due; in June 2019 Linde repaid €500 million of 1.75% notes that due and AUD100 million of variable rate notes that became due; in August 2019 Linde repaid $200 million of variable rate notes that became due.

On March 26, 2019 the company and certain of its subsidiaries entered into an unsecured revolving credit agreement ("the Credit Agreement") with a syndicate of banking institutions, which became effective on March 29, 2019. The Credit Agreement provides for total commitments of $5.0 billion, which may be increased up to $6.5 billion, subject to receipt of additional commitments and satisfaction of customary conditions. There are no financial maintenance covenants contained within the Credit Agreement. The revolving credit facility expires on March 26, 2024 with the option to request two one-year extensions of the expiration date. In connection with the effectiveness of the Credit Agreement, Praxair and Linde AG terminated their respective existing revolving credit facilities. No borrowings were outstanding under the Credit Agreement as of December 31, 2019.

On September 3, 2019, Linde and the company’s subsidiaries Praxair and Linde AG entered into a series of parent and subsidiary guarantees related to currently outstanding notes issued by Praxair and Linde AG as well as the $5 billion Credit Agreement.

On December 10, 2018, the company announced a $1.0 billion share repurchase program, which was completed in February of 2019. On January 22, 2019, the company’s board of directors approved the additional repurchase of $6.0 billion of its ordinary shares, of which $2.3 billion had been repurchased through December 31, 2019. For additional information related to the share repurchase programs, see Part II Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities.

CONTRACTUAL OBLIGATIONS

The following table sets forth Linde's material contract obligations and other commercial commitments as of December 31, 2019:

(Millions of dollars)	Due or expiring by December 31,						
	2020	2021	2022	2023	2024	Thereafter	Total
Long-term debt obligations:							
Debt and capitalized lease maturities (Note 13)	$ 1,531	$ 1,855	$ 2,330	$ 1,798	$ 983	$ 3,727	$ 12,224
Contractual interest	297	237	175	146	98	585	1,538
Operating leases (Note 6)	275	208	163	110	75	251	1,082
Retirement obligations	101	36	37	37	36	183	430
Unconditional purchase obligations	833	769	718	660	650	2,877	6,507
Construction commitments	2,234	871	291	25	—	—	3,421
Total Contractual Obligations	$ 5,271	$ 3,976	$ 3,714	$ 2,776	$ 1,842	$ 7,623	$ 25,202

Contractual interest on long-term debt of $1,538 million represents interest the company is contracted to pay on outstanding long-term debt, current portion of long-term debt and capital lease obligations, calculated on a basis consistent with planned debt maturities, excluding the interest impact of interest rate swaps. At December 31, 2019, Linde had fixed-rate debt of $10,799 million and floating-rate debt of $3,157 million. The rate assumed for floating-rate debt was the rate in effect at December 31, 2019.

Retirement obligations of $430 million include estimates of pension plan contributions and expected future benefit payments for unfunded pension and OPEB plans. Pension plan contributions are forecasted for 2020 only. For purposes of the table, $60 million of estimated contributions have been included for 2020. Expected future unfunded pension and OPEB benefit payments are forecasted only through 2029. Contribution and unfunded benefit payment estimates are based upon current valuation assumptions. Estimates of pension contributions after 2020 and unfunded benefit payments after 2029 are not included in the table because the timing of their resolution cannot be estimated. Retirement obligations are more fully described in Note 18 to the consolidated financial statements.

Unconditional purchase obligations of $6,507 million represent contractual commitments under various long and short-term take-or-pay arrangements with suppliers and are not included on Linde's balance sheet. These obligations are primarily minimum-purchase commitments for helium, electricity, natural gas and feedstock used to produce atmospheric and process gases. A significant portion of these obligations is passed on to customers through similar take-or-pay or other contractual arrangements. Purchase obligations that are not passed along to customers through such contractual arrangements are subject to market conditions, but do not represent a material risk to Linde. Approximately $2,983 million of the purchase obligations relates to power and is intended to secure the uninterrupted supply of electricity and feedstock to Linde's plants to reliably satisfy customer product supply obligations, and extend through 2030. Certain of the power contracts contain various cancellation provisions requiring supplier agreement, and many are subject to annual escalations based on local inflation factors.

Construction commitments of $3,421 million represent outstanding commitments to complete authorized construction projects as of December 31, 2019. A significant portion of Linde's capital spending is related to the construction of new production facilities to satisfy customer commitments which may take a year or more to complete.

Liabilities for uncertain tax positions totaling $415 million, including interest and penalties, are not included in the table because the timing of their resolution cannot be estimated. Tax liabilities for deemed repatriation of earnings of $261 million are payable over the next six years. See Note 7 to the consolidated financial statements for disclosures surrounding the "Tax Act" and uncertain income tax positions.

OFF-BALANCE SHEET ARRANGEMENTS

As discussed in Note 19 to the consolidated financial statements, at December 31, 2019, Linde had undrawn outstanding letters of credit, bank guarantees and surety bonds entered into in connection with normal business operations and they are not reasonably likely to have a material impact on Linde’s consolidated financial condition, results of operations, or liquidity.

CRITICAL ACCOUNTING POLICIES

The policies discussed below are considered by management to be critical to understanding Linde’s financial statements and accompanying notes prepared in accordance with accounting principles generally accepted in the United States ("U.S. GAAP"). Their application places significant importance on management’s judgment as a result of the need to make estimates of matters that are inherently uncertain. Linde’s financial position, results of operations and cash flows could be materially affected if actual results differ from estimates made. These policies are determined by management and have been reviewed by Linde’s Audit Committee.

Purchase Accounting

Linde AG’s assets and liabilities were measured at fair value as of the date of the merger. Estimates of fair value represent management's best estimate of assumptions about future events and uncertainties. In determining the fair value, Linde utilized various forms of the income, cost and market approaches depending on the asset or liability being fair valued. The estimation of fair value includes significant judgments related to future cash flows (sales, costs, customer attrition rates, and contributory asset charges), discount rates, competitive trends, market comparables and others. Inputs were generally obtained from historical data supplemented by current and anticipated market conditions and growth rates. The estimates and assumptions used to determine the estimated fair value assigned to each class of assets and liabilities, as well as asset lives, have a material impact to the company's consolidated financial statements, and are based upon assumptions believed to be reasonable but that are inherently uncertain. As of the end of 2019, the valuation process to determine the fair value of the acquired assets and liabilities is complete.

See Note 3 to the consolidated financial statements for additional information.

Depreciation and Amortization

Depreciable Lives of Property, Plant and Equipment

Linde’s net property, plant and equipment at December 31, 2019 was $29,064 million, representing 34% of the company’s consolidated total assets. Depreciation expense for the year ended December 31, 2019 was $3,940 million, or 16% of total operating costs. Management judgment is required in the determination of the estimated depreciable lives that are used to calculate the annual depreciation expense and accumulated depreciation.

Property, plant and equipment are recorded at cost and depreciated over the assets’ estimated useful lives on a straight-line basis for financial reporting purposes. The estimated useful life represents the projected period of time that the asset will be productively employed by the company and is determined by management based on many factors, including historical experience with similar assets, technological life cycles, geographic locations and contractual supply relationships with on-site customers. Circumstances and events relating to these assets, such as on-site contract modifications, are monitored to ensure that changes in asset lives or impairments (see “Asset Impairments”) are identified and prospective depreciation expense or impairment expense is adjusted accordingly. Linde’s largest asset values relate to cryogenic air-separation production plants with depreciable lives of principally 15 years.

Based upon the assets as of December 31, 2019, if depreciable lives of machinery and equipment, on average, were increased or decreased by one year, annual depreciation expense would be decreased by approximately $471 million or increased by approximately $618 million, respectively.

See Notes 3, 9 and 10 to the consolidated financial statements for additional information.

Amortization of Other Intangible Assets

Linde’s net other intangible assets at December 31, 2019 was $16,137 million, representing 19% of the company’s consolidated total assets, including $1,870 million of indefinite-lived intangibles. Amortization expense related to finite-lived intangible assets for the year ended December 31, 2019 was $735 million, or 3% of total operating costs. Management judgment is required in the determination of the estimated amortizable lives that are used to calculate the annual amortization expense and accumulated amortization. See Note 12 to the consolidated financial statements.

Based upon the assets as of December 31, 2019, if amortization lives of other intangible assets, on average, were increased or decreased by one year, annual amortization expense would be decreased by approximately $33 million or increased by approximately $36 million, respectively.

See Notes 3, 9, and 12 to the consolidated financial statements for additional information.

Revenue Recognition

Long-Term Construction Contracts

The company designs and manufactures equipment for air separation and other varied gas production and processing plants manufactured specifically for end customers. Revenue from sale of equipment is generally recognized over time as Linde has an enforceable right to payment for performance completed to date and performance does not create an asset with alternative use. For contracts recognized over time, revenue is recognized primarily using a cost incurred input method. Costs incurred to date relative to total estimated costs at completion are used to measure progress toward satisfying performance obligations. Costs incurred include material, labor, and overhead costs and represent work contributing and proportionate to the transfer of control to the customer. Contract modifications are typically accounted for as part of the existing contract and are recognized as a cumulative adjustment for the inception-to-date effect of such change. We assess performance as progress towards completion is achieved on specific projects, earnings will be impacted by changes to our forecast of revenues and costs on these projects.

Pension Benefits

Pension benefits represent financial obligations that will be ultimately settled in the future with employees who meet eligibility requirements. Because of the uncertainties involved in estimating the timing and amount of future payments, significant estimates are required to calculate pension expense and liabilities related to the company's plans. The company utilizes the services of independent actuaries, whose models are used to facilitate these calculations.

Several key assumptions are used in actuarial models to calculate pension expense and liability amounts recorded in the financial statements. Management believes the three most significant variables in the models are the expected long-term rate of return on plan assets, the discount rate, and the expected rate of compensation increase. The actuarial models also use assumptions for various other factors, including employee turnover, retirement age, and mortality. Linde management believes the assumptions used in the actuarial calculations are reasonable, reflect the company's experience and expectations for the future and are within accepted practices in each of the respective geographic locations in which it operates. Actual results in any given year will often differ from actuarial assumptions because of economic and other factors. The sensitivities to each of the key assumptions presented below exclude the impact of special items that occurred during the year (e.g., divestiture-related settlement charges, settlement charges resulting from change in control provisions, etc.).

The weighted-average expected long-term rates of return on pension plan assets were 7.27% for U.S. plans and 5.15% for international plans for the year ended December 31, 2019 (7.62% and 5.13%, respectively at December 31, 2018). The expected long-term rate of return on the U.S. and international plan assets is estimated based on the plans' investment strategy and asset allocation, historical capital market performance and, to a lesser extent, historical plan performance. A 0.50% change in these expected long-term rates of return, with all other variables held constant, would change Linde's pension expense by approximately $44 million.

The company has consistently used a market-related value of assets rather than the fair value at the measurement date to determine annual pension expense. The market-related value recognizes investment gains or losses over a five-year period. As a result, changes in the fair value of assets from year to year are not immediately reflected in the company's annual pension expense. Instead, annual pension expense in future periods will be impacted as deferred investment gains or losses are recognized in the market-related value of assets over the five-year period. The consolidated market-related value of assets was $8,778 million, or $158 million lower than the fair value of assets of $8,936 million at December 31, 2019. These net deferred investment losses of $158 million will be recognized in the calculation of the market-related value of assets ratably over the next four years and will impact future pension expense. Future actual investment gains or losses will impact the market-related value of assets and, therefore, will impact future annual pension expense in a similar manner.

Discount rates are used to calculate the present value of plan liabilities and pension costs and are determined annually by management. The company measures the service and interest cost components of pension and OPEB expense for significant U.S. and international plans using the spot rate approach. U.S. plans that do not use the spot rate approach continue to determine discount rates by using a cash flow matching model provided by the company's independent actuaries. The model includes a portfolio of corporate bonds graded Aa or better by at least half of the ratings agencies and matches the U.S. plans' projected cash flows to the calculated spot rates. Discount rates for the remaining international plans are based on market yields for high-quality fixed income investments representing the approximate duration of the pension liabilities on the measurement date. Refer to Note 18 to the consolidated financial statements for a summary of the discount rates used to calculate plan liabilities and benefit costs, and to the Retirement Benefits section of the Consolidated Results and Other Information section of this MD&A for a further discussion of 2019 benefit costs. A 0.50% reduction in discount rates, with all other variables held constant, would increase Linde's pension expense by approximately $29 million whereas a 0.50% increase in discount rates would result in a decrease of $25 million. A 0.50% reduction in discount rates would increase the PBO by approximately $976 million whereas a 0.50% increase in discount rates would have a favorable impact to the PBO of approximately $855 million.

The weighted-average expected rate of compensation increase was 3.25% for U.S. plans and 2.46% for international plans at December 31, 2019 (3.25% and 2.38%, respectively, at December 31, 2018). The estimated annual compensation increase is determined by management every year and is based on historical trends and market indices. A 0.50% change in the expected rate of compensation increase, with all other variables held constant, would change Linde's pension expense by approximately $8 million and would impact the PBO by approximately $65 million.

Asset Impairments

Goodwill and Other Indefinite-Lived Intangibles Assets

At December 31, 2019, the company had goodwill of $27,019 million and $1,870 million of other indefinite-lived intangible assets. Goodwill represents the aggregate of the excess consideration paid for acquired businesses over the fair value of the net assets acquired. Indefinite-lived other intangibles relate to the Linde name.

The company performs a goodwill impairment test annually or more frequently if events or circumstances indicate that an impairment loss may have been incurred. During the fourth quarter of fiscal year 2019, the company changed the date of its annual goodwill impairment test from April 30 to October 1. The change was made to more closely align the impairment testing date with the company's planning process. The change in annual impairment testing date did not delay, accelerate or avoid an impairment charge. The company has determined this change in the method of applying an accounting principle is preferable.

The impairment tests performed during the second and fourth quarters of 2019 indicated no impairment. At December 31, 2019, Linde's enterprise value was approximately $125 billion (outstanding shares multiplied by the year-end stock price plus net debt, and without any control premium) while its total capital was approximately $63 billion.

The impairment test allows an entity to first assess qualitative factors to determine if it is more likely than not that the fair value of a reporting unit is less than carrying value. If it is determined that it is more likely than not that the fair value of a reporting unit is less than carrying value then the company will estimate and compare the fair value of its reporting units to their carrying value, including goodwill. Reporting units are determined based on one level below the operating segment level. In estimating the fair value of each reporting unit, management applied a multiple of earnings from a peer group to the company's forecasted earnings for the year ending December 31, 2019. The peer group is comprised of comparable entities with similar operations and economic characteristics.

Such analysis requires the use of certain market assumptions and discount factors, which are subjective in nature. As applicable, estimated values can be affected by many factors beyond the company's control such as business and economic trends, government regulation, and technological changes. Management believes that the quantitative and qualitative factors used to perform its annual goodwill impairment assessment are appropriate and reasonable. Although the 2019 assessment indicated that it is more likely than not that the fair value of each reporting unit exceeded its carrying value, changes in circumstances or conditions affecting this analysis could have a significant impact on the fair value determination, which could then result in a material impairment charge to the company's results of operations. Reporting units with greater concentration of Linde AG assets fair valued during the recent merger are at greater risk of impairment in future periods.

Other indefinite-lived intangible assets from Linde AG recently fair valued are evaluated for impairment on an annual basis or more frequently if events and circumstances indicate that an impairment loss may have been incurred, and no impairments were indicated.

See Notes 3, 11 and 12 to the consolidated financial statements.

Long-Lived Assets

Long-lived assets, including property, plant and equipment and finite-lived other intangible assets, are tested for impairment whenever events or changes in circumstances indicate that the carrying amount of an individual asset or asset group may not be recoverable. For purposes of this test, asset groups are determined based upon the lowest level for which there are independent and identifiable cash flows. Based upon Linde's business model, for property, plant and equipment an asset group may be a single plant and related assets used to support on-site, merchant and packaged gas customers. Alternatively, the asset group may be a pipeline complex which includes multiple interdependent plants and related assets connected by pipelines within a geographic area used to support the same distribution methods.

Income Taxes

At December 31, 2019, Linde had deferred tax assets of $2,179 million (net of valuation allowances of $222 million), and deferred tax liabilities of $8,825 million. At December 31, 2019, uncertain tax positions totaled $472 million (see Notes 2 and 7 to the consolidated financial statements). Income tax expense was $769 million for the year ended December 31, 2019, or about 26.3% of pre-tax income (see Note 7 to the consolidated financial statements for additional information related to taxes).

In the preparation of consolidated financial statements, Linde estimates income taxes based on diverse legislative and regulatory structures that exist in various jurisdictions where the company conducts business. Deferred income tax assets and liabilities represent tax benefits or obligations that arise from temporary differences due to differing treatment of certain items for accounting and income tax purposes. Linde evaluates deferred tax assets each period to ensure that estimated future taxable income will be sufficient in character (e.g. capital gain versus ordinary income treatment), amount and timing to result in their recovery. A valuation allowance is established when management determines that it is more likely than not that a deferred tax asset will not be realized to reduce the assets to their realizable value. Considerable judgments are required in establishing deferred tax valuation allowances and in assessing exposures related to tax matters. As events and circumstances change, related reserves and valuation allowances are adjusted to income at that time. Linde’s tax returns are subject to audit and local taxing authorities could challenge the company’s tax positions. The company’s practice is to review tax filing positions by jurisdiction and to record provisions for uncertain income tax positions, including interest and penalties when applicable. Linde believes it records and/or discloses such potential tax liabilities as appropriate and has reasonably estimated its income tax liabilities and recoverable tax assets. If new information becomes available, adjustments are charged or credited against income at that time. Management does not anticipate that such adjustments would have a material adverse effect on the company’s consolidated financial position or liquidity; however, it is possible that the final outcomes could have a material impact on the company’s reported results of operations.

Contingencies

The company accrues liabilities for non-income tax contingencies when management believes that a loss is probable and the amounts can be reasonably estimated, while contingent gains are recognized only when realized or realizable. If new information becomes available or losses are sustained in excess of recorded amounts, adjustments are charged against income at that time. Management does not anticipate that in the aggregate such losses would have a material adverse effect on the company’s consolidated financial position or liquidity; however, it is possible that the final outcomes could have a material impact on the company’s reported results of operations.

Linde is subject to various claims, legal proceedings and government investigations that arise from time to time in the ordinary course of business. These actions are based upon alleged environmental, tax, antitrust and personal injury claims, among others (see Note 19 to the consolidated financial statements). Such contingencies are significant and the accounting requires considerable management judgments in analyzing each matter to assess the likely outcome and the need for establishing appropriate liabilities and providing adequate disclosures. Linde believes it records and/or discloses such contingencies as appropriate and has reasonably estimated its liabilities.

NEW ACCOUNTING STANDARDS

See Note 2 to the consolidated financial statements for information concerning new accounting standards and the impact of the implementation of these standards on the company’s financial statements.

FAIR VALUE MEASUREMENTS

Linde does not expect changes in the aggregate fair value of its financial assets and liabilities to have a material impact on the consolidated financial statements. See Note 15 to the consolidated financial statements.

SUPPLEMENTAL PRO FORMA INCOME STATEMENT INFORMATION

To assist with a discussion of the 2019 and 2018 results on a comparable basis, certain supplemental unaudited pro forma income statement information is provided on both a consolidated and segment basis (referred to as "pro forma Income Statement Information" or "pro forma information").

The pro forma information has been prepared on a basis consistent with Article 11 of Regulation S-X, assuming the merger and the merger-related divestitures had been consummated on January 1, 2018 and includes adjustments for (1) the preliminary purchase accounting impacts of the merger, including increased amortization expense on acquired intangible assets, increased depreciation on property, plant and equipment and lower interest expense due to revaluing existing debt to fair value, (2) conversion to US GAAP from IFRS for Linde AG, (3) accounting policy alignment, (4) the elimination of the impact of transactions between Praxair and Linde AG, (5) the elimination of the effect of events that are directly attributable to the Merger Agreement and (6) the elimination of the effect of consummated and probable divestitures required as a condition of the approval for the merger. In preparing this pro forma information, the historical financial information has been adjusted to give effect to pro forma Adjustments that are (i) directly attributable to the business combination and other transactions presented herein, such as the merger-related divestitures, (ii) factually supportable, and (iii) expected to have a continuing impact on the combined entity's consolidated results.

The pro forma information is based on management's assumptions and is presented for illustrative purposes and does not purport to represent what the results of operations would actually have been if the merger and merger-related divestitures had occurred as of the dates indicated or what the results would be for any future periods. Also, the pro forma information does not include the impact of any revenue, cost or other operating synergies that may result from the merger or any related restructuring costs. Events that are not expected to have a continuing impact on the combined results (e.g. inventory step-up costs, non-recurring income/charges) are excluded from the unaudited pro forma information.

The unaudited pro forma income statement has been presented for informational purposes only and is not necessarily indicative of what Linde's results of operation actually would have been had the merger been completed on January 1, 2018. In addition, the unaudited pro forma income statement does not purport to project the future operating results of the company.

The pro forma Income Statement Information are included in the following schedules:

- Year ended December 31, 2019 pro forma Income Statement Information

- Year ended December 31, 2018 pro forma Income Statement Information

Refer to an earlier section in this MD&A titled "*Merger of Praxair, Inc. and Linde AG"*.

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YEAR TO DATE DECEMBER 31, 2019 PRO FORMA INCOME STATEMENT INFORMATION

(Millions of dollars, except per share data)
(UNAUDITED)

	Linde plc Reported	Pro forma Adjustments: Divestitures (a)	Pro forma Adjustments: Other		Pro forma Adjustments: Total	Pro Forma
Sales	$ 28,228	$ (65)	$ —		$ (65)	$ 28,163
Cost of sales, exclusive of depreciation	16,644	(48)	(12)	(b)	(60)	16,584
Selling, general and administrative	3,457	(1)			(1)	3,456
As a % of Sales	12.2 %					12.3 %
Depreciation and amortization	4,675				—	4,675
Research and development	184				—	184
Cost reduction programs and other charges	567		(190)	(c)	(190)	377
Net gain on sale of businesses	164		(164)	(d)	(164)	—
Other income (expense) - net	68				—	68
Operating profit	2,933	(16)	38		22	2,955
Operating margin	10.4 %					10.5 %
Net pension and OPEB cost (benefit), excluding service costs	(32)		(97)	(e)	(97)	(129)
Interest expense - net	38				—	38
Income taxes	769	(5)	(15)	(f)	(20)	749
Effective Tax Rate	26.3 %					24.6 %
Income from equity investments	114				—	114
Noncontrolling interests from continuing operations	(89)				—	(89)
Income from continuing operations	$ 2,183	$ (11)	$ 150		$ 139	$ 2,322
Diluted shares outstanding	545,170				545,170	545,170
Diluted EPS from continuing operations	$ 4.00				$ 0.25	$ 4.25
SEGMENT SALES						
Americas	$ 10,993	$ (4)	$ —		$ (4)	$ 10,989
EMEA	6,643				—	6,643
APAC	5,839	(60)			(60)	5,779
Engineering	2,799				—	2,799
Other	1,954	(1)			(1)	1,953
Segment sales	$ 28,228	$ (65)	$ —		$ (65)	$ 28,163
SEGMENT OPERATING PROFIT						
Americas	$ 2,578	$ (1)	$ —		$ (1)	$ 2,577
EMEA	1,367					1,367
APAC	1,198	(14)			(14)	1,184
Engineering	390					390
Other	(245)	(1)			(1)	(246)
Segment operating profit	5,288	(16)	—		(16)	5,272
Cost reduction programs and other charges	(567)				—	(567)
Net gain on sale of businesses	164				—	164
Purchase accounting impacts - Linde AG	(1,952)				—	(1,952)
Total operating profit	$ 2,933	$ (16)	$ —		$ (16)	$ 2,917

2019 Pro forma adjustments

(a) To eliminate the results of Praxair's merger-related divestitures.

(b) To eliminate the impact of the inventory step-up recorded in purchase accounting for the merger. This item is nonrecurring in nature, directly attributable to the merger and occurred within one year of the transaction.

(c) To eliminate the transaction costs and other charges related to the merger. These transaction costs are nonrecurring, directly attributable to the merger, and incremental. See Note 5 to the consolidated financial statements.

(d) To eliminate the gain on merger related divestitures.

(e) To eliminate pension settlement charges related to the merger.

(f) To eliminate the income tax impacts of Other adjustments.

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YEAR TO DATE DECEMBER 31, 2018 PRO FORMA INCOME STATEMENT INFORMATION

(Millions of dollars, except per share data)
(UNAUDITED)

			Pro forma Adjustments						
	Linde plc (a)	Linde AG (b)	Divestitures (c)	Purchase Accounting (d)	Other		Total		Pro Forma Linde plc
Sales	$ 14,836	$ 16,929	$ (3,598)	$ —	$ (83)	(e)	$ 13,248		$ 28,084
Cost of sales, exclusive of depreciation	9,020	10,515	(2,155)	—	(451)	(e)	7,909		16,929
Selling, general and administrative	1,629	2,370	(364)	—	—		2,006		3,635
As a % of Sales	11.0 %								12.9 %
Depreciation and amortization	1,830	1,570	(337)	1,861	—		3,094		4,924
Research and development	113	88	—	—	—		88		201
Cost reduction programs and other charges	309	323	—	—	(576)	(f)	(253)		56
Other income (expense) - net	3,312	204	—	—	(3,294)	(j)	(3,090)		222
Operating profit	5,247	2,267	(742)	(1,861)	(2,350)		(2,686)		2,561
Operating margin	35.4 %								9.1 %
Net pension and OPEB cost (benefit), excluding service costs	(4)	(159)	(2)	—	—		(161)		(165)
Interest expense - net	202	332	(72)	(83)	—		177		379
Income taxes	817	634	(87)	(430)	(264)	(g)	(147)		670
Effective Tax Rate	16.2 %								28.5 %
Income from equity investments	56	80	(31)	(53)	—		(4)		52
Noncontrolling interests from continuing operations	(15)	(144)	19	140	—		15		—
Income from continuing operations	$ 4,273	$ 1,396	$ (593)	$ (1,261)	$ (2,086)		$ (2,544)		$ 1,729
Diluted shares outstanding	334,127						221,024	(h)	555,151
Diluted EPS from continuing operations	$ 12.79						$ (9.68)	(h)	$ 3.11
SEGMENT SALES									
Americas	$ 8,017	$ 4,352	$ (1,768)		$ (62)	(e)	$ 2,522		$ 10,539
EMEA	2,644	5,809	(1,463)		1	(e)	4,347		6,991
APAC	2,446	3,851	(329)		(18)	(e)	3,504		5,950
Engineering	459	2,333	—		—	(e)	2,333		2,792
Other	1,270	584	(38)		(4)	(e)	542		1,812
Segment sales	$ 14,836	$ 16,929	$ (3,598)	$ —	$ (83)		$ 13,248		$ 28,084
SEGMENT OPERATING PROFIT									
Americas	$ 2,053	$ 714	$ (327)		$ (7)	(i)	$ 380		$ 2,433
EMEA	481	1,230	(324)		(43)	(i)	863		1,344
APAC	465	686	(82)		(40)	(i)	564		1,029
Engineering	14	276	—		(5)	(i)	271		285
Other	(37)	(316)	(9)		67	(i)	(258)		(295)
Segment operating profit	2,976	2,590	(742)		(28)		1,820		4,796
Cost reduction programs and other charges	(309)	(323)			632		309		—
Gain on sale of businesses	3,294				(3,294)		(3,294)		—
Purchase accounting impacts - Linde AG	(714)				714		714		—
Total operating profit	$ 5,247	$ 2,267	$ (742)		$ (1,976)		$ (451)		$ 4,796

2018 Pro forma adjustments

(a) To include Linde plc consolidated results for the year ended December 31, 2018. Note that the results include the performance of Praxair's European industrial gases business through December 3, 2018 and the results of Linde AG from October 31, 2018 (merger date) through December 31, 2018. The adjustments reflect reclassifications to conform to Linde plc's reporting format.

(b) To include Linde AG consolidated results for the period prior to the merger date at October 31, 2018. The adjustments reflect reclassifications to conform to Linde plc's reporting format and adjustments from IFRS to U.S. GAAP.

(c) To eliminate the results of merger-related divestitures required by regulatory authorities to secure approval for the Merger. These divestitures include the majority of Praxair's European industrial gases business (completed December 3, 2018), a significant portion of Linde AG's America's industrial gases business (completed on March 1, 2019), select assets of Linde AG's South Korean industrial gases business (completed April 30, 2019), as well as certain divestitures of other Praxair and Linde AG businesses in Asia.

(d) To include purchase accounting adjustments for the period from January 1, 2018 to October 30, 2018 (prior to the Merger). This relates to (i) additional depreciation and amortization related to the increased value of of property, plant and equipment and increased basis of intangible assets, (ii) interest expense impacts related to the fair value of debt, (iii) the tax impacts related to the non-GAAP adjustments above, (iv) income from equity investments equity related to the fair value of equity investments, and (v) noncontrolling interests adjustments related to the fair value adjustments above. Purchase accounting impacts are not included in the definition of segment operating profit; therefore, no pro forma adjustment is required for segment reporting.

(e) To eliminate sales between Praxair and Linde AG for the period prior to the Merger date at October 31, 2018 (January 1, 2018 to October 30, 2018). (e) also includes a $368 million impact for the fair value step-up of inventories acquired in the merger. This charge is recorded in cost of sales and subsequently eliminated.

(f) To eliminate the transaction costs and other charges related to the Merger.

(g) To reflect the income tax impact of the above pro forma adjustments.

(h) To reflect the impact on diluted shares outstanding and diluted EPS related to ordinary shares issues to Linde AG shareholders in connection with the Merger.

(i) To eliminate other (income) charges not included in segment operating profit, primarily related to a gain on a sale of business in EMEA and a gain on a sale of asset in APAC.

(j) To eliminate the gain on merger related divestitures.

NON-GAAP FINANCIAL MEASURES

The following non-GAAP measures are intended to supplement investors' understanding of the company's financial information by providing measures which investors, financial analysts and management use to help evaluate the company's financial leverage and operating performance. Special items which the company does not believe to be indicative of on-going business performance are excluded from these calculations so that investors can better evaluate and analyze historical and future business trends on a consistent basis. Definitions of these non-GAAP measures may not be comparable to similar definitions used by other companies and are not a substitute for similar GAAP measures.

The non-GAAP measures in the following reconciliations are presented in the Selected Financial Data (Item 6) or this MD&A.

Adjusted Amounts

Certain amounts for 2019, 2018, and 2017 have been included for reference purposes and to facilitate the calculations contained herein.

(Dollar amounts in millions, except per share data)

Year Ended December 31,	**2019**	**2018**	**2017**
Adjusted Pro Forma Operating Profit and Margin			
Reported operating profit	$ 2,933	$ 5,247	$ 2,444
Pro forma adjustments (a)	22	(2,686)	N/A
Pro forma	2,955	2,561	N/A
Non-GAAP Adjustments:			
Add: Cost reduction programs and other charges	377	53	52
Less: Net gain on sale of businesses	—	(51)	—
Add: Purchase accounting impacts - Linde AG (d)	1,940	2,233	—
Total adjustments	2,317	2,235	52
Adjusted pro forma operating profit	$ 5,272	$ 4,796	N/A

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Adjusted operating profit			$ 2,496
Reported percent change	(44.1)%	114.7%	
Adjusted pro forma percent change	9.9 %	N/A	
Reported sales	$ 28,228	$ 14,836	$ 11,358
Pro forma sales (a)	28,163	28,084	N/A
Reported operating margin	10.4 %	35.4%	21.5%
Pro forma operating margin	10.5 %	9.1%	N/A
Adjusted pro forma operating margin	18.7 %	17.1%	N/A
Adjusted Pro Forma Depreciation and amortization			
Reported depreciation and amortization	$ 4,675	$ 1,830	$ 1,184
Pro forma adjustments (a)	—	3,094	N/A
Pro forma	4,675	4,924	N/A
Non-GAAP Adjustments:			
Less: Purchase accounting impacts - Linde AG (d)	(1,940)	(2,233)	—
Adjusted pro forma depreciation and amortization	$ 2,735	$ 2,691	N/A
Adjusted depreciation and amortization			$ 1,184
Adjusted Pro Forma Net pension and OPEB cost (benefit), excluding service cost			
Reported net pension and OPEB cost (benefit), excluding service cost	$ (32)	$ (4)	$ (4)
Pro forma adjustments (a)	(97)	(161)	N/A
Pro forma	(129)	(165)	N/A
Non-GAAP Adjustments:			
Add: Pension plan reorganization charge - net	(10)	(14)	(2)
Total adjustments	(10)	(14)	(2)
Adjusted pro forma Net Pension and OPEB cost (benefit), excluding service costs	$ (139)	$ (179)	N/A
Adjusted Net Pension and OPEB cost (benefit), excluding service costs			$ (6)
Adjusted Pro Forma Interest Expense - Net			
Reported interest expense - net	$ 38	$ 202	$ 161
Pro forma adjustments (a)	—	177	N/A
Pro forma	38	379	N/A
Non-GAAP Adjustments:			
Less: Bond redemption	—	(26)	—
Less: Loss on hedge portfolio unwind	—	(174)	—
Add: Purchase accounting impacts - Linde AG (d)	96	100	—
Total adjustments	96	(100)	—
Adjusted pro forma interest expense - net	$ 134	$ 279	N/A
Adjusted interest expense - net			$ 161

Adjusted Pro Forma Income Taxes(b)

Reported income taxes	$ 769	$ 817	$ 1,026
Pro forma adjustments (a)	(20)	(147)	N/A
Pro forma	749	670	N/A
Non-GAAP Adjustments:			

Add: Bond redemption	—	6	—
Add: Pension settlement charge	—	3	1
Add: Purchase accounting impacts - Linde AG (d)	447	516	—
Add: Cost reduction programs and other charges	71	(1)	4
Add: Tax reform	—	17	(394)
Total adjustments	518	541	(389)
Adjusted pro forma income taxes	$ 1,267	$ 1,211	N/A
Adjusted income taxes			$ 637
Adjusted Pro Forma Effective Tax Rate (b)			
Reported income before income taxes and equity investments	$ 2,927	$ 5,049	$ 2,287
Pro forma adjustments (a)	119	(2,702)	N/A
Pro forma	3,046	2,347	N/A
Non-GAAP Adjustments:			
Add: Bond redemption	—	26	—
Add: Pension settlement charge	—	14	2
Add: Purchase accounting impacts - Linde AG (d)	1,844	2,133	—
Add: Cost reduction programs and other charges	377	53	52
Add: Pension plan reorganization charge - net	10	—	—
Add: Loss on hedge portfolio unwind	—	174	—
Less: Net gain on sale of businesses	—	(51)	—
Total adjustments	2,231	2,349	54
Adjusted pro forma income before income taxes and equity investments	$ 5,277	$ 4,696	N/A
Adjusted income before income taxes and equity investments			$ 2,341
Reported income taxes	$ 769	$ 817	$ 1,026
Reported effective tax rate	26.3 %	16.2 %	44.9 %
Adjusted pro forma income taxes	$ 1,267	$ 1,211	N/A
Adjusted income taxes			$ 637
Adjusted pro forma effective tax rate	24.0 %	25.8 %	N/A
Adjusted effective tax rate			27.2 %
Income from Equity Investments			
Reported income from equity investments	$ 114	$ 56	$ 47
Pro forma adjustments (a)	—	(4)	N/A
Pro forma	114	52	N/A
Non-GAAP Adjustments:			
Add: Purchase accounting impacts - Linde AG (d)	57	64	—
Total adjustments	57	64	—
Adjusted pro forma income from equity investments	$ 171	$ 116	N/A
Adjusted income from equity investments			$ 47
Adjusted Noncontrolling Interests from Continuing Operations			

Reported noncontrolling interests from continuing operations	$ (89)	$ (15)	$ (61)
Pro forma adjustments (a)	—	15	N/A
Pro forma	(89)	—	N/A
Non-GAAP adjustments:			
Add: Cost reduction programs and other charges	(35)	—	—

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Add: Purchase accounting impacts - Linde AG (d)	(54)	(168)	—
Total adjustments	(89)	(168)	—
Adjusted pro forma noncontrolling interests from continuing operations	$ (178)	$ (168)	N/A
Adjusted noncontrolling interests from continuing			$ (61)
Adjusted Income from Continuing Operations (c)			
Reported income from continuing operations	$ 2,183	$ 4,273	$ 1,247
Pro forma adjustments (a)	139	(2,544)	N/A
Pro forma	2,322	1,729	N/A
Non-GAAP adjustments:			
Add: Pension settlement charge	—	11	1
Add: Cost reduction programs and other charges	281	53	48
Less: Net gain on sale of business	—	(50)	—
Add: Bond Redemption	—	20	—
Add: Loss on hedge portfolio unwind	—	174	—
Less: Other tax charges	—	(17)	394
Add: Purchase accounting impacts - Linde AG	1,400	1,513	—
Total adjustments	1,681	1,704	443
Adjusted pro forma income from continuing operations	$ 4,003	$ 3,433	N/A
Adjusted income from continuing operations			$ 1,690
Adjusted Pro Forma Diluted EPS from Continuing Operations (c)			
Reported diluted EPS from continuing operations	$ 4.00	$ 12.79	$ 4.32
Pro forma adjustments (a)	0.25	(9.68)	N/A
Pro forma	4.25	3.11	N/A
Non-GAAP adjustments:			
Add: Pension settlement charge	—	0.03	—
Add: Cost reduction programs and other charges	0.52	0.09	0.17
Less: Net gain on sale of business	—	(0.09)	—
Add: Bond redemption	—	0.04	—
Add: Loss on hedge portfolio unwind	—	0.31	—
Less Income tax reform	—	(0.03)	1.36
Add: Purchase accounting impacts - Linde AG	2.57	2.73	—
Total adjustments	3.09	3.08	1.53
Adjusted pro forma diluted EPS from continuing operations	$ 7.34	$ 6.19	N/A
Adjusted diluted EPS from continuing operations			$ 5.85
Adjusted Pro Forma EBITDA and % of Sales			
Income from continuing operations	$ 2,183	$ 4,273	$ 1,247
Add: Noncontrolling interests related to continuing operations	89	15	61
Add: Net pension and OPEB cost (benefit), excluding service cost	(32)	(4)	(4)
Add: Interest expense	38	202	161
Add: Income taxes	769	817	1,026
Add: Depreciation and amortization	4,675	1,830	1,184
EBITDA from continuing operations	7,722	7,133	3,675

Pro forma adjustments (a)			
Add: Linde AG consolidated results	—	3,917	N/A
Add: Purchase accounting impacts - Linde AG	12	315	N/A

Add: Cost reduction programs and other charges	190	576	N/A
Less: Net gain on sale of businesses	(164)	(3,294)	N/A
Less: Divestitures	(16)	(1,110)	N/A
Pro forma adjustments	22	404	N/A
Pro forma EBITDA from continuing operations	7,744	7,537	N/A
Non-GAAP adjustments:			
Less: Net gain on sale of business	—	(51)	—
Add: Cost reduction programs and other charges	377	53	52
Add: Purchase accounting impacts - Linde AG	57	64	—
Total adjustments	434	66	52
Adjusted pro forma EBITDA from continuing operations	$ 8,178	$ 7,603	N/A
Adjusted EBITDA from continuing operations			$ 3,727

Reported sales	$ 28,228	$ 14,836	$ 11,358
Pro forma sales	$ 28,163	$ 28,084	N/A
% of sales			
EBITDA from continuing operations	27.4 %	48.1 %	32.4 %
Pro forma EBITDA from continuing operations	27.5 %	26.8 %	N/A
Adjusted pro forma EBITDA from continuing operations	29.0 %	27.1 %	N/A
Adjusted EBITDA from continuing operations			32.8 %

(a) See pro forma Income Statement Information in the preceding sections.

(b) The income tax expense (benefit) on the non-GAAP pre-tax adjustments was determined using the applicable tax rates for the jurisdictions that were utilized in calculating the GAAP income tax expense (benefit) and included both current and deferred income tax amounts.

(c) Net of income taxes which are shown separately in “Adjusted Income Taxes and Effective Tax Rate”.

(d) The company believes that its non-GAAP measures excluding Purchase accounting impacts - Linde AG are useful to investors because: (i) the business combination was a merger of equals in an all-stock merger transaction, with no cash consideration, (ii) the company is managed on a geographic basis and the results of certain geographies are more heavily impacted by purchase accounting than others, causing results that are not comparable at the reportable segment level, therefore, the impacts of purchasing accounting adjustments to each segment vary and are not comparable within the company and when compared to other companies in similar regions, (iii) business management is evaluated and variable compensation is determined based on results excluding purchase accounting impacts, and; (iv) it is important to investors and analysts to understand the purchase accounting impacts to the financial statements.

A summary of each of the adjustments made for Purchase accounting impacts - Linde AG are as follows:

Adjusted Operating Profit and Margin: The purchase accounting adjustments for the year ended December 31, 2019 include (i) a $12 million adjustment for the increase in cost of sales related to the fair value step up of inventories acquired in the merger (included as a pro forma adjustment), and (ii) $1,940 in depreciation and amortization related to the fair value step up of fixed assets and intangible assets (primarily customer related) acquired in the merger.

Adjusted Interest Expense - Net: Relates to the amortization of the fair value of debt acquired in the merger.

Adjusted Income Taxes and Effective Tax Rate: Relates to the current and deferred income tax impact on the adjustments discussed above. The income tax expense (benefit) on the non-GAAP pre-tax adjustments was determined using the applicable tax rates for the jurisdictions that were utilized in calculating the GAAP income tax expense (benefit) and included both current and deferred income tax amounts.

Adjusted Income from Equity Investments: Represents the amortization of increased fair value on equity investments related to depreciable and amortizable assets.

Adjusted Noncontrolling Interests from Continuing Operations: Represents the noncontrolling interests’ ownership portion of the adjustments described above determined on an entity by entity basis.

Net Debt and Adjusted Net Debt

Net debt is a financial liquidity measure used by investors, financial analysts and management to evaluate the ability of a company to repay its debt. Purchase accounting impacts have been excluded as they are non-cash and do not have an impact on liquidity.

	December 31, 2019	December 31, 2018
(Millions of dollars)		
Debt	$ 13,956	$ 15,296
Less: cash and cash equivalents	(2,700)	(4,466)
Net debt	11,256	10,830
Less: purchase accounting impacts - Linde AG	(195)	(291)
Adjusted net debt	$ 11,061	$ 10,539

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ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Linde is exposed to market risks relating to fluctuations in interest rates and currency exchange rates. The objective of financial risk management at Linde is to minimize the negative impact of interest rate and foreign exchange rate fluctuations on the company's earnings, cash flows and equity.

To manage these risks, Linde uses various derivative financial instruments, including interest-rate swaps, treasury rate locks, currency swaps, forward contracts, and commodity contracts. Linde only uses commonly traded and non-leveraged instruments. These contracts are entered into primarily with major banking institutions thereby minimizing the risk of credit loss. Also, see Notes 2 and 14 to the consolidated financial statements for a more complete description of Linde's accounting policies and use of such instruments.

The following discussion presents the sensitivity of the market value, earnings and cash flows of Linde's financial instruments to hypothetical changes in interest and exchange rates assuming these changes occurred at December 31, 2019. The range of changes chosen for these discussions reflects Linde's view of changes which are reasonably possible over a one-year period. Market values represent the present values of projected future cash flows based on interest rate and exchange rate assumptions.

Interest Rate Risk

At December 31, 2019, Linde had debt totaling $13,956 million ($15,296 million at December 31, 2018). For fixed-rate instruments, interest rate changes affect the fair market value but do not impact earnings or cash flows. Conversely, for floating-rate instruments, interest rate changes generally do not affect the fair market value of the instrument but impact future earnings and cash flows, assuming that other factors are held constant. At December 31, 2019, including the impact of derivatives, Linde had fixed-rate debt of $10,799 million and floating-rate debt of $3,157 million, representing 77% and 23%, respectively, of total debt. At December 31, 2018, Linde had fixed-rate debt of $12,565 million and floating-rate debt of $2,731 million, representing 82% and 18%, respectively, of total debt.

Fixed Rate Debt

In order to mitigate interest rate risk, when considered appropriate interest-rate swaps are entered into as hedges of underlying financial instruments to effectively change the characteristics of the interest rate without actually changing the underlying financial instrument. At December 31, 2019, Linde had fixed-to-floating interest rate swaps outstanding that were designated as hedging instruments of the underlying debt issuances - refer to Note 14 to the consolidated financial statements for additional information. This sensitivity analysis assumes that, holding all other variables constant (such as foreign exchange rates, swaps and debt levels), a one hundred basis point increase in interest rates would decrease the unrealized fair market value of the fixed-rate debt portfolio by approximately $473 million ($594 million in 2018). A one hundred basis point increase in interest rates would result in an approximate $73 million increase to derivative assets recorded.

Variable Rate Debt

At December 31, 2019, the after-tax earnings and cash flows impact of a one hundred basis point increase in interest rates, including offsetting impact of derivatives, on the variable-rate debt portfolio would be approximately $48 million ($24 million in 2018).

Foreign Currency Risk

Linde's exchange-rate exposures result primarily from its investments and ongoing operations in Latin America (primarily Brazil, Chile and Colombia), Europe (primarily Germany, Scandinavia, and the United Kingdom), Canada, Mexico, Asia Pacific (primarily Australia, China) and other business transactions such as the procurement of equipment from foreign sources. Linde frequently utilizes currency contracts to hedge these exposures. At December 31, 2019, Linde had a notional amount outstanding of $9,713 million ($9,412 million at December 31, 2018) related to foreign exchange contracts. The majority of these were to hedge recorded balance sheet exposures, primarily intercompany loans denominated in non-functional currencies. See Note 14 to the consolidated financial statements.

Holding all other variables constant, if there were a 10% increase in foreign-currency exchange rates for the portfolio, the fair market value of foreign-currency contracts outstanding at December 31, 2019 would increase by approximately $194 million and at December 31, 2018 would decrease by approximately $307 million, which would be largely offset by an offsetting loss or gain on the foreign-currency fluctuation of the underlying exposure being hedged.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

MANAGEMENT'S STATEMENT OF RESPONSIBILITY FOR FINANCIAL STATEMENTS

Linde's consolidated financial statements are prepared by management, which is responsible for their fairness, integrity and objectivity. The accompanying financial statements have been prepared in conformity with accounting principles generally accepted in the United States of America applied on a consistent basis, except for accounting changes as disclosed, and include amounts that are estimates and judgments. All historical financial information in this annual report is consistent with the accompanying financial statements.

Linde maintains accounting systems, including internal accounting controls, monitored by a staff of internal auditors, that are designed to provide reasonable assurance of the reliability of financial records and the protection of assets. The concept of reasonable assurance is based on recognition that the cost of a system should not exceed the related benefits. The effectiveness of those systems depends primarily upon the careful selection of financial and other managers, clear delegation of authority and assignment of accountability, inculcation of high business ethics and conflict-of-interest standards, policies and procedures for coordinating the management of corporate resources, and the leadership and commitment of top management. In compliance with Section 404 of the Sarbanes-Oxley Act of 2002, Linde assessed its internal control over financial reporting and issued a report (see below).

The Audit Committee of the Board of Directors, which consists solely of non-employee directors, is responsible for overseeing the functioning of the accounting system and related controls and the preparation of annual financial statements. The Audit Committee periodically meets with management, internal auditors and the independent accountants to review and evaluate their accounting, auditing and financial reporting activities and responsibilities, including management's assessment of internal control over financial reporting. The independent registered public accounting firm and internal auditors have full and free access to the Audit Committee and meet with the committee, with and without management present.

MANAGEMENT'S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING

Linde's management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Exchange Act Rule 13a-15(f). Under the supervision and with the participation of management, including the company's principal executive officer and principal financial officer, the company conducted an evaluation of the effectiveness of its internal control over financial reporting based on the framework in *Internal Control – Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (often referred to as COSO). Based on this evaluation, management concluded that the company's internal control over financial reporting was effective as of December 31, 2019.

Linde's evaluation of internal control over financial reporting as of December 31, 2019 did not include the internal control over financial reporting related to Linde AG which was acquired by Praxair in a merger accounted for as a business combination. In connection with its antitrust review of the transaction, the U.S. Federal Trade Commission (the "FTC") imposed a Hold Separate Order (the "HSO") on Linde that was lifted on March 1, 2019 after all required asset divestitures in the U.S. were completed. The HSO required the companies to continue to operate globally as separate and independent companies apart from each other in all material respects. As such, the HSO regulatory restrictions prohibited Linde from being able to perform procedures necessary to complete an overall assessment of Linde AG's disparate internal control environment with operations in over 100 countries. Because of this, the assessment of Linde AG's internal control environment could only begin after the HSO was terminated on March 1, 2019, and as such Linde AG has been excluded from the overall Linde internal control assessment as of December 31, 2019.

Total assets and sales for Linde AG represent approximately 23% and 62%, respectively, of the related consolidated financial statement amounts as of and for the year ended December 31, 2019.

PricewaterhouseCoopers LLP, an independent registered public accounting firm, has audited and issued their opinion on the effectiveness of the company's internal control over financial reporting as of December 31, 2019 as stated in their report.

/s/ STEPHEN F. ANGEL

Stephen F. Angel
Chief Executive Officer

/s/ KELCEY E. HOYT

Kelcey E. Hoyt
Chief Accounting Officer

/s/ MATTHEW J. WHITE

Matthew J. White
Chief Financial Officer

March 2, 2020

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Shareholders of Linde plc

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Linde plc and its subsidiaries (the “Company”) as of December 31, 2019 and 2018, and the related consolidated statements of income, of comprehensive income, of equity and of cash flows for each of the three years in the period ended December 31, 2019, including the related notes (collectively referred to as the “consolidated financial statements”). We also have audited the Company's internal control over financial reporting as of December 31, 2019, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2019 and 2018, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2019 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2019, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the COSO.

Basis for Opinions

The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management’s Report on Internal Control Over Financial Reporting. Our responsibility is to express opinions on the Company’s consolidated financial statements and on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

As described in Management’s Report on Internal Control over Financial Reporting, management has excluded Linde Aktiengesellschaft ("Linde AG") from its assessment of internal control over financial reporting as of December 31, 2019 because it was acquired in a merger accounted for as a business combination during 2018 and subject to a hold separate order issued by the U.S. Federal Trade Commission until March 2019. We have also excluded Linde AG from our audit of internal control over financial reporting. Linde AG is a wholly-owned subsidiary whose total assets and total sales excluded from management’s assessment and our audit of internal control over financial reporting represent approximately 23% and 62%, respectively, of the related consolidated financial statement amounts as of and for the year ended December 31, 2019.

Definition and Limitations of Internal Control over Financial Reporting

A company’s internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current period audit of the consolidated financial statements that were communicated or required to be communicated to the audit committee and that (i) relate to accounts or disclosures that are material to the consolidated financial statements and (ii) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Revenue Recognition - Estimated Costs at Completion

As described in Note 21 to the consolidated financial statements, $2,799 million of the Company's total revenues for the year ended December 31, 2019 was generated from the sale of equipment contracts. Sale of equipment contracts are generally comprised of a single performance obligation. Revenue from sale of equipment is generally recognized over time as the Company has an enforceable right to payment for performance completed to date and performance does not create an asset with alternative use. For contracts recognized over time, revenue is recognized primarily using a cost incurred input method. Costs incurred to date relative to total estimated costs at completion are used to measure progress toward satisfying performance obligations. Costs incurred include material, labor, and overhead costs and represent work contributing and proportionate to the transfer of control to the customer.

The principal considerations for our determination that performing procedures relating to revenue recognition - estimated costs at completion is a critical audit matter are there was significant judgment by management when developing the estimated costs at completion for the sale of equipment contracts. This in turn led to a high degree of auditor judgment, subjectivity, and effort in performing procedures and evaluating audit evidence relating to the estimated costs at completion and management's significant assumptions, including the estimated expected material and labor costs. In addition, the audit effort involved the use of professionals with specialized skill and knowledge to assist in performing these procedures and evaluating the audit evidence obtained.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures also included, among others, testing management's process for developing the estimated costs at completion for the sale of equipment contracts and evaluating the reasonableness of management's significant assumptions, including the estimated expected material and labor costs. Evaluating the reasonableness of management's significant assumptions involved evaluating management's ability to reasonably estimate costs at completion for the sale of equipment contracts on a sample basis by (i) performing a comparison of the originally estimated and actual costs incurred on similar completed equipment contracts, and (ii) evaluating the timely identification of circumstances that may warrant a modification to estimated costs at completion, including actual costs in excess of estimates. Professionals with specialized skill and knowledge were used to assist in evaluating management's estimates and assumptions relating to the expected material and labor costs.

Goodwill Impairment Assessment

As described in Notes 2 and 11 to the consolidated financial statements, the Company's consolidated goodwill balance was $27,019 million as of December 31, 2019. Management performs an impairment test annually, or more frequently if events or circumstances indicate that an impairment loss may have been incurred. The impairment test allows an entity to first assess qualitative factors to determine if it is more likely than not that the fair value of a reporting unit is less than its carrying value. If it is determined that it is more likely than not that the fair value of a reporting unit is less than its carrying value then management will estimate and compare the fair value of the reporting unit to its carrying value, including goodwill. In estimating the fair value of each reporting unit, management applied a multiple of earnings from a peer group to the Company's forecasted earnings for the year ending December 31, 2019. The peer group is comprised of comparable entities with similar operations and economic characteristics.

The principal considerations for our determination that performing procedures relating to the goodwill impairment assessment is a critical audit matter are there was significant judgment by management when developing the fair value measurement of the reporting units. This in turn led to a high degree of auditor judgment, subjectivity, and effort in performing procedures and evaluating audit evidence relating to management's significant assumptions for the multiples of earnings from a peer group of comparable entities with similar operations and economic characteristics. In addition, the audit effort involved the use of professionals with specialized skill and knowledge to assist in performing these procedures and evaluating the audit evidence obtained.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to management's goodwill impairment assessment, including controls over the valuation of the Company's reporting units. These procedures also included, among others, i) testing management's process for developing the fair value measurement of the reporting units, ii) evaluating the appropriateness of the multiples of earnings model, (iii) testing the completeness, accuracy, and relevance of underlying data used in the model, and (iv) evaluating management's significant assumptions for the multiples of earnings from a peer group of comparable entities with similar operations and economic characteristics. Evaluating management's assumptions related to the multiples of earnings involved evaluating whether the assumptions used by management were reasonable considering (i) the consistency with external market and industry data and (ii) whether the assumptions were consistent with evidence obtained in other areas of the audit. Professionals with specialized skill and knowledge were used to assist in the evaluation of the Company's multiples of earnings model and significant assumptions for the multiples of earnings from a peer group of comparable entities with similar operations and economic characteristics.

/s/ PricewaterhouseCoopers LLP
Stamford, Connecticut
March 2, 2020

We have served as the Company's or its predecessor's auditor since 1992.

CONSOLIDATED STATEMENTS OF INCOME
LINDE PLC AND SUBSIDIARIES
(Dollar amounts in millions, except per share data)

Year Ended December 31,	2019	2018	2017
Sales	$ 28,228	$ 14,836	$ 11,358
Cost of sales, exclusive of depreciation and amortization	16,644	9,020	6,382
Selling, general and administrative	3,457	1,629	1,207
Depreciation and amortization	4,675	1,830	1,184
Research and development	184	113	93
Cost reduction programs and other charges	567	309	52
Net gain on sale of businesses	164	3,294	—
Other income (expenses) – net	68	18	4
Operating Profit	2,933	5,247	2,444
Interest expense – net	38	202	161
Net pension and OPEB cost (benefit), excluding service cost	(32)	(4)	(4)
Income From Continuing Operations Before Income Taxes and Equity Investments	2,927	5,049	2,287
Income taxes on continuing operations	769	817	1,026
Income From Continuing Operations Before Equity Investments	2,158	4,232	1,261
Income from equity investments	114	56	47
Income From Continuing Operations (Including Noncontrolling Interests)	2,272	4,288	1,308
Income from discontinued operations, net of tax	109	117	—
Net Income (Including Noncontrolling Interests)	2,381	4,405	1,308
Less: noncontrolling interests from continuing operations	(89)	(15)	(61)
Less: noncontrolling interests from discontinued operations	(7)	(9)	—
Net Income – Linde plc	$ 2,285	$ 4,381	$ 1,247
Net Income – Linde plc			
Income from continuing operations	$ 2,183	$ 4,273	$ 1,247
Income from discontinued operations	$ 102	$ 108	$ —
Per Share Data – Linde plc Shareholders			
Basic earnings per share from continuing operations	$ 4.03	$ 12.93	$ 4.36
Basic earnings per share from discontinued operations	0.19	0.33	—
Basic earnings per share	$ 4.22	$ 13.26	$ 4.36
Diluted earnings per share from continuing operations	$ 4.00	$ 12.79	$ 4.32
Diluted earnings per share from discontinued operations	0.19	0.32	—
Diluted earnings per share	$ 4.19	$ 13.11	$ 4.32
Weighted Average Shares Outstanding (000's):			
Basic shares outstanding	541,094	330,401	286,261
Diluted shares outstanding	545,170	334,127	289,114

The accompanying Notes are an integral part of these financial statements.

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME
LINDE PLC AND SUBSIDIARIES
(Dollar amounts in millions)

Year Ended December 31,	2019	2018	2017
NET INCOME (INCLUDING NONCONTROLLING INTERESTS)	$ 2,381	$ 4,405	$ 1,308
OTHER COMPREHENSIVE INCOME (LOSS)			
Translation adjustments:			
Foreign currency translation adjustments	118	(401)	433
Reclassifications to net income (Note 4)	12	318	—
Income taxes	3	7	92
Translation adjustments	133	(76)	525
Funded status - retirement obligations (Note 18):			
Retirement program remeasurements	(852)	(260)	(39)
Reclassifications to net income	154	94	55
Income taxes	154	(55)	(5)
Funded status - retirement obligations	(544)	(221)	11
Derivative instruments (Note 14):			
Current year unrealized gain (loss)	(32)	—	—
Reclassifications to net income	—	(1)	—
Income taxes	7	—	—
Derivative instruments	(25)	(1)	—
Securities (Note 9):			
Current year unrealized gain (loss)	1	(1)	—
Reclassifications to net income	—	—	—
Income taxes	—	—	—
Securities	1	(1)	—
TOTAL OTHER COMPREHENSIVE INCOME (LOSS)	(435)	(299)	536
COMPREHENSIVE INCOME (INCLUDING NONCONTROLLING INTERESTS)	1,946	4,106	1,844
Less: noncontrolling interests	(19)	(83)	(95)
COMPREHENSIVE INCOME - LINDE PLC	$ 1,927	$ 4,023	$ 1,749

The accompanying Notes are an integral part of these financial statements.

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CONSOLIDATED BALANCE SHEETS
LINDE PLC AND SUBSIDIARIES
(Dollar amounts in millions)

December 31,	2019	2018
Assets		
Cash and cash equivalents	$ 2,700	$ 4,466
Accounts receivable – net	4,322	4,297
Contract assets	368	283
Inventories	1,697	1,651
Assets held for sale	125	5,498
Prepaid and other current assets	1,140	1,077
Total Current Assets	10,352	17,272
Property, plant and equipment – net	29,064	29,717
Equity investments	2,027	1,838
Goodwill	27,019	26,874
Other intangible assets – net	16,137	16,223
Other long-term assets	2,013	1,462
Total Assets	$ 86,612	$ 93,386
Liabilities and Equity		
Accounts payable	$ 3,266	$ 3,219
Short-term debt	1,732	1,485
Current portion of long-term debt	1,531	1,523
Contract liabilities	1,758	1,546
Accrued taxes	370	657
Liabilities of assets held for sale	2	768
Other current liabilities	3,501	3,758
Total Current Liabilities	12,160	12,956
Long-term debt	10,693	12,288
Other long-term liabilities	4,888	3,435
Deferred credits	7,236	7,611
Total Liabilities	34,977	36,290
Commitments and contingencies (Note 19)		
Redeemable noncontrolling interests	113	16
Linde plc Shareholders' Equity:		
Ordinary shares (€0.001 par value, authorized 1,750,000,000 shares, 2019 issued: 552,012,862 ordinary shares; 2018 issued: 551,310,272 ordinary shares)	1	1
Additional paid-in capital	40,201	40,151
Retained earnings	16,842	16,529
Accumulated other comprehensive income (loss)	(4,814)	(4,456)
Less: Treasury stock, at cost (2019 – 17,632,318 shares and 2018 – 4,068,642 shares)	(3,156)	(629)
Total Linde plc Shareholders' Equity	49,074	51,596
Noncontrolling interests	2,448	5,484
Total Equity	51,522	57,080
Total Liabilities and Equity	$ 86,612	$ 93,386

The accompanying Notes are an integral part of these financial statements.

CONSOLIDATED STATEMENTS OF CASH FLOWS
LINDE PLC AND SUBSIDIARIES
(Millions of dollars)

Year Ended December 31,	2019	2018	2017
Increase (Decrease) in Cash and Cash Equivalents			
Operations			
Net income – Linde plc	$ 2,285	$ 4,381	$ 1,247
Less: income from discontinued operations, net of tax and noncontrolling interests	(102)	(108)	—
Add: Noncontrolling interests from continuing operations	89	15	61
Income from continuing operations (including noncontrolling interests)	$ 2,272	$ 4,288	$ 1,308
Adjustments to reconcile net income to net cash provided by operating activities:			
Cost Reduction Programs and other charges, net of payments	(236)	40	26
Amortization of merger-related inventory step-up	12	368	—
Tax Act income tax charge, net	—	(61)	394
Depreciation and amortization	4,675	1,830	1,184
Deferred income taxes, excluding Tax Act	(303)	(187)	136
Share-based compensation	95	62	59
Net gain on sale of businesses, net of tax	(108)	(2,923)	—
Non-cash charges and other	(127)	175	43
Working capital			
Accounts receivable	80	(124)	(92)
Contract assets and liabilities, net	87	—	—
Inventory	(81)	(4)	(22)
Prepaid and other current assets	(72)	43	(66)
Payables and accruals	(174)	287	22
Pension contributions	(94)	(87)	(19)
Long-term assets, liabilities and other	93	(53)	68
Net cash provided by operating activities	6,119	3,654	3,041
Investing			
Capital expenditures	(3,682)	(1,883)	(1,311)
Acquisitions, net of cash acquired	(225)	(25)	(33)
Divestitures and asset sales, net of cash divested	5,096	5,908	30
Cash acquired in merger transaction	—	1,363	—
Net cash provided by (used for) investing activities	1,189	5,363	(1,314)
Financing			
Short-term debt borrowings (repayments) – net	224	208	(199)
Long-term debt borrowings	99	8	11
Long-term debt repayments	(1,583)	(3,124)	(583)
Issuances of ordinary shares	72	77	120
Purchases of ordinary shares	(2,658)	(599)	(12)
Cash dividends – Linde plc shareholders	(1,891)	(1,166)	(901)
Noncontrolling interest transactions and other	(3,260)	(402)	(92)
Net cash used for financing activities	(8,997)	(4,998)	(1,656)
Discontinued Operations			
Cash provided by operating activities	$ 69	$ 48	$ —
Cash used for investing activities	(60)	(23)	—
Cash provided by financing activities	5	2	—
Net cash provided by discontinued operations	14	27	—

Effect of exchange rate changes on cash and cash equivalents	(77)	(60)	22
Change in cash and cash equivalents	(1,752)	3,986	93
Cash and cash equivalents, beginning-of-period	4,466	617	524
Cash and cash equivalents, including discontinued operations	$ 2,714	$ 4,603	$ 617

Cash and cash equivalents of discontinued operations	(14)	(137)	—
Cash and cash equivalents, end-of-period	$ 2,700	$ 4,466	$ 617
Supplemental Data			
Income taxes paid	$ 1,357	$ 757	$ 565
Interest paid, net of capitalized interest (Note 9)	$ 275	$ 214	$ 184

The accompanying Notes are an integral part of these financial statements.

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CONSOLIDATED STATEMENTS OF EQUITY
LINDE PLC AND SUBSIDIARIES
(Dollar amounts in millions, except per share data, shares in thousands)

	Linde plc Shareholders' Equity									
	Ordinary shares					Treasury Stock				
Activity	Shares	Amounts	Additional Paid-in Capital	Retained Earnings	Accumulated Other Comprehensive Income (Loss) (Note 9)	Shares	Amounts	Linde plc Shareholders' Equity	Noncontrolling Interests	Total Equity
Balance, December 31, 2016	383,231	$ 4	$ 4,074	$ 12,879	$ (4,600)	98,330	$(7,336)	$ 5,021	$ 420	$ 5,441
Net Income				1,247				1,247	59	1,306
Other comprehensive income (loss)					502			502	34	536
Noncontrolling interests:										
Dividends and other capital reductions								—	(35)	(35)
Additions (Reductions)								—	15	15
Redemption value adjustments (Note 16)				(1)				(1)		(1)
Dividends ($3.15 per common share)				(901)				(901)		(901)
Issuances of common stock:										
For the dividend reinvestment and stock purchase plan						(50)	7	7		7
For employee savings and incentive plans			(49)			(1,835)	134	85		85
Purchases of common stock						9	(1)	(1)		(1)
Share-based compensation			59					59		59
Balance, December 31, 2017	383,231	$ 4	$ 4,084	$ 13,224	$ (4,098)	96,454	$(7,196)	$ 6,018	$ 493	$ 6,511
Net Income				4,381				4,381	21	4,402
Other comprehensive income (loss)					(265)			(265)	59	(206)
Noncontrolling interests:										
Dividends and other capital reductions								—	(49)	(49)
Additions (Reductions)			(127)					(127)	(186)	(313)
Redemption value adjustments (Note 16)				(3)				(3)		(3)
Dividends ($3.30 per common share)				(1,166)				(1,166)		(1,166)

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	Linde plc Shareholders' Equity									
	Ordinary shares					Treasury Stock				
Activity	Shares	Amounts	Additional Paid-in Capital	Retained Earnings	Accumulated Other Comprehensive Income (Loss) (Note 9)	Shares	Amounts	Linde plc Shareholders' Equity	Noncontrolling Interests	Total Equity
Issuances of common stock:										
For the dividend reinvestment and stock purchase plan						(31)	5	5		5
For employee savings and incentive plans	255	—	(46)			(1,109)	79	33		33
Purchases of common stock						4,079	(630)	(630)		(630)
Share-based compensation			62					62		62
Tax Act Reclassification (Note 7)				$ 93	$ (93)			$ —		$ —
Impact of merger (Notes 3 and 16)	167,824	$ (3)	$ 36,178			(95,324)	$ 7,113	$ 43,288	$ 5,146	$ 48,434
Balance, December 31, 2018	551,310	$ 1	$ 40,151	$ 16,529	$ (4,456)	4,069	$ (629)	$ 51,596	$ 5,484	$ 57,080
Net Income available for Linde plc shareholders				2,285				2,285	94	2,379
Other comprehensive loss					(358)			(358)	(77)	(435)
Noncontrolling interests:										
Dividends and other capital reductions								—	(132)	(132)
Additions (Reductions) - (Note 16)								—	(2,921)	(2,921)
Redemption value adjustments (Note 16)				(8)				(8)		(8)
Dividends ($3.50 per common share)				(1,891)				(1,891)		(1,891)
Issuances of ordinary shares:										
For the dividend reinvestment and stock purchase plan										
For employee savings and incentive plans	703	—	(45)	(73)		(770)	127	9		9
Purchases of ordinary shares						14,333	(2,654)	(2,654)		(2,654)
Share-based compensation			95					95		95
Balance, December 31, 2019	552,013	$ 1	$ 40,201	$ 16,842	$ (4,814)	17,632	$(3,156)	$ 49,074	$ 2,448	$ 51,522

The accompanying Notes are an integral part of these financial statements

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
LINDE PLC AND SUBSIDIARIES

NOTE 1. FORMATION OF LINDE PLC AND BUSINESS COMBINATION OF PRAXAIR, INC. AND LINDE AG

Formation of Linde plc

Linde plc ("Linde" or "the company"), a public limited company incorporated in Ireland, was formed in accordance with the requirements of the business combination agreement, dated as of June 1, 2017, as amended (the "business combination agreement"). Pursuant to the business combination agreement, among other things, Praxair, Inc., a Delaware corporation ("Praxair"), and Linde Aktiengesellschaft, a stock corporation incorporated under the laws of Germany ("Linde AG"), agreed to combine their respective businesses through an all-stock transaction, and become subsidiaries of the company (collectively referred to as "business combination" or "merger"). On October 31, 2018, Linde completed the business combination. Prior to the business combination, the company did not conduct any business activities other than those required for its formation and matters contemplated by the business combination agreement.

Business Combination of Praxair, Inc. and Linde AG

The business combination has been accounted for using the acquisition method of accounting in accordance with the provisions of the Financial Accounting Standards Board ("FASB") Accounting Standards Codification ("ASC") 805, *"Business Combinations"*, with Praxair representing the accounting acquirer. Pursuant to Rule 12g-3(a) under the Exchange Act, as of October 31, 2018, the company became the successor issuer to Praxair. Also, the Linde shares are deemed to be registered under Section 12(b) of the Exchange Act, and the company is subject to the informational requirements of the Exchange Act and the rules and regulations promulgated thereunder. The Linde shares trade on the New York Stock Exchange ("NYSE") and the Frankfurt Stock Exchange under the ticker symbol "LIN". Prior to the business combination, the Praxair shares were registered pursuant to Section 12(b) of the Exchange Act and listed on the NYSE. In connection with the completion of the business combination, the Praxair shares were suspended from trading on the NYSE as of close of business (New York Time) on October 30, 2018. On November 1, 2018, Praxair filed a Form 25 to de-list and de-register its three series of Euro-denominated notes, including its 1.50%Notes due 2020, 1.20% Notes due 2024 and 1.625% Notes due 2025, that were listed on the NYSE. Trading of the Euro-denominated notes on the NYSE was suspended as of close of business (New York Time) on November 9, 2018, and Praxair filed a Form 15 with the SEC terminating the registration under the Exchange Act of its securities and suspending Praxair's reporting obligations under Section 15(d) of the Exchange Act.

In connection with the business combination, the company, Praxair and Linde AG entered into various agreements with regulatory authorities to satisfy anti-trust requirements to secure approval to consummate the business combination. These agreements included the sale of the majority of Praxair's European businesses (completed on December 3, 2018), the majority of Linde AG's Americas business (completed on March 1, 2019), select assets of Linde AG's South Korean industrial gases business (completed April 30, 2019), select assets of Praxair's Indian industrial gases business (completed July 12, 2019), select assets of Linde AG's Indian industrial gases business (completed December 16, 2019) as well as certain divestitures of other Praxair and Linde AG businesses in Asia that are currently expected to be sold in 2020 (collectively, the "merger-related divestitures"). See Note 4 for additional information relating to merger-related divestitures.

Additionally, to obtain merger approval in the United States Linde, Praxair and Linde AG entered into an agreement with the U.S. Federal Trade Commission ("FTC") dated October 1, 2018 ("hold separate order" or "HSO"). Under the HSO, the company, Praxair and Linde AG agreed to continue to operate Linde AG and Praxair as independent, ongoing, economically viable, competitive businesses held separate, distinct, and apart from each other's operations; and not coordinate any aspect of their operations until certain divestitures in the United States were completed. Accordingly, Linde had accounted for Linde AG as a separate segment for 2018 reporting purposes effective with the merger date. Prior to the merger date, the company's Linde AG segment did not exist. Since the FTC hold separate order restrictions were lifted effective March 1, 2019, the company subsequently implemented a new segment structure as follows: Americas, EMEA (Europe/Middle East/Africa), APAC (Asia/South Pacific) and Engineering. This new management organization structure was implemented during the first quarter 2019 and, accordingly, segment information has been retrospectively recast for all prior periods. Refer to Note 20 Segment Information for further details.

NOTE 2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Principles of Consolidation – The consolidated financial statements were prepared in conformity with accounting principles generally accepted in the United States of America (" U.S. GAAP") and include the accounts of all significant subsidiaries where control exists and, in limited situations, variable-interest entities where the company is the primary beneficiary. Intercompany transactions and balances are eliminated in consolidation and any significant related-party transactions have been disclosed.

Equity investments generally consist of 20% to 50% owned operations where the company exercises significant influence, but does not have control. Equity income from equity investments in corporations is reported on an after-tax basis. Pre-tax income from equity investments that are partnerships or limited-liability corporations ("LLC") is included in other income (expenses) – net with related taxes included in Income taxes. Equity investments are reviewed for impairment whenever events or circumstances reflect that an impairment loss may have incurred.

Changes in ownership interest that result either in consolidation or deconsolidation of an investment are recorded at fair value through earnings, including the retained ownership interest, while changes that do not result in either consolidation or deconsolidation of a subsidiary are treated as equity transactions.

Use of Estimates – The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. While actual results could differ, management believes such estimates to be reasonable.

Operations – Linde is the largest industrial gases company globally. The company produces, sells and distributes atmospheric, process and specialty gases, and high-performance surface coatings to a diverse group of industries including aerospace, chemicals, food and beverage, electronics, energy, healthcare, manufacturing, and metals. Linde's Engineering business offers its customers an extensive range of gas production and processing services including suppling plant components and services directly to customers.

Revenue Recognition – Effective January 1, 2018, Linde adopted the FASB's Accounting Standards Update No. 2014-09 ("ASC 606") relating to Revenue Recognition. Revenue is recognized as control of goods or services are transferred to customers in an amount that reflects the consideration to which an entity expects to be entitled to receive in exchange for the goods or services. See Note 21 for additional details regarding Linde's revenue recognition policies. The adoption of ASC 606 resulted in no differences in revenue recognition compared to previous policies.

Cash Equivalents – Cash equivalents are considered to be highly liquid securities with original maturities of three months or less.

Inventories – Inventories are stated at the lower of cost or net realizable value. Cost is determined using the average-cost method.

Property, Plant and Equipment – Net – Property, plant and equipment are carried at cost, net of accumulated depreciation. The company capitalizes interest as part of the cost of constructing major facilities (see Note 10). Depreciation is calculated on the straight-line method based on the estimated useful lives of the assets, which range from 3 years to 40 years (see Note 10). Linde uses accelerated depreciation methods for tax purposes where appropriate. Maintenance of property, plant and equipment is generally expensed as incurred.

The company performs a test for impairment whenever events or changes in circumstances indicate that the carrying amount of an individual asset or asset group may not be recoverable. Should projected undiscounted future cash flows be less than the carrying amount of the asset or asset group, an impairment charge reducing the carrying amount to fair value is required. Fair value is determined based on the most appropriate valuation technique, including discounted cash flows.

Asset-Retirement Obligations – An asset-retirement obligation is recognized in the period in which sufficient information exists to determine the fair value of the liability with a corresponding increase to the carrying amount of the related property, plant and equipment which is then depreciated over its useful life. The liability is initially measured at discounted fair value and then accretion expense is recorded in each subsequent period. The company's asset-retirement obligations are primarily associated with its on-site long-term supply arrangements where the company has built a facility on land leased from the customer and is obligated to remove the facility at the end of the contract term. The company's asset-retirement obligations are not material to its consolidated financial statements.

Foreign Currency Translation – For most foreign operations, the local currency is the functional currency and translation gains and losses are reported as part of the accumulated other comprehensive income (loss) component of equity as a cumulative translation adjustment (see Note 9).

Financial Instruments – Linde enters into various derivative financial instruments to manage its exposure to fluctuating interest rates, currency exchange rates, commodity pricing and energy costs. Such instruments primarily include interest-rate swap and treasury rate lock agreements; currency-swap agreements; forward contracts; currency options; and commodity-swap agreements. These instruments are not entered into for trading purposes. Linde only uses commonly traded and non-leveraged instruments.

There are three types of derivatives the company enters into: (i) those relating to fair-value exposures, (ii) those relating to cash-flow exposures, and (iii) those relating to foreign currency net investment exposures. Fair-value exposures relate to recognized assets or liabilities, and firm commitments; cash-flow exposures relate to the variability of future cash flows associated with recognized assets or liabilities, or forecasted transactions; and net investment exposures relate to the impact of foreign currency exchange rate changes on the carrying value of net assets denominated in foreign currencies.

When a derivative is executed and hedge accounting is appropriate, it is designated as either a fair-value hedge, cash-flow hedge, or a net investment hedge. Currently, Linde designates all interest-rate and treasury rate locks as hedges for accounting purposes; however, currency contracts are generally not designated as hedges for accounting purposes unless they are related to forecasted transactions. Whether designated as hedges for accounting purposes or not, all derivatives are linked to an appropriate underlying exposure. On an ongoing basis, the company assesses the hedge effectiveness of all derivatives designated as hedges for accounting purposes to determine if they continue to be highly effective in offsetting changes in fair values or cash flows of the underlying hedged items. If it is determined that the hedge is not highly effective, then hedge accounting will be discontinued prospectively.

Changes in the fair value of derivatives designated as fair-value hedges are recognized in earnings as an offset to the change in the fair values of the underlying exposures being hedged. The changes in fair value of derivatives that are designated as cash-flow hedges are deferred in accumulated other comprehensive income (loss) and are reclassified to earnings as the underlying hedged transaction affects earnings. Provided the hedge remains highly effective, any ineffectiveness is deferred in accumulated other comprehensive income (loss) and are reclassified to earnings as the underlying hedged transaction affects earnings. Hedges of net investments in foreign subsidiaries are recognized in the cumulative translation adjustment component of accumulated other comprehensive income (loss) on the consolidated balance sheets to offset translation gains and losses associated with the hedged net investment. Derivatives that are entered into for risk-management purposes and are not designated as hedges (primarily related to anticipated net income and currency derivatives other than for firm commitments) are recorded at their fair market values and recognized in current earnings.

See Note 14 for additional information relating to financial instruments.

Goodwill – Acquisitions are accounted for using the acquisition method which requires allocation of the purchase price to assets acquired and liabilities assumed based on estimated fair values. Any excess of the purchase price over the fair value of the assets and liabilities acquired is recorded as goodwill. Allocations of the purchase price are based on preliminary estimates and assumptions at the date of acquisition and are subject to revision based on final information received, including appraisals and other analyses which support underlying estimates.

The company performs a goodwill impairment test annually or more frequently if events or circumstances indicate that an impairment loss may have been incurred. During the fourth quarter of fiscal year 2019, the company changed the date of its annual goodwill impairment test from April 30 to October 1. The change was made to more closely align the impairment testing date with the company's planning process.

The impairment test allows an entity to first assess qualitative factors to determine if it is more likely than not that the fair value of a reporting unit is less than carrying value. If it is determined that it is more likely than not that the fair value of a reporting unit is less than carrying value then the company will estimate and compare the fair value of its reporting units to their carrying value, including goodwill. Reporting units are determined based on one level below the operating segment level. In estimating the fair value of each reporting unit, management applied a multiple of earnings from a peer group to the company's forecasted earnings for the year ending December 31, 2019. The peer group is comprised of comparable entities with similar operations and economic characteristics.

See Notes 3 and 11 for additional information relating to goodwill.

Other Intangible Assets – Other intangible assets, primarily customer relationships and brands/tradenames, are amortized over the estimated period of benefit. The determination of the estimated period of benefit will be dependent upon the use and underlying characteristics of the intangible asset. Linde evaluates the recoverability of its intangible assets subject to amortization when facts and circumstances indicate that the carrying value of the asset may not be recoverable. If the carrying value is not recoverable, impairment is measured as the amount by which the carrying value exceeds its estimated fair value. Fair value is generally estimated based on either appraised value or other valuation techniques. Indefinite lived intangible assets related to the Linde brand are evaluated for impairment on an annual basis or more frequently if events or circumstances indicate an impairment loss may have occurred.

See Notes 3 and 12 for additional information relating to other intangible assets.

Assets Held for Sale and Discontinued Operations – Assets held for sale, as well as liabilities directly related to these assets, are classified separately in the consolidated balance sheets as held for sale if the requirements of the FASB's Accounting Standards Codification ("ASC") 360, *Property, Plant and Equipment*, are satisfied. The main requirements of

ASC 360 are: (i) management having the authority to approve the action has committed to a plan to sell the assets and an active program to locate a buyer has been initiated, (ii) the assets are available for sale in their present condition at a reasonable market price, and (iii) a sale within the next twelve months is probable. Assets classified as held for sale are measured at the lower of carrying amount and fair value less costs to sell. Amortization and depreciation has been discontinued. The process involved in determining the fair value less costs to sell involves estimates and assumptions that are subject to uncertainty.

Discontinued operations are reported as soon as a business is classified as held for sale, or has already been disposed of, and when the business to be disposed of represents a strategic shift that has (or will have) a major effect on the company's operations and financial results. Businesses acquired with the intent of divesting are also required to be reported as discontinued operations. The profit/loss from discontinued operations is reported separately from the expenses and income from continuing operations in the consolidated statements of income. In the consolidated statement of cash flows, the cash flows from discontinued operations are shown separately from the cash flows from continuing operations. The information provided in the Notes relates to continuing operations. If the information relates exclusively to discontinued operations, this is highlighted accordingly.

See Note 4 for additional information relating to assets held for sale and discontinued operations.

Income Taxes – Deferred income taxes are recorded for the temporary differences between the financial statement and tax bases of assets and liabilities using currently enacted tax rates. Valuation allowances are established against deferred tax assets whenever circumstances indicate that it is more likely than not that such assets will not be realized in future periods.

Under the guidance for accounting for uncertainty in income taxes, the company can recognize the benefit of an income tax position only if it is more likely than not (greater than 50%) that the tax position will be sustained upon tax examination, based solely on the technical merits of the tax position. Otherwise, no benefit can be recognized. The tax benefits recognized are measured based on the largest benefit that has a greater than 50% likelihood of being realized upon ultimate settlement. Additionally, the company accrues interest and related penalties, if applicable, on all tax exposures for which reserves have been established consistent with jurisdictional tax laws. Interest and penalties are classified as income tax expense in the financial statements.

See Note 7 for additional information relating to income taxes, including the U.S. Tax Cuts and Jobs Act enacted in December 2017.

Retirement Benefits – Most Linde employees participate in a form of defined benefit or contribution retirement plan, and additionally certain employees are eligible to participate in various post-employment health care and life insurance benefit plans. The cost of contribution plans is recognized in the year earned while the cost of other plans is recognized over the employees' expected service period to the company, all in accordance with the applicable accounting standards. The funded status of the plans is recorded as an asset or liability in the consolidated balance sheets. Funding of retirement benefits varies and is in accordance with local laws and practices.

See Note 18 for additional information relating to retirement programs.

Share-based Compensation– The company has historically granted share-based awards which consist of stock options, restricted stock and performance-based stock. Share-based compensation expense is generally recognized on a straight-line basis over the stated vesting period. For stock awards granted to full-retirement-eligible employees, compensation expense is recognized over the period from the grant date to the date retirement eligibility is achieved. For performance-based awards, compensation expense is recognized only if it is probable that the performance condition will be achieved.

See Note 17 for additional disclosures relating to share-based compensation.

Reclassifications – Certain prior years' amounts have been reclassified to conform to the current year's presentation.

Segment Presentation Change - As a result of the merger and effective with the lifting of the hold separate order in March 2019, new reportable segments were implemented. The new segments are: Americas, EMEA (Europe/Middle East/Africa), APAC (Asia/South Pacific); and Engineering. All periods presented were recast to conform to the new segment structure. See Note 20.

Recently Issued Accounting Standards

Accounting Standards Implemented in 2019

- **Leases –** In February 2016, the FASB issued updated guidance on the accounting and financial statement presentation of leases. The new guidance requires lessees to recognize a right-of-use asset and lease liability for all leases, except those that meet certain scope exceptions, and requires expanded quantitative and qualitative disclosures. This guidance is effective beginning in 2019 and requires companies to transition using a modified retrospective approach. Linde has applied the practical expedient which allows prospective transition to the new lease accounting standard on January 1, 2019. The company elected the package of practical expedients relating to the reassessment of the lease portfolio pertaining to (i) whether expiring or existing contracts contain lease components, (ii) lease classification under ASC 842 and (iii) whether initial direct costs were capitalized under ASC 840. The company further implemented internal controls and key system functionality to enable the preparation of financial information on adoption.

  The standard had an immaterial impact on our consolidated balance sheets and consolidated income statements. The most significant impact was the recognition of right of use ("ROU") assets and lease liabilities for operating leases, while the accounting for finance leases remained substantially unchanged. The company recognized both right of use assets and lease liabilities of $1.2 billion upon adoption. The adoption of the new lease accounting standard had no impact on retained earnings (See Note 6).

- **Derivatives and Hedging** - In August 2017, the FASB issued updated guidance on accounting for hedging activities. The new guidance simplifies hedge effectiveness documentation requirements, changes both the designation and measurement for qualifying hedging relationships and the presentation of hedge results. This guidance was effective for the company beginning in the first quarter of 2019. The adoption of the standard had an immaterial impact on the consolidated financial statements.

Accounting Standards to be Implemented

- **Credit Losses on Financial Instruments** – In June 2016, the FASB issued an update on the measurement of credit losses. The guidance introduces a new accounting model for expected credit losses on financial instruments, including trade receivables, based on estimates of current expected credit losses. This guidance will be effective for the company beginning in the first quarter 2020 and requires companies to apply the change in accounting on a prospective basis. The company is currently evaluating the impact this update will have on the consolidated financial statements and does not expect this guidance to have a material impact.

- **Simplifying the Test for Goodwill Impairment** – In January 2017, the FASB issued updated guidance on the measurement of goodwill. The new guidance eliminates the requirement to calculate the implied fair value of goodwill to measure a goodwill impairment charge. The guidance will be effective for the company beginning in the first quarter 2020 with early adoption permitted. The company does not expect this guidance to have a material impact.

- **Fair Value Measurement Disclosures** - In August 2018, the FASB issued guidance that modifies the disclosure requirements for fair value measurements. The guidance is effective in fiscal year 2020, with early adoption permitted. Certain amendments must be applied prospectively while other amendments must be applied retrospectively. The company is evaluating the impact this guidance will have on the disclosures in the notes to the consolidated financial statements.

- **Retirement Benefit Disclosures** - In August 2018, the FASB issued guidance that modifies the disclosure requirements for employers that sponsor defined benefit pension or other postretirement benefit plans. The guidance is effective in fiscal year 2021, with early adoption permitted, and must be applied on a retrospective basis. The company is evaluating the impact this guidance will have on the disclosures in the notes to the consolidated financial statements.

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NOTE 3. BUSINESS COMBINATION

Merger of Praxair, Inc. and Linde AG

As described in Note 1, on October 31, 2018 Praxair and Linde AG combined their respective businesses through an all-stock transaction and became subsidiaries of the company.

In connection with the business combination, each share of common stock of Praxair par value $0.01 per share, (excluding any shares held in treasury immediately prior to the effective time of the merger, which were automatically canceled and retired for no consideration) was converted into one ordinary share, par value €0.001 per share, of Linde plc. Additionally, each tendered share of common stock of Linde AG was converted into 1.54 ordinary shares of Linde plc.

As provided in the business combination agreement, at the effective time of the business combination outstanding Praxair stock options and other equity awards were generally converted into stock options and equity awards on a 1:1 basis with respect to Linde shares. Outstanding Linde AG share-based compensation awards were either settled in cash (for the portion vested), or were converted into similar stock options and equity awards with respect to Linde shares (for the portion unvested), after giving effect to the 1.54 exchange ratio. See Notes 16 and 17 for additional information.

Allocation of Purchase Price

In accordance with the FASB's ASC 805, *"Business Combinations"*, Praxair was determined to be the accounting acquirer. As such, the company has applied the acquisition method of accounting with respect to the identifiable assets and liabilities of Linde AG, which have been measured at fair value as of the date of the business combination.

In accordance with the business combination agreement, Linde AG shareholders that accepted the exchange offer received Linde shares in exchange for Linde AG shares at an exchange ratio of 1.54 Linde shares for each Linde AG share. Because Praxair is the accounting acquirer, the fair value of the equity issued by Linde plc to Linde AG shareholders in the exchange transaction was determined by reference to the market price of Praxair shares. Accordingly, the purchase consideration below reflects the estimated fair value of the 92% of Linde AG shares tendered and Linde shares issued in exchange for those Linde AG shares, which is based on the final closing price of Praxair shares prior to the effective time of the merger on October 31, 2018 of $164.50 per share.

The purchase price and fair value of Linde AG's net assets acquired as of the merger date on October 31, 2018 is presented as follows:

(in thousands, except value per share data, Linde AG exchange ratio, and purchase price)

Linde AG common stock tendered as of October 31, 2018 (i)	170,875 Shares
Business combination agreement exchange ratio (ii)	1.54 : 1
Linde plc ordinary shares issued in exchange for Linde AG	263,148
Per share price of Praxair, Inc. common stock (iii)	$164.50
Purchase price (millions of dollars)	$43,288

(i) Number of Linde AG shares tendered in the 2017 Exchange Offer.

(ii) Exchange ratio for Linde AG shares as set forth in the business combination agreement.

(iii) Closing price of Praxair shares on the New York Stock Exchange prior to the effective time of the business combination on October 31, 2018.

In accordance with ASC 805, Linde AG's assets and liabilities were measured at fair value at October 31, 2018, primarily using Level 3 inputs except debt which was Level 1. Fair value represents management's best estimate of assumptions about future events and uncertainties, including significant judgments related to future cash flows (sales, costs, customer attrition rates, and contributory asset charges), discount rates, competitive trends, market comparables, and others. Inputs used were generally obtained from historical data supplemented by current and anticipated market conditions and growth rates.

For the year ended December 31, 2019, Linde made measurement period adjustments to reflect facts and circumstances in existence as of the effective date of the Merger. The more significant measurement period adjustments made reflect: the agreed upon sale price of Linde AG’s Korean business resulting in an increase to assets held for sale and corresponding decrease to goodwill of $344 million; an adjustment to the sale value of the Linde AG Americas businesses resulting in a decrease to assets held for sale and corresponding increase to goodwill of $211 million; refinement in the valuation of other intangible assets resulting in an increase to intangible asset values and corresponding decrease to goodwill of $657 million; refinement in the valuation of property, plant and equipment resulting in a decrease to property, plant and equipment and corresponding increase to goodwill of $407 million; an increase to deferred income taxes with a corresponding increase to goodwill of $276 million; and an increase to the fair value of noncontrolling interest with a corresponding increase to goodwill of $222 million. The net impact of these and other less significant adjustments made during the twelve month period resulted in a net increase of $110 million to goodwill. The valuation process to determine the fair values is complete. The following table summarizes the final allocation of purchase price to the identifiable assets acquired and liabilities assumed by Linde, with the excess of the purchase price over the fair value of Linde AG's net assets recorded as goodwill.

Millions of dollars		Fair Value
Assets		
Cash and cash equivalents	$	1,360
Accounts receivable – net		2,857
Inventories		1,439
Assets held for sale		5,375
Prepaid and other current assets		1,251
Property, plant and equipment		18,974
Equity investments		1,521
Goodwill		24,256
Other intangible assets		16,250
Other long-term assets		805
Total Assets Acquired	$	74,088
Less: Liabilities Assumed		
Accounts payable	$	3,360
Short-term debt		1,177
Current portion of long-term debt		1,864
Accrued taxes		159
Liabilities of assets held for sale		676
Other current liabilities		3,058
Long-term debt		6,295
Other long-term liabilities		2,009
Deferred credits, including deferred income taxes		6,834
Total Liabilities Assumed	$	25,432
Less: Redeemable noncontrolling interests		92
Less: Noncontrolling interests		5,276
Purchase Price (i)	$	43,288

(i) See above for the calculation of the purchase price.

Summary of Significant Fair Value Methods

The methods used to determine the fair value of significant identifiable assets and liabilities included in the allocation of purchase price are discussed below.

Inventories

Acquired inventory is comprised of finished goods, work in process and raw materials. The fair value of finished goods was calculated as the estimated selling price, adjusted for costs of the selling effort and a reasonable profit allowance relating to the selling effort. The fair value of work in process inventory was primarily calculated as the estimated selling price, adjusted for estimated costs to complete the manufacturing, estimated costs of the selling effort, as well as a reasonable profit

margin on the remaining manufacturing and selling effort. The fair value of raw materials and supplies was determined based on replacement cost which approximates historical carrying value. The fair value step-up of inventories is being recognized in “Cost of sales” as the inventory is sold.

Assets held for sale and Liabilities of assets held for sale

As described in Note 1, as a condition of the European Commission ("EC"), the U.S. Department of Justice ("DOJ"), and other governmental regulatory authorities approval of the merger, Linde plc, Praxair and Linde AG were required to divest various businesses in Europe, the Americas and Asia. The fair value of these businesses has been determined based on the estimated net selling prices or sales agreements. See Note 4 for further information on merger-related divestitures.

Property, Plant and Equipment

The fair value of property, plant and equipment was primarily calculated using replacement costs adjusted for the age and condition of the asset, and is summarized below:

Property, plant and equipment ("PP&E")		**(in millions)**
Production plants	$	10,358
Storage tanks		1,807
Transportation equipment and other		543
Cylinders		2,487
Buildings		1,953
Land and improvements		677
Construction in progress		1,149
Fair value of PP&E	$	18,974

Identifiable Intangible Assets

The fair value of identifiable intangible assets is summarized below:

	Weighted Average Amortization Period (in years)		(in millions)
Identifiable intangible assets			
Customer relationships	29	$	12,550
Linde brand	Indefinite		1,868
Brands/Tradenames	28		845
Other intangibles	18		987
Fair value of identifiable intangible assets	28	$	16,250

The fair value for all other identifiable intangible assets is based on assumptions that market participants would use in pricing an asset, based on the most advantageous market for the asset (i.e., its highest and best use).

The fair value of the customer relationships intangible asset was valued using a multi-period excess earnings method, a form of the income approach, which incorporates the estimated future cash flows to be generated from Linde AG’s existing customer base. Excess earnings are the earnings remaining after deducting the market rates of return on the estimated values of contributory assets, including debt-free net working capital, tangible assets, and other identifiable intangible assets. The excess earnings are thereby calculated for each year of multi-year projection periods and discounted to present value.

Other intangibles primarily includes acquired technology. Linde brand, brands/tradenames and other intangibles were valued using the relief from royalty method under the income approach; this method estimates the cost savings generated by a company related to the ownership of an asset for which it would otherwise have had to pay royalties or license fees on revenues earned through the use of the asset and discounted to present value.

Linde recognized a pretax net liability representing the unfunded portion of Linde AG's defined-benefit pension and other postretirement benefit ("OPEB") plans. Refer to Note 18 for further information on pensions and OPEB arrangements.

Long-Term Debt

The fair value for long-term debt was primarily obtained from third party quotes, as the majority of the Linde AG bond portfolio is publicly traded.

Deferred Income Tax Assets and Liabilities

The deferred income tax assets and liabilities include the expected future federal, state and foreign tax consequences associated with temporary differences between the preliminary fair values of the assets acquired and liabilities assumed and the respective tax bases. Tax rates utilized in calculating deferred income taxes generally represent the enacted statutory tax rates at the effective date of the merger in the jurisdictions in which legal title of the underlying asset or liability resides.

Refer to Note 7 for further information related to income taxes.

Noncontrolling Interests

Noncontrolling interests include the fair value of noncontrolling interests of Linde AG, including approximately $3.2 billion relating to the 8% of Linde AG shares which were not tendered in the Exchange Offer and were the subject of a cash-merger squeeze-out. The company's wholly-owned indirect subsidiary, Linde Intermediate Holding AG ("Linde Holding"), which directly owns the 92% of Linde AG shares acquired in the Exchange Offer, determined the adequate cash compensation to be paid to the 8% remaining Linde AG minority shareholders in exchange for the transfer of their Linde AG shares for each Linde AG share. The cash-merger squeeze-out was approved by the shareholders of Linde AG at an extraordinary shareholders meeting of Linde AG on December 12, 2018 and completed on April 8, 2019. The remaining noncontrolling interests relate to the fair value of historic noncontrolling interests of Linde AG and its subsidiaries.

Equity Investments

The fair value of equity investments was determined using a discounted cash flow approach.

Other Assets Acquired and Liabilities Assumed (excluding Goodwill)

Linde utilized the carrying values, net of allowances, to value accounts and notes receivable and accounts payable as well as other current assets and liabilities as it was determined that carrying values represented the fair value of those items at the merger date.

Goodwill

The excess of the consideration for the merger over the preliminary fair value of net assets acquired was recorded as goodwill. The merger resulted in the recognition of $24,256 million of goodwill, which is not deductible for tax purposes. The goodwill balance is primarily attributed to the assembled workforce, expanded market opportunities and cost and other operating synergies anticipated upon the integration of the operations of Praxair and Linde AG.

Results of Linde AG Operations in 2018

The results of operations of Linde AG have been included in the company's consolidated statements of income since the merger. The following table provides Linde AG "Sales" and "Income (loss) from continuing operations" included in the company's results for the period November 1 through December 31, 2018.

Millions of dollars **Linde AG Results of Operations**	**November 1, - December 31, 2018**
Sales	$ 2,873
Income (loss) from continuing operations*	$ (385)

* Includes net charges of $451 million related to the impacts of purchase accounting.

Unaudited Pro Forma Information - 2018 and 2017

Linde's unaudited pro forma results presented below were prepared pursuant to the requirements of ASC 805 and give effect to the merger as if it had been consummated on January 1, 2017. The pro forma results have been prepared for comparative purposes only, and do not necessarily represent what the revenue or results of operations would have been had the merger been completed on January 1, 2017. In addition, these results are not intended to be a projection of future operating results and do not reflect synergies that might be achieved.

The unaudited pro forma results include adjustments for the preliminary purchase accounting impact (including, but not limited to, depreciation and amortization associated with the acquired tangible and intangible assets, amortization of the fair value adjustment to investment in nonconsolidated affiliates, and reduction of interest expense related to the fair value adjustment to long-term debt along with the related tax and non-controlling interest impacts), the alignment of accounting policies, adjustments due to IFRS compliant reporting conversion to U.S. GAAP and the elimination of transactions between Praxair and Linde AG.

The unaudited pro forma results for all periods presented below exclude the results of operations of the Linde AG merger-related divestitures (See Note 4) as these divestitures are reflected as discontinued operations. The Praxair merger-related divestitures (See Note 4) are included in the results from continuing operations, including the results from Praxair's European business through the disposition date of December 3, 2018, in the unaudited pro forma results presented below, for all periods presented, as these divestitures do not qualify for discontinued operations.

The unaudited pro forma results are summarized below:

Millions of dollars	2018	2017
Sales (a)	$ 29,774	$ 28,449
Income from continuing operations	$ 4,739	$ 871

(a) Includes sales from Praxair's merger-related divestitures of $1,625 million and $1,553 million for the years ended December 31, 2018 and 2017, respectively.

Significant nonrecurring amounts reflected in the pro forma results are as follows:

A $3,294 million gain ($2,923 million after tax) was recorded in the fourth quarter 2018 as a result of the divestiture of Praxair's European industrial gases business and is included in the December 31, 2018 pro forma income from continuing operations.

From January 1, 2017 through December 31, 2018, Praxair, Inc. and Linde AG collectively incurred pre-tax costs of $736 million ($680 million after tax) to prepare for and close the merger. These merger costs were reflected within the results of operations in the pro forma results as if they were incurred on January 1, 2017. Any costs incurred related to merger-related divestitures and integration and to prepare for the intended business separations were reflected in the pro forma results in the period in which they were incurred.

The company incurred pre-tax charges of $368 million ($279 million after tax) and $10 million ($8 million after tax) in 2018 related to the fair value step-up of inventories acquired and sold as well as a pension settlement due to the payout to certain participants as a result of change in control provisions within a U.S. nonqualified pension plan, respectively. The 2018 pro forma results were adjusted to exclude these charges. The pro forma results for 2017 were adjusted to include these charges, as well as charges incurred subsequent to December 31, 2018 but less than a year from the date of the merger of $13 million ($10 million after tax) related to the remaining fair value step-up of inventories to be sold and $51 million ($40 million after tax) related to an additional pension settlement within the U.S. nonqualified pension plan that occurred in the first quarter of 2019 upon payment. See Note 18 for further information relating to the U.S. nonqualified pension plan settlements.

2019 & 2018 Non-Merger Related Acquisitions

Non-merger related acquisitions of $225 million during the year ended December 31, 2019 and $25 million during the year ended December 31, 2018, largely in the Americas, are not material, individually or in the aggregate.

2017 Acquisitions

During the year ended December 31, 2017, Linde had acquisitions totaling $33 million, primarily acquisitions of packaged gas businesses and a carbon dioxide joint venture in North America.

NOTE 4. MERGER-RELATED DIVESTITURES, DISCONTINUED OPERATIONS AND NET ASSETS HELD FOR SALE

As described in Note 1, as a condition of the European Commission ("EC"), the U.S. Department of Justice ("DOJ"), and other governmental regulatory authorities approval of the merger, Linde plc, Praxair and Linde AG were required to divest the following businesses:

Praxair Merger-Related Divestitures - Primarily European Industrial Gases Business

As a condition of the EC regulatory approval of the merger transaction, Praxair agreed to sell the majority of its industrial gases business in Europe. The sale was completed on December 3, 2018.

- The Società Italiana Acetilene e Derivati S.p.A. ("SIAD") Sale and Purchase Agreement dated December 5, 2017 whereby Praxair agreed, *inter alia*, to sell its 34% non-controlling participation in its Italian joint venture SIAD to its joint venture partner Flow Fin in exchange for Flow Fin's 40% non-controlling participation in Praxair's majority-owned Italian joint venture, Rivoira S.p.A., and cash payment of a net purchase price of €90 million ($102 million as of October 31, 2018) by Praxair to Flow Fin. This transaction was completed on October 31, 2018, and;

- The Praxair Europe Sale and Purchase Agreement dated July 5, 2018 pursuant to which Praxair sold the majority of its European businesses to Taiyo Nippon Sanso Corporation for €5,000 million in cash consideration ($5,700 million at December 3, 2018), reduced by estimated normal closing adjustments of €86 million ($96 million). These transactions were completed on December 3, 2018.

In connection with these transactions, in 2018 the company recognized a net pre-tax gain of $3,294 million ($2,923 million after tax) in the consolidated statements of income and related to the EMEA segment.

The net carrying value of Praxair's European business assets and liabilities divested on December 3, 2018 is presented below:

Millions of dollars	Carrying Value
Assets	
Cash and cash equivalents	$ 38
Accounts receivable – net	311
Inventories	67
Prepaid and other current assets	22
Property, plant and equipment – net	1,342
Equity investments	234
Goodwill	620
Other intangible assets – net	115
Other long-term assets	36
Total Assets Divested	$ 2,785
Liabilities	
Accounts payable	$ 215
Accrued taxes	27
Other current liabilities	111
Long-term debt	2
Other long-term liabilities	92
Deferred credits	174
Total Liabilities Divested	$ 621
Noncontrolling interests	$ 200
Accumulated other comprehensive income (loss)	
Pension/OPEB funded status obligation, net of taxes	(8)
Cumulative translation adjustment, net of taxes	(318)
Net Assets Divested	$ 2,290

Additionally, to satisfy regulatory requirements in other jurisdictions, Praxair agreed to sell certain operations in Chile, China, India and South Korea. The Chilean business was sold as part of the Linde AG Americas SPA (as defined below), the select Indian assets were sold in July 2019, and other sales are expected in 2020. Effective October 22, 2018, the date of final regulatory approvals, these businesses have been accounted for as assets held for sale on the consolidated balance sheets. These businesses were evaluated for discontinued operations accounting treatment under U.S. GAAP and it was determined that they did not meet the definition of a discontinued operation as these transactions did not represent a strategic shift with a major effect, after considering the impact of the merger.

The sale of the select Indian assets was completed on July 12, 2019 with a sale price of $218 million and resulted in a gain of $164 million recognized in "Net gain on sale of businesses" in the consolidated statements of income.

Linde AG Merger-Related Divestitures - Primarily Americas Industrial Gases Business

As a condition of the U.S. regulatory approval of the merger, Linde AG agreed to sell the majority of its industrial gases business in the Americas, as described below:

- The Linde AG Americas Sales and Purchase Agreement, dated July 16, 2018, as and further amended on September 22, 2018, October 19, 2018, and February 20, 2019 whereby Linde AG and Praxair, Inc. entered into an agreement with a consortium comprising companies of the German industrial gases manufacturer Messer Group and CVC Capital Partners Fund VII to sell the majority of Linde AG's industrial gases business in North America and certain industrial gases business activities of Linde AG's in South America for $2.9 billion in cash consideration after purchase price adjustments for certain items relating to assets and liabilities of the sold businesses. In addition, divestitures include $0.5 billion of proceeds for incremental plant sales within the Americas under other agreements. These transactions were completed on March 1, 2019.

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- On April 30, 2019, Linde completed the sale of select assets of Linde Korea to IMM Private Equity Inc., to satisfy requirements of the Korea Fair Trade Commission. The assets divested include bulk and on-site business in Giheung, Pohang and Seosansites as well as oxygen and nitrogen on-site generators. The sale price of $1.2 billion is subject to customary adjustments.

- On December 16, 2019, Linde completed the sale of select assets of Linde India with a sale price of $193 million.

The net carrying value of Linde AG's Americas business assets and liabilities divested on March 1, 2019 is presented below:

Millions of dollars	**Carrying Value**
Assets	
Cash and cash equivalents	$ 200
Accounts receivable – net	479
Inventories	181
Prepaid and other current assets	409
Property, plant and equipment – net	1,590
Equity investments	37
Goodwill	3
Other intangible assets – net	10
Other long-term assets	76
Asset adjustments for estimated fair value	1,650
Total Assets Divested	$ 4,635
Liabilities	
Accounts payable	$ 94
Accrued taxes	60
Other current liabilities	767
Long-term debt	2
Other long-term liabilities	98
Deferred credits	177
Total Liabilities Divested	$ 1,198
Cumulative translation adjustment, net of taxes	12
Net Assets Divested	$ 3,449

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The net carrying value of Linde AG's South Korean business assets and liabilities divested on April 30, 2019 is presented below:

Millions of dollars	Carrying Value
Assets	
Accounts receivable – net	$ 27
Inventories	16
Property, plant and equipment – net	389
Asset adjustments for estimated fair value	879
Total Assets Divested	$ 1,311
Liabilities	
Accounts payable	$ 2
Accrued taxes	12
Other current liabilities	29
Long-term debt	6
Other long-term liabilities	3
Deferred credits	31
Total Liabilities Divested	$ 83
Net Assets Divested	$ 1,228

Discontinued Operations

Only the sales of the Linde AG merger-related divestitures meet the criteria for discontinued operations, Praxair merger-related divestitures do not qualify as discontinued operations. As such, operations related to the Linde AG merger-related divestitures are included within Income from discontinued operations, net of tax for periods subsequent to the merger, as summarized below:

Millions of dollars	2019	November 1, - December 31, 2018
Net sales	$ 449	$ 388
Cost of sales	251	173
Other operating costs	43	90
Operating profit	$ 155	$ 125
Income from equity investments	8	1
Income taxes	54	9
Income from discontinued operations, net of tax	$ 109	$ 117
Noncontrolling interests	(7)	(9)
Income from discontinued operations, net of tax and noncontrolling interests	$ 102	$ 108

For the year ended December 31, 2019 and 2018 there were no material amounts of capital expenditures or significant operating or investing non-cash items related to discontinued operations.

Net Assets Held for Sale

Net assets held for sale includes both the Linde AG merger-related divestitures that meet the criteria for discontinued operations and the Praxair merger-related divestitures that do not. As of December 31, 2019 and 2018, the following assets and liabilities are reported as components of the net assets held for sale in the consolidated balance sheets:

Millions of dollars	December 31, 2019	December 31, 2018
Assets		
Cash and cash equivalents	$ 4	$ 182
Accounts receivable – net	2	297
Inventories	—	209
Prepaid and other current assets	—	54
Property, plant and equipment – net	1	2,005
Other Assets	43	187
Asset adjustments for estimated fair value (Note 3)	75	2,564
Total Assets Classified as Assets Held for Sale	$ 125	$ 5,498
Liabilities		
Accounts payable	2	125
Deferred credits	—	206
Other liabilities	—	437
Total Liabilities Classified as Assets Held for Sale	2	768
Net Assets Classified as Held for Sale	$ 123	$ 4,730

NOTE 5. COST REDUCTION PROGRAMS AND OTHER CHARGES

2019 Charges

Cost reduction programs and other charges were $567 million for the year ended December 31, 2019 ($444 million, after-tax and noncontrolling interests). The following is a summary of the pre-tax charges by reportable segment for the year
ended December 31, 2019.

	Year Ended December 31, 2019				
(millions of dollars)	Severance costs	Other cost reduction charges	**Total cost reduction program related charges**	Transaction related and other charges	**Total**
Americas	$ 36	$ 20	56	34	$ 90
EMEA	105	16	121	21	142
APAC	40	10	50	72	122
Engineering	1	12	13	(9)	4
Other	22	42	64	145	209
Total	$ 204	$ 100	$ 304	$ 263	$ 567

Cost Reduction Programs

Total cost reduction program related charges were $304 million for the year ended December 31, 2019 ($233 million after-tax).

Severance costs

Severance costs of $204 million for the year ended December 31, 2019 are for the elimination of approximately 2,400 positions, largely in EMEA, APAC, and the Americas, of which approximately 1,500 have terminated employment at December 31, 2019. The majority of these actions are anticipated to be completed within the next 12 months.

Other cost reduction charges

Other cost reduction charges of $100 million for the year ended December 31, 2019 are primarily charges related to the execution of the company's synergistic actions including location consolidations and business rationalization projects, software and process harmonization, and associated non-recurring costs.

Transaction Related and Other Charges

On October 31, 2018, Praxair and Linde AG combined under Linde plc, as contemplated by the business combination agreement (see Note 1). Linde incurred merger-related costs and other charges which totaled $263 million ($211 million, after tax and noncontrolling interests) for the year ended December 31, 2019. 2019 includes other charges for an asset impairment related to a joint venture in APAC of approximately $73 million ($42 million, after tax and noncontrolling interests) resulting from an unfavorable arbitration ruling.

Cash Requirements

The total cash requirements of the cost reduction program and other charges during the twelve months ended December 31, 2019 are estimated to be approximately $460 million, of which $260 million was paid through December 31, 2019. Total cost reduction programs and other charges, net of payments in the consolidated statements of cash flows for the twelve months ended December 31, 2019 also reflects the impact of cash payments of liabilities, included merger-related tax liabilities, accrued as of December 31, 2018.

The following table summarizes the activities related to the company's cost reduction related charges for the twelve months ended December 31, 2019:

(millions of dollars)	Severance costs	Other cost reduction charges	**Total cost reduction program related charges**	Transaction related and other charges	**Total**
2019 Cost Reduction Programs and Other Charges	$ 204	$ 100	$ 304	$ 263	$ 567
Less: Cash payments	(91)	(57)	(148)	(112)	(260)
Less: Non-cash charges	—	(21)	(21)	(78)	(99)
Foreign currency translation and other	4	(6)	(2)	(6)	(8)
Balance, December 31, 2019	$ 117	$ 16	$ 133	$ 67	$ 200

2018 Charges

Cost reduction programs and other charges were $309 million for the year ended December 31, 2018 ($306 million, after-tax and non-controlling interest).

Transaction Related and Other Charges

On October 31, 2018, Praxair and Linde AG combined under Linde plc, as contemplated by the business combination agreement (see Note 1). In connection with the business combination, Linde incurred transaction costs which totaled $236 million for the year ended December 31, 2018 ($236 million after-tax).

Also included in Cost Reduction Programs and Other Charges are other charges of $73 million for the year ended December 31, 2018 ($70 million after-tax) comprised of the following; (i) a $40 million charge ($40 million after-tax) related to an unfavorable development related to a supplier contract in China, (ii) restructuring charges of $21 million ($18 million after-tax) and (iii) a $12 million charge ($12 million after-tax) associated with the transition to hyper-inflationary accounting in Argentina.

2017 Charges

Transaction Related and Other Charges

In connection with the intended business combination, Linde incurred transaction costs which totaled $52 million for the year ended December 31, 2017 ($48 million after-tax).

Classification in the consolidated financial statements

The pre-tax charges for each year are shown within operating profit in a separate line item on the consolidated statements of income. In the consolidated balance sheets, reductions in assets are recorded against the carrying value of the related assets and unpaid amounts are recorded primarily as short-term liabilities. On the consolidated statements of cash flows, the pre-tax impact of these charges, net of cash payments, is shown as an adjustment to reconcile net income to net cash provided by operating activities. In Note 20 - Segment Information, Linde excluded these charges from its management definition of segment operating profit; a reconciliation of segment operating profit to consolidated operating profit is shown within the segment operating profit table.

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NOTE 6. LEASES

In the normal course of its business, Linde enters into various leases as the lessee, primarily involving manufacturing and distribution equipment and office space. Linde determines whether a contract is or contains a lease at contract inception. Total lease and rental expenses related to operating lease right of use assets for the twelve months ended December 31, 2019 was $364 million, respectively. Operating leases costs are included in selling, general and administrative expenses and cost of sales, exclusive of depreciation and amortization. The related assets and obligations are included in other long term assets and other current liabilities and other long term liabilities, respectively. Total lease and rental expenses related to finance lease right of use assets for the twelve months ended December 31, 2019 was $31 million, and the costs are included in depreciation and amortization and interest. Related assets and obligations are included in property, plant and equipment - net and debt, respectively**.** Linde includes renewal options that are reasonably certain to be exercised as part of the lease term. Operating and financing lease expenses above include short term and variable lease costs which are immaterial.

As most leases do not provide an implicit rate, Linde uses the applicable incremental borrowing rate at lease commencement to measure lease liabilities and right-of-use assets. Linde determines incremental borrowing rates through market sources.

The company has elected to apply the short-term lease exception for all underlying asset classes. Short-term leases are leases that, at the commencement date, have a lease term of twelve months or less and do not include a purchase option that the lessee is reasonably certain to exercise. Leases that meet the short-term lease definition are not recognized on the balance sheet, but rather expensed on a straight-line basis over the lease term.

Some leasing arrangements require variable payments that are dependent on usage, output, or may vary for other reasons, such as insurance. The company does not have material variable lease payments.

Gains and losses on sale and leaseback transactions were immaterial. Operating cash flows used for operating leases for the twelve months ended December 31, 2019 was $341 million. Cash flows used for finance leases for the same period were immaterial.

Supplemental balance sheet information related to leases is as follows:

(Millions of dollars)	**December 31, 2019**
Operating Leases	
Operating lease right-of-use assets	1,025
Other current liabilities	260
Other long-term liabilities	716
Total operating lease liabilities	976
Finance Leases	
Finance lease right-of-use assets	140
Current portion of long-term debt	32
Long Term debt	117
Total finance lease liabilities	149

Supplemental operating lease information:

	December 31, 2019
Weighted average lease term (years)	7
Weighted average discount rate	2.97 %

Future operating and finance lease payments as of December 31, 2019 are as follows (millions of dollars):

Period	Operating Leases	Financing Leases
2020	$ 275	$ 38
2021	208	31
2022	163	27
2023	110	18
2024	75	10
Thereafter	251	81
Total future undiscounted lease payments	1,082	205
Less imputed interest	(106)	(56)
Total reported lease liability	$ 976	$ 149

Prior to the adoption of the new lease accounting standard, operating and finance lease commitments on an undiscounted basis were approximately $1.3 billion and $104 million, respectively, at December 31, 2018 under long-term non-cancelable leases. The amounts payable for operating leases were as follows:

(Millions of dollars)	**Operating Leases**
2019	$ 305
2020	236
2021	186
2022	145
2023	102
Thereafter	326
Total	$ 1,300

In limited instances Linde acts as a lessor, primarily for assets to provide industrial gas to specific customers. These leases are not significant to the consolidated balance sheets or consolidated statements of income.

NOTE 7. INCOME TAXES

The year ended December 31, 2019 reflects a full year of Linde plc; the year ended December 31, 2018 reflects Praxair for the entire year and Linde AG for the period beginning October 31, 2018 (the merger date), including the impacts of purchase accounting. The amounts for historical periods prior to 2018 solely reflect the results of Praxair. (See Notes 1 and 3.)

Pre-tax income applicable to U.S. and foreign operations is as follows:

(Millions of dollars) **Year Ended December 31,**	**2019**	**2018**	**2017**
United States	$ 1,161	$ 931	$ 1,003
Foreign (a)	1,766	4,118	1,284
Total income before income taxes	$ 2,927	$ 5,049	$ 2,287

(a) 2019 includes a $164 million gain related to the Indian divestiture and 2018 includes a $3,294 million gain related to Europe divestiture (See Note 4).

Provision for Income Taxes

The following is an analysis of the provision for income taxes:

(Millions of dollars) Year Ended December 31,	2019 (a)	2018 (b)	2017 (c)
Current tax expense (benefit)			
U.S. federal	$ 64	$ 390	$ 565
State and local	39	(7)	84
Foreign	969	620	374
	1,072	1,003	1,023
Deferred tax expense (benefit)			
U.S. federal	85	8	(221)
State and local	—	15	19
Foreign	(388)	(209)	205
	(303)	(186)	3
Total income taxes	$ 769	$ 817	$ 1,026

(a) 2019 includes $70 million related to divestitures, foreign current tax expense of $48 million and foreign deferred tax expense of $22 million

(b) 2018 includes a benefit of $61 million related to the Tax Act (See below) and a charge of $371 million ($252 million U.S., $4 million state, $114 million foreign current tax expense and $1 million of U.S. deferred income tax expense) related to divestitures (See Note 4).

(c) 2017 includes a charge of $394 million related to the Tax Act (See below).

U.S. Tax Cuts and Jobs Act (Tax Act) 2018 and 2017

On December 22, 2017 the U.S. government enacted the Tax Cuts and Jobs Act ("Tax Act"). This comprehensive tax legislation significantly revised the U.S. corporate income tax rules by, among other things, lowering the corporate income tax rate from 35% to 21%, implementing a territorial tax system and imposing a one-time tax on accumulated earnings of foreign subsidiaries. The company recorded a net provisional income tax charge of $394 million comprising (i) an estimated $467 million U.S. Federal and state tax charge for deemed repatriation of accumulated foreign earnings; (ii) an estimated $260 million charge for foreign withholding taxes related to anticipated future repatriation of foreign earnings; and (iii) an estimated $333 million deferred tax benefit for the revaluation of net deferred tax liabilities from 35% to the new 21% tax rate. The $467 million U.S. federal and state tax charge for deemed repatriation of accumulated foreign earnings includes $422 million of deemed repatriation tax payable over eight years.

In the fourth quarter of 2018, the company completed its accounting and updated its provisional estimates in accordance with SAB 118 resulting in a net reduction to tax expense of $61 million, $41 million U.S. federal and $20 million of state income tax (net of federal tax benefit). This resulted in a deemed repatriation tax payable of $261 million and $291 million and is payable over the remaining six and seven years, respectively of which $235 million and $265 million is classified as of December 31, 2019 and December 31, 2018 as other long-term liabilities on the consolidated balance sheets (See Note 9).

Further, the Tax Act enacted new provisions related to the taxation of foreign earnings, known as GILTI. The company has elected as an accounting policy to account for GILTI as period costs when incurred.

Additionally, in the fourth quarter of 2018 the company adopted Accounting Standards Update 2018-02, "Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income", electing to reclassify the income tax effects of the Tax Act from Accumulated Other Comprehensive Income ("AOCI") to retained earnings. This resulted in a net reduction to AOCI and a net increase to retained earnings of $93 million, $98 million directly related to the federal income tax rate change reduced by $5 million indirectly related to the federal tax rate change on state income taxes.

Effective Tax Rate Reconciliation

For purposes of the effective tax rate reconciliation, the company utilized the U.S. statutory income tax rate of 21% in 2019 and 2018 and 35% in 2017. An analysis of the difference between the provision for income taxes and the amount computed by applying the U.S. statutory income tax rate to pre-tax income follows:

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(Dollar amounts in millions) Year Ended December 31,	2019		2018		2017	
U.S. statutory income tax	$ 615	21.0 %	$ 1,060	21.0 %	$ 801	35.0 %
State and local taxes – net of federal benefit	31	1.1 %	30	0.6 %	32	1.4 %
U.S. tax credits and deductions (a)	(31)	(1.1)%	(12)	(0.2)%	(27)	(1.2)%
Foreign tax differentials (b)	113	3.9 %	57	1.1 %	(145)	(6.3)%
Share-Based compensation	(41)	(1.4)%	(22)	(0.4)%	(35)	(1.5)%
Tax Act	—	— %	(61)	(1.2)%	394	17.2 %
Divestitures (c)	36	1.2 %	(321)	(6.4)%	—	— %
Other – net (d)	46	1.6 %	86	1.7 %	6	0.3 %
Provision for income taxes	$ 769	26.3 %	$ 817	16.2 %	$ 1,026	44.9 %

(a) U.S. tax credits and deductions relate to foreign derived intangible income in 2019 and 2018, the research and experimentation tax credit in 2019, 2018 and 2017 and manufacturing deduction in 2017.

(b) Primarily related to differences between the U.S. tax rate (21% in 2019 and 2018 and 35% in 2017) and the statutory tax rate in the countries where the company operates. Other permanent items and tax rate changes were not significant.

(c) Divestitures primarily relate to the sale of the company's Indian business in 2019 and European business in 2018 (See Note 4).

(d) Other - net includes $26 million and $34 million of U.S tax related to GILTI in 2019 and 2018, respectively and an increase in unrecognized tax benefits in Europe of $44 million in 2018.

Net Deferred Tax Liabilities

Net deferred tax liabilities included in the consolidated balance sheets are comprised of the following:

(Millions of dollars) December 31,	2019	2018
Deferred tax liabilities		
Fixed assets	$ 3,539	$ 3,935
Goodwill	145	124
Other intangible assets	3,688	3,684
Subsidiary/equity investments	664	570
Other (a)	789	648
	$ 8,825	$ 8,961
Deferred tax assets		
Carryforwards	$ 441	$ 526
Benefit plans and related (b)	721	575
Inventory	72	63
Accruals and other (c)	1,167	1,112
	$ 2,401	$ 2,276
Less: Valuation allowances (d)	(222)	(237)

	$ 2,179	$ 2,039
Net deferred tax liabilities	$ 6,646	$ 6,922
Recorded in the consolidated balance sheets as (Note 9):		
Other long-term assets	243	510
Deferred credits	6,889	7,432
	$ 6,646	$ 6,922

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(a) Includes $255 million in 2019 related to right-of-use lease assets.

(b) Includes deferred taxes of $446 million and $292 million in 2019 and 2018, respectively, related to pension / OPEB funded status (See Notes 9 and 18).

(c) Includes $255 million related to lease liabilities in 2019 and $81 million and $104 million in 2019 and 2018, respectively, related to research and development costs.

(d) Summary of valuation allowances relating to deferred tax assets follows (millions of dollars):

	2019	2018	2017
Balance, January 1,	$ (237)	$ (76)	$ (132)
Income tax (charge) benefit (i)	(31)	(51)	59
Merger with Linde AG	18	(121)	—
Other, including write-offs (ii)	26	7	—
Translation adjustments	2	4	(3)
Balance, December 31,	$ (222)	$ (237)	$ (76)

(i) 2017 includes a $59 million benefit related to the utilization of foreign tax credits under the Tax Act.

(ii) 2019 includes $26 million related to the squeeze out of Linde AG (See Note 3).

The company evaluates deferred tax assets quarterly to ensure that estimated future taxable income will be sufficient in character (e.g., capital gain versus ordinary income treatment), amount and timing to result in their recovery. After considering the positive and negative evidence, a valuation allowance is established to reduce the assets to their realizable value when management determines that it is more likely than not (i.e., greater than 50% likelihood) that a deferred tax asset will not be realized. Considerable judgment is required in establishing deferred tax valuation allowances.

At December 31, 2019, the company had $441 million of deferred tax assets relating to net operating losses (“NOLs”) and tax credits and $222 million of valuation allowances. These deferred tax assets include $312 million relating to NOLs of which $55 million expire within 5 years, $115 million expire after 5 years and $142 million have no expiration. The deferred tax assets also include $129 million related to credits of which $6 million expire within 5 years, $113 million expire after 5 years, and $10 million have no expiration. The valuation allowances of $222 million primarily relate to NOLs and are required because management has determined, based on financial projections and available tax strategies, that it is unlikely that the NOLs will be utilized before they expire. If events or circumstances change, valuation allowances are adjusted at that time resulting in an income tax benefit or charge.

The company has $664 million of foreign income taxes accrued related to its investments in subsidiaries and equity investments as of December 31, 2019. A provision has not been made for any additional foreign income tax at December 31, 2019 on approximately $31 billion related to its investments in subsidiaries because the company intends to remain indefinitely reinvested. While the $31 billion could become subject to additional foreign income tax if there is a sale of a subsidiary, or earnings are remitted as dividends, it is not practicable to estimate the unrecognized deferred tax liability.

Uncertain Tax Positions

Unrecognized income tax benefits represent income tax positions taken on income tax returns but not yet recognized in the consolidated financial statements. The company has unrecognized income tax benefits totaling $472 million, $319 million and $54 million as of December 31, 2019, 2018 and 2017, respectively. If recognized, essentially all of the unrecognized tax benefits and related interest and penalties would be recorded as a benefit to income tax expense on the consolidated statements of income.

A reconciliation of the beginning and ending amount of unrecognized tax benefits is as follows:

(Millions of dollars)	2019	2018	2017
Unrecognized income tax benefits, January 1	$ 319	$ 54	$ 56
Additions for tax positions of prior years (a)	151	104	48
Reductions for tax positions of prior years	(3)	(7)	(26)
Additions for current year tax positions (b)	33	179	—
Reductions for settlements with taxing authorities (c)	(26)	(3)	(26)
Foreign currency translation and other	(2)	(8)	2
Unrecognized income tax benefits, December 31	$ 472	$ 319	$ 54

(a) Increase primarily relates to tax positions in the United States and Europe, $66 million in 2019 related to the merger with Linde AG.

(b) 2018 includes $167 million related to the merger with Linde AG.

(c) Settlements are uncertain tax positions that were effectively settled with the taxing authorities, including positions where the company has agreed to amend its tax returns to eliminate the uncertainty.

The company classifies interest income and expense related to income taxes as tax expense in the consolidated statements of income. The company recognized net interest expense of $1 million, $32 million and $8 million for the years ended December 31, 2019, December 31, 2018 and December 31, 2017, respectively. The company had $65 million and $48 million of accrued interest and penalties as of December 31, 2019 and December 31, 2018, respectively which were recorded in other long-term liabilities in the consolidated balance sheets (See Note 9).

As of December 31, 2019, the company remained subject to examination in the following major tax jurisdictions for the tax years as indicated below:

Major tax jurisdictions	Open Years
North and South America	
United States	2016 through 2019
Canada	2012 through 2019
Mexico	2013 through 2019
Brazil	2005 through 2019
Europe and Africa	
France	2014 through 2019
Germany	2015 through 2019
Netherlands	2015 through 2019
Republic of South Africa	2015 through 2019
Spain	2006 through 2019
United Kingdom	2015 through 2019
Asia and Australia	
Australia	2014 through 2019
China	2014 through 2019
India	2006 through 2019
Korea	2014 through 2019
Taiwan	2015 through 2019

The company is currently under audit in a number of jurisdictions. As a result, it is reasonably possible that some of these matters will conclude or reach the stage where a change in unrecognized income tax benefits may occur within the next twelve months. At the time new information becomes available, the company will record any adjustment to income tax expense as required. Final determinations, if any, are not expected to be material to the consolidated financial statements. The company is also subject to income taxes in many hundreds of state and local taxing jurisdictions that are open to tax examinations.

NOTE 8. EARNINGS PER SHARE – LINDE PLC SHAREHOLDERS

Basic and Diluted earnings per share - Linde plc shareholders is computed by dividing Income From Continuing Operations, Income From discontinued operations, net of tax, and Net income – Linde plc for the period by the weighted average number of either basic or diluted shares outstanding, as follows:

	2019	2018	2017
Numerator (Millions of dollars)			
Income From Continuing Operations	$ 2,183	$ 4,273	$ 1,247
Income from discontinued operations, net of tax	102	108	—
Net Income – Linde plc	$ 2,285	$ 4,381	$ 1,247
Denominator (Thousands of shares)			
Weighted average shares outstanding	540,859	330,088	285,893
Shares earned and issuable under compensation plans	235	313	368
Weighted average shares used in basic earnings per share *	541,094	330,401	286,261
Effect of dilutive securities			
Stock options and awards	4,076	3,726	2,853
Weighted average shares used in diluted earnings per share *	545,170	334,127	289,114
Basic earnings per share from continuing operations	$ 4.03	$ 12.93	$ 4.36
Basic earnings per share from discontinued operations	$ 0.19	$ 0.33	$ —
Basic Earnings Per Share	$ 4.22	$ 13.26	$ 4.36
Diluted earnings per share from continuing operations	$ 4.00	$ 12.79	$ 4.32
Diluted earnings per share from discontinued operations	$ 0.19	$ 0.32	$ —
Diluted Earnings Per Share	$ 4.19	$ 13.11	$ 4.32

* As a result of the merger, share amounts for the year ended December 31, 2018 reflect a weighted average effect of Praxair shares outstanding prior to October 31, 2018 and Linde plc shares outstanding on and after October 31, 2018.

There were no antidilutive shares for the years ended December 31, 2019, 2018 or 2017.

NOTE 9. SUPPLEMENTAL INFORMATION

The year ended December 31, 2018 reflects Praxair for the entire year and the Linde AG for the period beginning after October 31, 2018 (the merger date), including the impacts of purchase accounting. The amounts for historical periods prior to 2018 solely reflect the results of Praxair. See Notes 1 and 3.

Income Statement

(Millions of dollars) **Year Ended December 31,**	2019	2018	2017
Selling, General and Administrative			
Selling	$ 1,600	$ 757	$ 511
General and administrative	1,857	872	696
	$ 3,457	$ 1,629	$ 1,207

Year Ended December 31,	2019	2018	2017
Depreciation and Amortization (a)			
Depreciation	$ 3,940	$ 1,615	$ 1,093
Amortization of intangibles (Note 12)	735	215	91
Depreciation and Amortization	$ 4,675	$ 1,830	$ 1,184

Year Ended December 31,	2019	2018	2017
Other Income (Expenses) – Net			
Currency related net gains (losses)	$ (11)	$ 4	$ (3)
Partnership income	8	8	6
Severance expense	(7)	(7)	(6)
Asset divestiture gains (losses) – net	10	6	4
Other – net	68	7	3
	$ 68	$ 18	$ 4

Year Ended December 31,	2019	2018	2017
Interest Expense – Net			
Interest incurred on debt	$ 284	$ 297	$ 230
Interest income	(112)	(80)	(41)
Amortization on acquired debt	(96)	(21)	—
Interest capitalized	(38)	(20)	(28)
Bond redemption (b)	—	26	—
	$ 38	$ 202	$ 161

Year Ended December 31,	2019	2018	2017
Income Attributable to Noncontrolling Interests			
Noncontrolling interests' operations (c)	$ 87	$ 12	$ 59
Redeemable noncontrolling interests' operations (Note 16)	2	3	2
Noncontrolling interests from continuing operations	$ 89	$ 15	$ 61
Noncontrolling interests from discontinued operations	$ 7	$ 9	$ —

Balance Sheet

(Millions of dollars) December 31,	2019	2018
Accounts Receivable		
Trade and Other receivables	$ 4,628	$ 4,410
Less: allowance for doubtful accounts (d)	(306)	(113)
	$ 4,322	$ 4,297

December 31,	2019	2018
Inventories		
Raw materials and supplies	$ 396	$ 339
Work in process	331	321
Finished goods	970	991
	$ 1,697	$ 1,651

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December 31,	2019	2018
Prepaid and Other Current Assets		
Prepaid and other deferred charges (e)	$ 516	$ 533
VAT recoverable	275	250
Unrealized gains on derivatives (Note 14)	85	66
Other	264	228
	$ 1,140	$ 1,077

December 31,	2019	2018
Other Long-term Assets		
Pension assets (Note 18)	$ 78	$ 140
Insurance contracts (f)	75	75
Long-term receivables, net (g)	150	135
Operating lease assets (Note 6)	1,025	—
Deposits	56	61
Investments carried at cost	40	76
Deferred charges	90	148
Deferred income taxes (Note 7)	243	510
Unrealized gains on derivatives (Note 14)	82	127
Other	174	190
	$ 2,013	$ 1,462

December 31,	2019	2018
Other Current Liabilities		
Accrued expenses	$ 1,079	$ 1,187
Payroll	619	658
VAT payable	268	235
Pension and postretirement (Note 18)	27	117
Interest payable	127	137
Operating lease liability (Note 6)	260	—
Employee benefit accrual	88	104
Insurance reserves	38	36
Unrealized losses on derivatives (Note 14)	54	36
Other	941	1,248
	$ 3,501	$ 3,758

December 31,	2019	2018
Other Long-term Liabilities		
Pension and postretirement (Note 18)	$ 2,548	$ 2,004
Tax liabilities for uncertain tax positions	342	191
Tax Act liabilities for deemed repatriation (Note 7)	235	265
Operating lease liability (Note 6)	716	—
Interest and penalties for uncertain tax positions (Note 7)	65	48
Insurance reserves	28	24
Asset retirement obligation	293	300
Unrealized losses on derivatives (Note 14)	45	43
Other	616	560
	$ 4,888	$ 3,435

December 31,	2019	2018
Deferred Credits		
Deferred income taxes (Note 7)	$ 6,889	$ 7,432
Other	347	179
	$ 7,236	$ 7,611

December 31,	2019	2018
Accumulated Other Comprehensive Income (Loss)		
Cumulative translation adjustment - net of taxes:		
Americas (h)	$ (3,357)	$ (3,375)
EMEA (h)	(136)	105
APAC (h)	(140)	(114)
Engineering	(29)	40
Other	282	(246)
	(3,380)	(3,590)
Derivatives – net of taxes	(27)	(2)
Unrealized gain (loss) on securities	—	(1)
Pension/OPEB funded status obligation (net of $446 million and $292 million tax benefit in 2019 and 2018) (Note 18)	(1,407)	(863)
	$ (4,814)	$ (4,456)

(a) Depreciation and amortization expense in 2019 include $1,298 million and $642 million, respectively, of Linde AG purchase accounting impacts. In 2018, depreciation and amortization expense include $225 million and $121 million, respectively, of Linde AG purchase accounting impacts.

(b) In December 2018, Linde repaid $600 million of 4.50% notes due 2019 and €600 million of 1.50% notes due 2020 resulting in a $26 million interest charge ($20 million after-tax).

(c) Noncontrolling interests from continuing operations includes a $1 million benefit and a $35 million charge in 2019 and 2018, respectively, related to the 8% of Linde AG Shares which were not tendered in the Exchange Offer. Linde AG completed the cash merger squeeze-out of all its minority shares on April 8, 2019 (see Note 3).

In addition, 2019 and 2018 noncontrolling interests from continuing operations include $54 million and $24 million, respectively, of Linde AG purchase accounting impacts.

(d) Provisions to the allowance for doubtful accounts were $170 million, $25 million, and $33 million in 2019, 2018, and 2017, respectively. The allowance activity in each period related primarily to write-offs of uncollectible amounts, net of recoveries and currency movements.

(e) Includes estimated income tax payments of $115 million and $172 million in 2019 and 2018, respectively.

(f) Consists primarily of insurance contracts and other investments to be utilized for non-qualified pension and OPEB obligations.

(g) Long-term receivables are not material and are largely reserved. The balances at December 31, 2019 and 2018 are net of reserves of $44 million and $46 million, respectively. The amounts in both periods relate primarily to long-term notes receivable from customers and government receivables in Brazil. Collectability is reviewed regularly and uncollectible amounts are written-off as appropriate.

(h) Americas consists of currency translation adjustments primarily in Canada, Mexico, and Brazil. EMEA relates primarily to Germany, the United Kingdom and Sweden. APAC relates primarily to China, Korea, India and Australia.

NOTE 10. PROPERTY, PLANT AND EQUIPMENT – NET

Significant classes of property, plant and equipment are as follows:

(Millions of dollars) **December 31,**	**Depreciable Lives (Yrs)**	**2019**	**2018**
Production plants (primarily 15-year life) (a)	10-20	$ 25,493	$ 24,726
Storage tanks	15-20	4,295	4,061
Transportation equipment and other	3-15	2,809	2,654
Cylinders	10-30	4,184	3,955
Buildings	25-40	3,162	3,083
Land and improvements (b)	0-20	1,229	1,162
Construction in progress		3,146	2,296
		44,318	41,937
Less: accumulated depreciation		(15,254)	(12,220)
		$ 29,064	$ 29,717

(a) - Depreciable lives of production plants related to long-term customer supply contracts are consistent with the contract lives.

(b) - Land is not depreciated.

NOTE 11. GOODWILL

Changes in the carrying amount of goodwill for the years ended December 31, 2019 and 2018 were as follows:

(Millions of dollars)	Americas	EMEA	APAC	Engineering	Other	Total
Balance, December 31, 2017	$ 2,306	$ 695	$ 59	$ —	$ 173	$ 3,233
Addition due to Merger (Note 3)	6,890	10,802	5,193	1,060	201	24,146
Acquisitions (Note 3)	5	—	—		—	5
Purchase adjustments & other	12	—	—		—	12
Foreign currency translation	(39)	83	43	15	(4)	98
Disposals (Note 4)	—	(620)	—		—	(620)
Balance, December 31, 2018	9,174	10,960	5,295	1,075	370	26,874
Acquisitions (Note 3)	135	—	—	—	—	135
Measurement period adjustments (Note 3)	(255)	(636)	(323)	1,410	(42)	154
Foreign currency translation	(12)	(81)	(15)	(15)	(21)	(144)
Balance, December 31, 2019	$ 9,042	$ 10,243	$ 4,957	$ 2,470	$ 307	$ 27,019

Linde has historically performed its goodwill impairment tests annually during the second quarter of each year, and has determined that the fair value of each of its reporting units was substantially in excess of its carrying value. For the second quarter 2019 test, Linde applied the FASB's accounting guidance which allows the company to first assess qualitative factors to determine the extent of additional quantitative analysis, if any, that may be required to test goodwill for impairment. Based on the qualitative assessments performed, Linde concluded that it was more likely than not that the fair value of each reporting unit substantially exceeded its carrying value and therefore, further quantitative analysis was not required. As a result, no impairment was recorded.

During the fourth quarter of fiscal year 2019, the company changed the date of its annual goodwill impairment test from April 30 to October 1. The change was made to more closely align the impairment testing date with the company’s planning process. The change in annual impairment testing date did not delay, accelerate or avoid an impairment charge. The company has determined this change in the method of applying an accounting principle is preferable.

Linde's impairment test performed during the fourth quarter of 2019 estimated the fair value of each reporting unit by applying multiples of earnings from a peer group to the company’s forecasted earnings for the year ending December 31, 2019. The peer group is comprised of comparable entities with similar operations and economic characteristics. Linde concluded the fair value of reporting units exceeded its carrying value and therefore recognized no impairment. There were no indicators of impairment through December 31, 2019. Reporting units with greater concentration of Linde AG assets fair valued during the recent merger are at greater risk of impairment in future periods.

NOTE 12. OTHER INTANGIBLE ASSETS

The following is a summary of Linde's other intangible assets at December 31, 2019 and 2018:

(Millions of dollars) For the year ended December 31, 2019	Customer Relationships	Brands/ Tradenames	Other Intangible Assets	Total
Cost:				
Balance, December 31, 2018	$ 13,288	$ 2,288	$ 1,366	$ 16,942
Additions (primarily acquisitions)	30	6	51	87
Foreign currency translation	(59)	(21)	(11)	(91)
Measurement period adjustments (Note 3)	(8)	492	178	662
Other *	(46)	(1)	28	(19)
Balance, December 31, 2019	13,205	2,764	1,612	17,581
Less: accumulated amortization:				
Balance, December 31, 2018	(317)	(22)	(380)	(719)
Amortization expense (Note 9)	(584)	(47)	(104)	(735)
Foreign currency translation	—	—	2	2
Other *	16	—	(8)	8
Balance, December 31, 2019	(885)	(69)	(490)	(1,444)
Net intangible asset balance at December 31, 2019	$ 12,320	$ 2,695	$ 1,122	$ 16,137

(Millions of dollars) For the year ended December 31, 2018	Customer Relationships	Brands/ Tradenames	Other Intangible Assets	Total
Cost:				
Balance, December 31, 2017	$ 772	$ 46	$ 619	$ 1,437
Additions due to merger (Note 3)	12,555	2,226	811	15,592
Additions (primarily acquisitions)	1	—	26	27
Foreign currency translation	121	24	(9)	136
Disposals (Note 4)	(141)	(8)	(78)	(227)
Other *	(20)	—	(3)	(23)
Balance, December 31, 2018	13,288	2,288	1,366	16,942
Less: accumulated amortization:				
Balance, December 31, 2017	(260)	(18)	(374)	(652)
Amortization expense (Note 9)	(135)	(9)	(71)	(215)
Foreign currency translation	4	—	8	12
Disposals (Note 4)	55	5	52	112
Other *	19	—	5	24
Balance, December 31, 2018	(317)	(22)	(380)	(719)
Net balance at December 31, 2018	$ 12,971	$ 2,266	$ 986	$ 16,223

* Other primarily relates to the write-off of fully amortized assets and reclassifications.

There are no expected residual values related to these intangible assets. Amortization expense for the years ended December 31, 2019, 2018 and 2017 was $735 million, $215 million and $91 million, respectively. The remaining weighted-average amortization period for intangible assets is approximately 28 years.

Total estimated annual amortization expense related to finite-lived intangibles is as follows:

(Millions of dollars)		
2020	$	718
2021		713
2022		595
2023		570
2024		556
Thereafter		11,115
Total amortization related to finite-lived intangible assets		14,267
Indefinite-lived intangible assets at December 31, 2019		1,870
Net intangible assets at December 31, 2019	$	16,137

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NOTE 13. DEBT

The following is a summary of Linde's outstanding debt at December 31, 2019 and 2018:

(Millions of dollars)	2019	2018
Short-term		
Commercial paper and U.S. bank borrowings	$ 996	$ 829
Other bank borrowings (primarily international)	736	656
Total short-term debt	1,732	1,485
Long-term (a)		
(U.S. dollar denominated unless otherwise noted)		
1.90% Notes due 2019 (b)	—	500
Variable rate notes due 2019 (b)	—	150
1.75% Euro denominated notes due 2019 (b,c)	—	578
4.25% AUD denominated notes due 2019 (b)	—	71
Variable rate notes due 2019 (b)	—	200
2.25% Notes due 2020	300	299
1.75% Euro denominated notes due 2020 (c)	1,137	1,185
0.634% Euro denominated notes due 2020	56	58
4.05% Notes due 2021	499	499
3.875% Euro denominated notes due 2021 (c)	711	755
3.00% Notes due 2021	499	498
0.250% Euro denominated notes due 2022 (c)	1,129	1,156
2.45% Notes due 2022	599	598
2.20% Notes due 2022	499	498
2.70% Notes due 2023	499	498
2.00% Euro denominated notes due 2023 (c)	776	805
5.875% GBP denominated notes due 2023 (c)	456	454
1.20% Euro denominated notes due 2024	615	628
1.875% Euro denominated notes due 2024 (c)	361	373
2.65% Notes due 2025	398	398
1.625% Euro denominated notes due 2025	556	568
3.20% Notes due 2026	725	725
3.434% Notes due 2026	196	195
1.652% Euro denominated notes due 2027	93	96
1.00% Euro denominated notes due 2028 (c)	872	861
1.90% Euro denominated notes due 2030	118	121
3.55% Notes due 2042	662	662
Other	10	10
International bank borrowings	309	291
Obligations under capital lease	149	81
	12,224	13,811
Less: current portion of long-term debt	(1,531)	(1,523)
Total long-term debt	10,693	12,288
Total debt	$ 13,956	$ 15,296

(a) Amounts are net of unamortized discounts, premiums and/or debt issuance costs as applicable.

(b) In February 2019, Linde repaid $500 million of 1.9% notes that became due; in May 2019 Linde repaid $150 million of variable notes that became due; in June 2019 Linde repaid €500 million of 1.75% notes that became due and the associated interest rate swap was settled; also in June 2019 Linde settled AUD100 million of variable rate notes that became due; and in August 2019 Linde repaid $200 million of variable rate notes that became due.

(c) December 31, 2019 and 2018 included a cumulative $38 million and $14 million adjustment to carrying value, respectively, related to hedge accounting of interest rate swaps.

Credit Facilities

On March 26, 2019 the company and certain of its subsidiaries entered into an unsecured revolving credit agreement ("the Credit Agreement") with a syndicate of banking institutions, which became effective on March 29, 2019. The Credit Agreement provides for total commitments of $5.0 billion, which may be increased up to $6.5 billion, subject to receipt of additional commitments and satisfaction of customary conditions. There are no financial maintenance covenants contained within the Credit Agreement. The revolving credit facility expires on March 26, 2024 with the option to request two one-year extensions of the expiration date. In connection with the effectiveness of the Credit Agreement, Praxair and Linde AG terminated their major respective existing revolving credit facilities. No borrowings were outstanding under the Credit Agreement as of December 31, 2019.

On September 3, 2019 Linde and the company's subsidiaries Praxair and Linde AG entered into a series of parent and subsidiary guarantees related to currently outstanding notes issued by Praxair and Linde AG as well as the $5 billion Credit Agreement.

Other Debt Information

As of December 31, 2019 and 2018, the weighted-average interest rate of short-term borrowings outstanding was 0.6% for both periods.

Expected maturities of long-term debt are as follows:

(Millions of dollars)		
2020	$	1,531
2021		1,855
2022		2,330
2023		1,798
2024		983
Thereafter		3,727
	$	12,224

As of December 31, 2019, the amount of Linde's assets pledged as collateral was immaterial.

See Note 15 for the fair value information related to debt.

NOTE 14. FINANCIAL INSTRUMENTS

In its normal operations, Linde is exposed to market risks relating to fluctuations in interest rates, foreign currency exchange rates, energy costs and to a lesser extent precious metal prices. The objective of financial risk management at Linde is to minimize the negative impact of such fluctuations on the company's earnings and cash flows. To manage these risks, among other strategies, Linde routinely enters into various derivative financial instruments ("derivatives") including interest-rate swap and treasury rate lock agreements, currency-swap agreements, forward contracts, currency options, and commodity-swap agreements. These instruments are not entered into for trading purposes and Linde only uses commonly traded and non-leveraged instruments.

There are three types of derivatives that the company enters into: (i) those relating to fair-value exposures, (ii) those relating to cash-flow exposures, and (iii) those relating to foreign currency net investment exposures. Fair-value exposures relate to recognized assets or liabilities, and firm commitments; cash-flow exposures relate to the variability of future cash flows associated with recognized assets or liabilities, or forecasted transactions; and net investment exposures relate to the impact of foreign currency exchange rate changes on the carrying value of net assets denominated in foreign currencies.

When a derivative is executed and hedge accounting is appropriate, it is designated as either a fair-value hedge, cash-flow hedge, or a net investment hedge. Currently, Linde designates all interest-rate and treasury-rate locks as hedges for accounting purposes; however, cross-currency interest rate contracts are generally not designated as hedges for accounting purposes. Certain currency contracts related to forecasted transactions are designated as hedges for accounting purposes. Whether designated as hedges for accounting purposes or not, all derivatives are linked to an appropriate underlying exposure. On an ongoing basis, the company assesses the hedge effectiveness of all derivatives designated as hedges for accounting purposes to determine if they continue to be highly effective in offsetting changes in fair values or cash flows of the underlying hedged items. If it is determined that the hedge is not highly effective, then hedge accounting will be discontinued prospectively.

Counterparties to Linde's derivatives are major banking institutions with credit ratings of investment grade or better. The company has Credit Support Annexes ("CSAs") in place with their principal counterparties to minimize potential default risk and to mitigate counterparty risk. Under the CSAs, the fair values of derivatives for the purpose of interest rate and currency management are collateralized with cash on a regular basis. As of December 31, 2019, the impact of such collateral posting arrangements on the fair value of derivatives was insignificant. Management believes the risk of incurring losses on derivative contracts related to credit risk is remote and any losses would be immaterial.

The following table is a summary of the notional amount and fair value of derivatives outstanding at December 31, 2019 and 2018 for consolidated subsidiaries:

			Fair Value			
(Millions of dollars)	Notional Amounts		Assets (a)		Liabilities (a)	
December 31,	2019	2018	2019	2018	2019	2018
Derivatives Not Designated as Hedging Instruments:						
Currency contracts:						
Balance sheet items	$ 7,936	$ 6,357	$ 62	$ 24	$ 37	$ 42
Forecasted transactions	748	945	14	15	15	17
Cross-currency interest rate swaps	1,029	2,110	35	112	40	40
Commodity contracts	N/A	N/A	—	27	—	9
Total	9,713	9,412	111	178	92	108
Derivatives Designated as Hedging Instruments:						
Currency contracts:						
Balance sheet items	$ 27	$ —	$ 2	$ —	$ 3	$ —
Forecasted transactions	464	158	9	2	3	3
Commodity contracts	N/A	N/A	6	—	1	—
Interest rate swaps	1,908	2,164	39	13	—	10
Total Hedges	$ 2,399	$ 2,322	$ 56	$ 15	$ 7	$ 13
Total Derivatives	$ 12,112	$ 11,734	$ 167	$ 193	$ 99	$ 121

(a) Current assets of $85 million are recorded in prepaid and other current assets; long-term assets of $82 million are recorded in other long-term assets; current liabilities of $54 million are recorded in other current liabilities; and long-term liabilities of $45 million are recorded in other long-term liabilities.

Balance Sheet Items

Foreign currency contracts related to balance sheet items consist of forward contracts entered into to manage the exposure to fluctuations in foreign-currency exchange rates on recorded balance sheet assets and liabilities denominated in currencies other than the functional currency of the related operating unit. Certain forward currency contracts are entered into to protect underlying monetary assets and liabilities denominated in foreign currencies from foreign exchange risk and are not designated as hedging instruments. For balance sheet items that are not designated as hedging instruments, the fair value adjustments on these contracts are offset by the fair value adjustments recorded on the underlying monetary assets and liabilities.

Forecasted Transactions

Foreign currency contracts related to forecasted transactions consist of forward contracts entered into to manage the exposure to fluctuations in foreign-currency exchange rates on (1) forecasted purchases of capital-related equipment and services, (2) forecasted sales, or (3) other forecasted cash flows denominated in currencies other than the functional currency of the related operating units. For forecasted transactions that are designated as cash flow hedges, fair value adjustments are recorded to accumulated other comprehensive income ("AOCI") with deferred amounts reclassified to earnings over the same time period as the income statement impact of the associated purchase. For forecasted transactions that do not qualify for cash flow hedging relationships, fair value adjustments are recorded directly to earnings.

Interest Rate/Cross-Currency Interest Rate Swaps

Cross-currency interest rate swaps are entered into to limit the foreign currency risk of future principal and interest cash flows associated with intercompany loans, and to a more limited extent bonds, denominated in non-functional currencies. The fair value adjustments on the cross-currency swaps are recorded to earnings, where they are offset by fair value adjustments on the underlying intercompany loan or bond.

Commodity Contracts

Commodity contracts are entered into to manage the exposure to fluctuations in commodity prices, which arise in the normal course of business from its procurement transactions. To reduce the extent of this risk, Linde enters into a limited number of electricity, natural gas, and propane gas derivatives. The fair value adjustments for the majority of these contracts are recorded to AOCI and are eventually offset by the income statement impact of the underlying commodity purchase.

Net investment hedges

As of December 31, 2019, Linde has not designated any hedges of net investment positions in foreign operations. Linde had previously designated Euro-denominated debt instruments as net investment hedges to reduce the company's exposure to changes in the currency exchange rate on investments in foreign subsidiaries with Euro functional currencies. Exchange rate movements of $206 million relating to the previously denominated Euro-denominated debt incurred in the financial periods prior to de-designation will remain in AOCI, until appropriate, such as upon sale or liquidation of the foreign operations at which time amounts will be reclassified to the consolidated statements of income. Exchange rate movements related to the Euro-denominated debt occurring after de-designation are shown in the consolidated statements of income.

Interest Rate Swaps

Linde uses interest rate swaps to hedge the exposure to changes in the fair value of financial assets and financial liabilities as a result of interest rate changes. These interest rate swaps effectively convert fixed-rate interest exposures to variable rates; fair value adjustments are recognized in earnings along with an equally offsetting charge/benefit to earnings for the changes in the fair value of the underlying financial asset or financial liability. The notional value of outstanding interest rate swaps of Linde with maturity dates from 2020 through 2028 was $1,908 million at December 31, 2019 and $2,164 at December 31, 2018 (see Note 13 for further information).

Terminated Treasury Rate Locks

The unrecognized aggregate losses related to terminated treasury rate lock contracts on the underlying $500 million 3.00% fixed-rate notes that mature in 2021 and the $500 million 2.20% fixed-rate notes that mature in 2022 at December 31, 2019 and December 31, 2018 were $2 million (net of taxes of $1 million) and $2 million (net of taxes of $1 million), respectively. The unrecognized gains/(losses) for the treasury rate locks are shown in AOCI and are being recognized on a straight line basis to interest expense - net over the term of the underlying debt agreements.

Impact of derivative instruments on earnings and AOCI

The following table summarizes the impact of the company's derivatives on the consolidated statements of income:

(Millions of dollars)	**Amount of Pre-Tax Gain (Loss) Recognized in Earnings ***		
December 31,	**2019**	**2018**	**2017**
Derivatives Not Designated as Hedging Instruments			
Currency contracts:			
Balance sheet items:			
Debt-related	$ 253	$ (118)	$ 121
Other balance sheet items	65	3	—
Total	$ 318	$ (115)	$ 121

* The gains (losses) on balance sheet items are offset by gains (losses) recorded on the underlying hedged assets and liabilities. Accordingly, the gains (losses) for the derivatives and the underlying hedged assets and liabilities related to debt items are recorded in the consolidated statements of income as interest expense-net. Other balance sheet items and anticipated net income gains (losses) are recorded in the consolidated statements of income as other income (expenses)-net.

The amounts of gain or loss recognized in AOCI and reclassified to the consolidated statement of income was immaterial for the year ended December 31, 2019. Net losses expected to be reclassified to earnings during the next twelve months are also not material.

The gains (losses) on net investment hedges are recorded as a component of AOCI within foreign currency translation adjustments in the consolidated balance sheets and the consolidated statements of comprehensive income. The gains (losses) on treasury rate locks are recorded as a component of AOCI within derivative instruments in the consolidated balance sheets and the consolidated statements of comprehensive income. The gains (losses) on net investment hedges are reclassified to earnings only when the related currency translation adjustments are required to be reclassified, usually upon sale or liquidation of the investment. The gains (losses) for interest rate contracts are reclassified to earnings as interest expense –net on a straight-line basis over the remaining maturity of the underlying debt.

NOTE 15. FAIR VALUE DISCLOSURES

The fair value hierarchy prioritizes the inputs to valuation techniques used to measure fair value into three broad levels as follows:

Level 1 – quoted prices in active markets for identical assets or liabilities
Level 2 – quoted prices for similar assets and liabilities in active markets or inputs that are observable
Level 3 – inputs that are unobservable (for example cash flow modeling inputs based on assumptions)

Assets and Liabilities Measured at Fair Value on a Recurring Basis

The following table summarizes assets and liabilities measured at fair value on a recurring basis at December 31, 2019 and 2018:

	Fair Value Measurements Using					
(Millions of dollars)	Level 1		Level 2		Level 3	
	2019	2018	2019	2018	2019	2018
Assets						
Derivative assets	$ —	$ —	$ 167	$ 193	$ —	$ —
Investments and securities *	18	22	—	—	28	30
Total	$ 18	$ 22	$ 167	$ 193	$ 28	$ 30
Liabilities						
Derivative liabilities	$ —	$ —	$ 99	$ 121	$ —	$ —

* Investments and securities are recorded in prepaid and other current assets and other long-term assets in the company's consolidated balance sheets.

Level 1 investments and securities are marketable securities traded on an exchange. Level 2 investments are based on market prices obtained from independent brokers or determined using quantitative models that use as their basis readily observable market parameters that are actively quoted and can be validated through external sources, including third-party pricing services, brokers and market transactions. Level 3 investments and securities consist of a venture fund. For the valuation, Linde uses the net asset value received as part of the fund's quarterly reporting, which for the most part is not based on quoted prices in active markets. In order to reflect current market conditions, Linde proportionally adjusts these by observable market data (stock exchange prices) or current transaction prices.

The following table summarizes the changes in level 3 investments and securities for the year ended December 31, 2019. Gains (losses) recognized in earnings are recorded to interest expense - net in the company's consolidated statements of income.

(Millions of dollars)	2019
Balance at January 1	$ 30
Additions	1
Gains (losses) recognized in earnings	(3)
Balance at December 31	$ 28

The fair value of cash and cash equivalents, short-term debt, accounts receivable-net, and accounts payable approximate carrying value because of the short-term maturities of these instruments.

The fair value of long-term debt is estimated based on the quoted market prices for the same or similar issues. Long-term debt is categorized within either Level 1 or Level 2 of the fair value hierarchy depending on the trading volume of the issues and whether or not they are actively quoted in the market as opposed to traded through over-the-counter transactions. At December 31, 2019, the estimated fair value of Linde’s long-term debt portfolio was $12,375 million versus a carrying value of $12,224 million. At December 31, 2018 the estimated fair value of Linde’s long-term debt portfolio was $13,725 million versus a carrying value of $13,811 million. As Linde AG's assets and liabilities were measured at estimated fair value as of the merger date, differences between the carrying value and the fair value not significant; remaining differences are attributable to interest rate increases subsequent to when the debt was issued and relative to stated coupon rates.

NOTE 16. EQUITY AND NONCONTROLLING INTERESTS

Linde plc Shareholders' Equity

At December 31, 2019 and 2018, Linde has total authorized share capital of €1,825,000 divided into 1,750,000,000 ordinary shares of €0.001 each, 25,000 A ordinary shares of €1.00 each, 25,000 deferred shares of €1.00 each and 25,000,000 preferred shares of €0.001 each.

At December 31, 2019 there were 552,012,862 and 534,380,544 of Linde plc ordinary shares issued and outstanding, respectively. At December 31, 2019 there were no shares of A ordinary shares, deferred shares or preferred shares issued or outstanding.

At December 31, 2018 there were 551,310,272 and 547,241,630 of Linde plc ordinary shares issued and outstanding, respectively. At December 31, 2018, there were no shares of A ordinary shares, deferred shares or preferred shares issued or outstanding.

Linde's Board of Directors may from time to time authorize the issuance of one or more series of preferred stock and, in connection with the creation of such series, determine the characteristics of each such series including, without limitation, the preference and relative, participating, optional or other special rights, and the qualifications, limitations or restrictions of the series.

2018 Merger of Praxair and Linde AG

Following is a summary of the Linde plc shareholders' equity transactions related to the merger:

	Ordinary Shares		Additional Paid in Capital	Treasury Stock	
(Dollar amounts in millions, shares in thousands)	Shares	Amount		Shares	Amount
Merger with Linde AG (a)	263,148	$ —	$ 43,288	—	$ —
Conversion of Praxair to Linde plc shares (b)	—	(3)	3	—	—
Cancellation of Praxair Treasury stock (c)	(95,324)	—	(7,113)	(95,324)	7,113
Impact of Linde AG merger	167,824	$ (3)	$ 36,178	(95,324)	$ 7,113

(a) The total fair value of consideration transferred for the merger was $43,288 million, resulting in an increase to "Additional paid-in capital" in stockholders' equity (see Note 3 for additional information).

(b) On October 31, 2018, the conversion of Praxair common stock and Linde AG common stock into Linde ordinary shares resulted in a $3 million decrease to "Ordinary Shares" with a corresponding increase to "Additional paid-in capital" in stockholders' equity.

(c) Each share of Praxair common stock held in treasury immediately prior to the merger was canceled. The elimination of Praxair's historical treasury stock at cost resulted in a $7,113 million decrease in "Treasury stock" and "Additional paid-in capital" in stockholders' equity.

As indicated above, in connection with the merger, Praxair and Linde AG common stock was converted into shares of Linde plc ordinary shares. The following table provides a summary of the share activity resulting from the merger:

(in thousands, except Linde AG exchange ratio)

Linde plc shares exchanged for Linde AG shares	
Linde AG common stock tendered as of October 31, 2018 (i)	170,875
Business combination agreement exchange ratio (ii)	1.54

Linde plc ordinary shares issued in exchange for Linde AG	263,148
Linde plc shares issued to Praxair shareholders upon conversion	
Praxair shares outstanding at merger date	287,907
Total Linde plc shares issued at merger date	**551,055**

(i)	Number of Linde AG shares tendered in the 2017 Exchange Offer.
(ii)	Exchange ratio for Linde AG shares as set forth in the business combination agreement.

Other Linde plc Ordinary Share and Treasury Stock Transactions

Linde may issue new ordinary shares for dividend reinvestment and stock purchase plans and employee savings and incentive plans. The number of new Linde ordinary shares issued from the merger date through December 31, 2019 was 958,293 shares.

On December 10, 2018 the Linde board of directors approved the repurchase of $1.0 billion of its ordinary shares under which Linde had repurchased 6,385,887 shares through December 31, 2019 (4,068,642 shares were repurchased through December 31, 2018). Linde completed the repurchases under this program in the first quarter of 2019.

Subsequently, on January 22, 2019 the company’s board of directors approved the additional repurchase of $6.0 billion of its ordinary shares under which Linde had repurchased 12,016,083 shares through December 31, 2019.

Noncontrolling Interests

Noncontrolling interest ownership changes are presented within the consolidated statements of equity. The $2,921 million decrease during 2019 was primarily driven by Linde AG completion of the cash merger squeeze-out of all its minority shares on April 8, 2019. This represents the 8% of Linde AG shares which were not tendered in the Exchange Offer and were the subject of a cash-merger squeeze-out (See Note 3).

The $186 million decrease during 2018 primarily relates to the sale of Praxair's industrial gases business in Europe (see Notes 1 and 4). The "Impact of Merger" line item of the consolidated statements of equity includes the fair value of the noncontrolling interests acquired from Linde AG, including the 8% of Linde AG shares which were not tendered in the Exchange Offer and were intended to be the subject of a cash-merger squeeze-out (See Note 3).

The $15 million increase during 2017 relates to additional funding provided to PG Technologies, LLC ("PGT") by the joint venture partner.

Redeemable Noncontrolling Interests

Noncontrolling interests with redemption features, such as put/sell options, that are not solely within the company’s control (“redeemable noncontrolling interests”) are reported separately in the consolidated balance sheets at the greater of carrying value or redemption value. For redeemable noncontrolling interests that are not yet exercisable, Linde calculates the redemption value by accreting the carrying value to the redemption value over the period until exercisable. If the redemption value is greater than the carrying value, any increase is adjusted directly to retained earnings and does not impact net income. At December 31, 2019, the redeemable noncontrolling interest balance includes industrial gas businesses in EMEA and Americas where the noncontrolling shareholders have put options.

NOTE 17. SHARE-BASED COMPENSATION

Share-based compensation expense was $95 million in 2019 ($62 million and $59 million in 2018 and 2017, respectively). The related income tax benefit recognized was $42 million in 2019 ($30 million and $53 million in 2018 and 2017, respectively). The expense was primarily recorded in selling, general and administrative expenses and no share-based compensation expense was capitalized.

Summary of Plans

The 2009 Praxair, Inc. Long-Term Incentive Plan was initially adopted by the board of directors and shareholders of Praxair, Inc. on April 28, 2009 and has been amended since its initial adoption ("the 2009 Plan"). Upon completion of the business combination of Praxair, Inc. with Linde AG on October 31, 2018, the 2009 Plan was assumed by the company. Prior to April 28, 2009, Praxair, Inc. granted equity awards under the 2002 Praxair, Inc. Long-Term Incentive Plan , ("the 2002 Plan") which was also assumed by the company upon completion of the business combination. The 2009 Plan permits awards of stock options, stock appreciation rights, restricted stock and restricted stock units, performance-based stock units and other equity awards to eligible officer and non-officer employees and non-employee directors of the company and its affiliates. As of December 31, 2019, 6,454,428 shares remained available for equity grants under the 2009 Plan, of which 1,757,354 shares may be granted as awards other than options or stock appreciation rights.

In 2005, the board of directors and shareholders of Praxair, Inc. adopted the 2005 Equity Compensation Plan for Non-Employee Directors of Praxair, Inc. ("the 2005 Plan"). Upon completion of the business combination in October 2018, the 2005 Plan was also assumed by the company. Under the 2005 Plan, the aggregate number of shares available for option and other equity grants was limited to a total of 500,000 shares. The 2005 Plan expired on April 30, 2010, by its own terms, and no shares were available for grant thereafter.

Upon the completion of the business combination, all options outstanding under the 2009 Plan, the 2002 Plan and the 2005 Plan were converted into options to acquire the same number of shares of the company and at the same exercise price per share that applied prior to the business combination.

Exercise prices for options granted under the 2009 Plan may not be less than the closing market price of the company's ordinary shares on the date of grant and granted options may not be re-priced or exchanged without shareholder approval. Options granted under the 2009 Plan subject only to time vesting requirements may become partially exercisable after a minimum of one year after the date of grant but may not become fully exercisable until at least three years have elapsed from the date of grant, and all options have a maximum duration of ten years. Options granted under predecessor plans had similar terms.

In connection with the business combination, on October 31, 2018 the company's Board of Directors adopted the Long Term Incentive Plan 2018 of Linde plc ("the LTIP 2018"), the purpose of which is to replace certain outstanding Linde AG equity based awards that were terminated. Under the LTIP 2018, the aggregate number of shares available for replacement option rights and replacement restricted share units was set at 473,128. As of December 31, 2019, 260,794 shares remained available for grant, and since the company was obligated to make these replacement awards in 2019, it does not anticipate any further grants under this plan.

Exercise prices for the replacement option rights that were granted in 2019 under the LTIP 2018 were equal to EUR 1.67 ($1.92 as converted at an exchange rate from the time the exchange offer was completed as the option rights are exercisable in U.S. dollars on the NYSE) as prescribed in the business combination agreement. Each replacement option right granted under the LTIP 2018 is subject to vesting based on continued service until the end of the four-year waiting period applicable to the relevant Linde AG award that had been granted before the business combination. After vesting, each option right will be exercisable for one year.

In order to satisfy option exercises and other equity grants, the company may issue authorized but previously unissued shares or it may issue treasury shares.

Stock Option Fair Value

The company utilizes the Black-Scholes Options-Pricing Model to determine the fair value of stock options consistent with that used in prior years. Management is required to make certain assumptions with respect to selected model inputs, including anticipated changes in the underlying stock price (i.e., expected volatility) and option exercise activity (i.e., expected life). Expected volatility is based on the historical volatility of the company's stock over the most recent period commensurate with the estimated expected life of the company's stock options and other factors. The expected life of options granted, which represents the period of time that the options are expected to be outstanding, is based primarily on historical exercise experience. The expected dividend yield is based on the company's most recent history and expectation of dividend payouts. The risk-free rate is based on the U.S. Treasury yield curve in effect at the time of grant for a period commensurate with the estimated expected life. If factors change and result in different assumptions in future periods, the stock option expense that the company records for future grants may differ significantly from what the company has recorded in the current period.

The weighted-average fair value of options granted during 2019 was $23.38 ($19.29 in 2018 and $12.40 in 2017) based on the Black-Scholes Options-Pricing model. The increase in grant date fair value year-over-year is primarily attributable to the increase in the company's stock price. The weighted-average fair value of replacement option rights granted in 2019 was $160.08 based on intrinsic value method.

The following weighted-average assumptions were used to value the grants in 2019, 2018 and 2017:

Year Ended December 31,	2019	2018	2017
Dividend yield	2.0 %	2.1 %	2.7 %
Volatility	14.3 %	14.4 %	14.0 %
Risk-free interest rate	2.38 %	2.67 %	2.13 %
Expected term years	6	5	6

The following table summarizes option activity under the plans as of December 31, 2019 and changes during the period then ended (averages are calculated on a weighted basis; life in years; intrinsic value expressed in millions):

Activity	Number of Options (000's)	Average Exercise Price	Average Remaining Life	Aggregate Intrinsic Value
Outstanding at January 1, 2019	10,624	$ 117.65		
Granted	1,486	157.14		
Exercised	(2,705)	103.87		
Cancelled or expired	(108)	158.17		
Outstanding at December 31, 2019	9,297	$ 127.04	6.0	$ 798
Exercisable at December 31, 2019	6,306	$ 117.26	5.0	$ 603

The aggregate intrinsic value represents the difference between the company's closing stock price of $212.90 as of December 31, 2019 and the exercise price multiplied by the number of in the money options outstanding as of that date. The total intrinsic value of stock options exercised during 2019 was $219 million ($113 million and $137 million in 2018 and 2017, respectively).

Cash received from option exercises under all share-based payment arrangements for 2019 was $64 million ($66 million and $107 million in 2018 and 2017, respectively). The cash tax benefit realized from share-based compensation totaled $56 million for 2019 ($30 million and $51 million cash tax benefit in 2018 and 2017, respectively).

As of December 31, 2019, $32 million of unrecognized compensation cost related to non-vested stock options is expected to be recognized over a weighted-average period of approximately 1 year.

Performance-Based and Restricted Stock Awards

In 2019, Linde granted 261,760 performance-based stock awards under the 2009 Plan to senior management that vest, subject to the attainment of pre-established minimum performance criteria, principally on the third anniversary of their date of grant. These awards are tied to either after tax return on capital ("ROC") performance or relative total shareholder return ("TSR") performance versus that of the S&P 500 (weighted 67%) and Eurofirst 300 (weighted 33%). The actual number of shares issued in settlement of a vested award can range from zero to 200 percent of the target number of shares granted based upon the company's attainment of specified performance targets at the end of a three-year period. Compensation expense related to these awards is recognized over the three-year performance period based on the fair value of the closing market price of the company's ordinary shares on the date of the grant and the estimated performance that will be achieved. Compensation expense for ROC awards will be adjusted during the three-year performance period based upon the estimated performance levels that will be achieved. TSR awards are measured at their grant date fair value and not subsequently re-measured.

The weighted-average fair value of ROC performance-based stock awards granted in 2019 was $168.47, and during 2017 was $109.68. These fair values are based on the closing market price of Linde's ordinary shares on the grant date adjusted for dividends that will not be paid during the vesting period. There were no ROC performance-based stock awards granted in 2018.

The weighted-average fair value of performance-based stock tied to relative TSR performance granted in 2019 was $215.85, and during 2017 was $124.12, and was estimated using a Monte Carlo simulation performed as of the grant date. There were no performance-based stock tied to relative TSR performance granted in 2018.

Upon completion of the merger, each outstanding ROC and TSR performance-based award granted prior to 2018 was converted into a Linde RSU based on performance achieved as of immediately prior to the closing of the merger, and became subject to service-vesting conditions only. This resulted in the conversion of 435,000 performance-based shares into 704,000 restricted stock units. Compensation expense related to these awards will continue to be recognized over the remainder of the respective three-year service period.

There were 161,072 restricted stock units granted to employees by Linde during 2019. The weighted-average fair value of restricted stock units granted during 2019 was $165.04 ($144.86 in 2018 and $111.95 in 2017). These fair values are based on the closing market price of Linde's ordinary shares on the grant date adjusted for dividends that will not be paid during the vesting period. Compensation expense related to the restricted stock units is recognized over the vesting period.

The following table summarizes non-vested performance-based and restricted stock award activity as of December 31, 2019 and changes during the period then ended (shares based on target amounts, averages are calculated on a weighted basis):

	Performance-Based		Restricted Stock	
	Number of Shares (000's)	Average Grant Date Fair Value	Number of Shares (000's)	Average Grant Date Fair Value
Non-vested at January 1, 2019	—	$ —	1,071	$ 118.84
Granted	262	184.29	161	165.04
Vested	—	—	(330)	107.10
Cancelled and Forfeited	(16)	184.26	(18)	146.32
Non-vested at December 31, 2019	246	$ 184.29	884	$ 129.43

There are approximately 7 thousand performance-based shares and 11 thousand restricted stock shares that are non-vested at December 31, 2019 which will be settled in cash due to foreign regulatory limitations. The liability related to these grants reflects the current estimate of performance that will be achieved and the current share price.

As of December 31, 2019, $23 million of unrecognized compensation cost related to performance-based awards and $21 million of unrecognized compensation cost related to the restricted stock awards is expected to be recognized primarily through the first quarter of 2022.

NOTE 18. RETIREMENT PROGRAMS

Defined Benefit Pension Plans - U.S.

Linde has two main U.S. retirement programs which are non-contributory defined benefit plans: the Linde U.S. Pension Plan and the CBI Pension Plan. The latter program benefits primarily former employees of CBI Industries, Inc. which Linde acquired in 1996. Effective July 1, 2002, the Linde U.S. Pension Plan was amended to give participating employees a one-time choice to remain covered by the old formula or to elect coverage under a new formula. The old formula is based predominantly on years of service, age and compensation levels prior to retirement, while the new formula provides for an annual contribution to an individual account which grows with interest each year at a predetermined rate. Also, this new formula applies to all new employees hired after April 30, 2002 into businesses adopting this plan. The U.S. and international pension plan assets are comprised of a diversified mix of investments, including domestic and international corporate equities, government securities and corporate debt securities. Linde has several plans that provide supplementary retirement benefits primarily to higher level employees that are unfunded and are nonqualified for federal tax purposes. Pension coverage for employees of certain of Linde's international subsidiaries generally is provided by those companies through separate plans. Obligations under such plans are primarily provided for through diversified investment portfolios, with some smaller plans provided for under insurance policies or by book reserves.

Defined Benefit Pension Plans - International

Linde has international, defined benefit commitments primarily in Germany and the United Kingdom (U.K.). The defined benefit commitments in Germany relate to old age pensions, invalidity pensions and surviving dependents pensions. These commitments also take into account vested rights for periods of service prior to January

1, 2002 based on earlier final-salary pension plan rules. In addition, there are direct commitments in respect of the salary conversion scheme for the form of cash balance plans. The resulting pension payments are calculated on the basis of an interest guarantee and the performance of the corresponding investment. There are no minimum funding requirements. The pension obligations in Germany are partly funded by a Contractual Trust Agreement (CTA). Defined benefit commitments in the U.K. prior to July 1, 2003 are earnings-related and dependent on the period of service. Such commitments relate to old age pensions, invalidity pensions and surviving dependents pensions. Beginning in April 1, 2011, the amount of future increases in inflation-linked pensions and of increases in pensionable emoluments was restricted.

Multi-employer Pension Plans

In the United States Linde participates in eight multi-employer defined benefit pension plans ("MEPs"), pursuant to the terms of collective bargaining agreements, that cover approximately 200 union-represented employees. The collective bargaining agreements expire on different dates through 2026. In connection with such agreements, the company is required to make periodic contributions to the MEPs in accordance with the terms of the respective collective bargaining agreements. Linde’s participation in these plans is not material either at the plan level or in the aggregate. Linde’s contributions to these plans were $2 million in 2019, 2018, and 2017 (these costs are not included in the tables that follow). For all MEPs, Linde’s contributions were significantly less than 1% of the total contributions to each plan for 2018 and 2017. Total 2019 contributions were not yet available from the MEPs.

Linde has obtained the most recently available Pension Protection Act ("PPA") annual funding notices from the Trustees of the MEPs. The PPA classifies MEPs as either Red, Yellow or Green Zone plans. Among other factors, plans in the Red Zone are generally less than 65 percent funded with a projected insolvency date within the next twenty years; plans in the Yellow Zone are generally 65 to 80 percent funded; and plans in the Green Zone are generally at least 80 percent funded. Red Zone plans are considered to be in "critical" or "critical and declining" status, while Yellow Zone plans are considered to be in "endangered" status. Plans that are in neither "critical" nor "endangered" status are considered to have Green Zone status. According to the most recent data available, four of the MEPs that the company participates in are in a Red Zone status and four are in a Green Zone status. As of December 31, 2019, the four Red Zone plans have pending or have implemented financial improvement or rehabilitation plans. Linde does not currently anticipate significant future obligations due to the funding status of these plans. If Linde determined it was probable that it would withdraw from an MEP, the company would record a liability for its portion of the MEP’s unfunded pension obligations, as calculated at that time. Historically, such withdrawal payments have not been significant.

Defined Contribution Plans

Linde’s U.S. business employees are eligible to participate in the Linde defined contribution savings plan. Employees may contribute up to 40% of their compensation, subject to the maximum allowable by IRS regulations. For the U.S. packaged gases business, company contributions to this plan are calculated as a percentage of salary based on age plus service. U.S. employees other than those in the packaged gases business have company contributions to this plan calculated on a graduated scale based on employee contributions to the plan. The cost for these defined contribution plans was $47 million in 2019, $33 million in 2018 and $29 million in 2017 (these costs are not included in the tables that follow).

The defined contribution plans include a non-leveraged employee stock ownership plan ("ESOP") which covers all employees participating in this plan. The collective number of shares of Linde ordinary shares in the ESOP totaled 2,070,100 at December 31, 2019.

Certain international subsidiaries of the company also sponsor defined contribution plans where contributions are determined under various formulas. The expense for these plans was $95 million in 2019, $32 million in 2018 and $21 million in 2017 (these expenses are not included in the tables that follow).

Postretirement Benefits Other Than Pensions (OPEB)

Linde provides health care and life insurance benefits to certain eligible retired employees. These benefits are provided through various insurance companies and healthcare providers. The company does not currently fund its postretirement benefits obligations. Linde’s retiree plans may be changed or terminated by Linde at any time for any reason with no liability to current or future retirees.

Linde uses a measurement date of December 31 for its pension and other post-retirement benefit plans.

Pension and Postretirement Benefit Costs

The components of net pension and postretirement benefits other than pension ("OPEB") costs for 2019, 2018 and 2017 are shown in the table below (2018 reflects the impact of the Linde AG merger on October 31, 2018 (see

Notes 1 and 3) and the divestiture of Praxair's European industrial gases business on December 3, 2018 (see Notes 1 and 4)):

(Millions of dollars) Year Ended December 31,	Pensions			OPEB		
	2019	2018	2017	2019	2018	2017
Amount recognized in Operating Profit						
Service cost	$ 142	$ 74	$ 46	$ 2	$ 2	$ 3
Amount recognized in Net pension and OPEB cost (benefit), excluding service cost						
Interest cost	261	128	103	7	5	5
Expected return on plan assets	(462)	(219)	(161)	—	—	—
Net amortization and deferral	61	71	68	(4)	(3)	(3)
Curtailment and termination benefits (a)	8	—	—	—	—	(18)
Settlement charges (b)	97	14	2	—	—	—
	$ (35)	$ (6)	$ 12	$ 3	$ 2	$ (16)
Amount recognized in Net gain on sale of businesses						
Settlement gains from divestitures (c)	—	(44)	—	—	—	—
Net periodic benefit cost (benefit)	$ 107	$ 24	$ 58	$ 5	$ 4	$ (13)

(a) In 2019, Linde recorded curtailment gains of $9 million and a charge of $17 million for termination benefits, primarily in connection with a defined benefit pension plan freeze. The curtailment gain recorded during the year ended December 31, 2017 resulted from the termination of an OPEB plan in South America in the first quarter.

(b) In the third and fourth quarters of 2019, Linde recorded pension settlement charges of $40 million and $6 million, respectively, related to lump sum payments made from a U.S. qualified plan. These payments were triggered by merger-related divestitures. In the first quarter of 2019, benefits of $91 million were paid related to the settlement of a U.S. non-qualified plan. Such benefits were triggered by a change in control provision and resulted in a settlement charge of $51 million.

2018 includes the impact of a $4 million charge and a $10 million charge recorded in the third and fourth quarters, respectively. In the third quarter, a series of lump sum benefit payments made from the U.S. supplemental pension plan triggered a settlement of the related pension obligation. In the fourth quarter, a change in control provision triggered the settlement of a U.S. non-qualified plan.

2017 includes the impact of a $2 million charge related to a series of lump sum benefit payments for employees under an international pension plan.

(c) In connection with Praxair merger-related divestitures, primarily the European industrial gases business, certain European pension plan obligations were settled. This resulted in the recognition of associated pension benefit obligations and deferred losses in accumulated other comprehensive income (loss) within operating profit in the "Net gain on sale of businesses" line item.

Funded Status

Changes in the benefit obligation and plan assets for Linde’s pension and OPEB programs, including reconciliation of the funded status of the plans to amounts recorded in the consolidated balance sheet, as of December 31, 2019 and 2018 are shown below.

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(Millions of dollars) Year Ended December 31,	Pensions 2019 U.S.	Pensions 2019 International	Pensions 2018 U.S.	Pensions 2018 International	OPEB 2019	OPEB 2018
Change in Benefit Obligation ("PBO")						
Benefit obligation, January 1	$ 2,508	$ 7,533	$ 2,215	$ 725	$ 184	$ 146
Merger impact (a)	—	—	415	6,920	—	53
Service cost	38	104	42	32	2	2
Interest cost	81	180	74	54	7	5
Divestitures (b)	(1)	—	—	(106)	—	—
Participant contributions	—	20	—	4	8	9
Plan amendment	—	13	—	1	—	—
Actuarial loss (gain)	266	1,045	(100)	7	8	(11)
Benefits paid	(105)	(333)	(111)	(84)	(20)	(19)
Plan settlement	(235)	—	(27)	—	—	—
Plan curtailment	—	(9)	—	—	2	—
Foreign currency translation and other changes	—	136	—	(20)	1	(1)
Benefit obligation, December 31	$ 2,552	$ 8,689	$ 2,508	$ 7,533	$ 192	$ 184
Accumulated benefit obligation ("ABO")	$ 2,464	$ 8,553	$ 2,428	$ 7,385		
Change in Plan Assets						
Fair value of plan assets, January 1	$ 1,952	$ 6,292	$ 1,655	$ 567	$ —	$ —
Merger impact (a)	—	—	475	5,880	—	—
Actual return on plan assets	341	598	(72)	(88)	—	—
Company contributions	—	94	—	75	—	—
Benefits paid from plan assets	(244)	(268)	(106)	(69)	—	—
Divestitures (b)	(1)	—	—	(49)	—	—
Foreign currency translation and other changes	—	172	—	(24)	—	—
Fair value of plan assets, December 31	$ 2,048	$ 6,888	$ 1,952	$ 6,292	$ —	$ —
Funded Status, End of Year	$ (504)	$ (1,801)	$ (556)	$ (1,241)	$ (192)	$ (184)
Recorded in the Balance Sheet (Note 9)						
Other long-term assets	$ —	$ 78	$ 47	$ 93	$ —	$ —
Other current liabilities	(6)	(10)	(94)	(10)	(11)	(13)
Other long-term liabilities	(498)	(1,869)	(509)	(1,324)	(181)	(171)
Net amount recognized, December 31	$ (504)	$ (1,801)	$ (556)	$ (1,241)	$ (192)	$ (184)
Amounts recognized in accumulated other comprehensive income (loss) consist of:						
Net actuarial loss (gain)	$ 753	$ 1,110	$ 834	$ 339	$ (10)	$ (23)
Prior service cost (credit)	—	4	—	10	(4)	(5)
Deferred tax benefit (Note 7)	(190)	(251)	(212)	(87)	(5)	7
Amount recognized in accumulated other comprehensive income (loss) (Note 9)	$ 563	$ 863	$ 622	$ 262	$ (19)	$ (21)

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(a) Represents Linde AG plan assets and benefit obligations assumed as part of the merger. Such plan assets and benefit obligations were remeasured as of the merger date and all subsequent activity through December 31, 2018 is presented within the respective captions above.

(b) Represents plan assets and benefit obligations associated with the divestiture of the majority of the Praxair industrial gases business in Europe.

Comparative funded status information as of December 31, 2019 and 2018 for select international pension plans is presented in the table below as the benefit obligations of these plans are considered to be significant relative to the total benefit obligation:

(Millions of dollars)	United Kingdom 2019	Germany 2019	Other International 2019	Total International 2019
Benefit obligation, December 31	$ 5,221	$ 2,180	$ 1,288	$ 8,689
Fair value of plan assets, December 31	4,777	1,119	992	6,888
Funded Status, End of Year	$ (444)	$ (1,061)	$ (296)	$ (1,801)

(Millions of dollars)	United Kingdom 2018	Germany 2018	Other International 2018	Total International 2018
Benefit obligation, December 31	$ 4,444	$ 1,916	$ 1,173	$ 7,533
Fair value of plan assets, December 31	4,339	1,043	910	6,292
Funded Status, End of Year	$ (105)	$ (873)	$ (263)	$ (1,241)

The changes in plan assets and benefit obligations recognized in other comprehensive income in 2019 and 2018 are as follows:

	Pensions		OPEB	
(Millions of dollars)	2019	2018	2019	2018
Current year net actuarial losses (gains)*	$ 834	$ 286	$ 8	$ (11)
Amortization of net actuarial gains (losses)	(59)	(70)	3	2
Divestitures	—	(12)	—	—
Plan amendment	(4)	—	—	—
Amortization of prior service credits (costs)	(2)	(1)	1	1
Pension settlements	(97)	(14)	—	—
Curtailments	—	—	2	—
Foreign currency translation and other changes	12	(16)	—	1
Total recognized in other comprehensive income	$ 684	$ 173	$ 14	$ (7)

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* Pension net actuarial losses in 2019 are largely driven by lower discount rates across all significant pension plans. In the U.S., the benefit from the actual return on assets more than offset the impacts of unfavorable liability experience, resulting from the low discount rate environment. For the international plans, the unfavorable impact of lower discount rates outweighed favorable plan asset experience. Pension net actuarial losses in 2018 are driven by lower U.S. discount rates, which more than offset favorable plan asset experience. OPEB net actuarial losses in 2019 relate to the low interest rate environment, which was partially offset by favorable actual benefit payment experience. Net actuarial gains in 2018 relate to the benefits from higher U.S. discount rates and favorable actual participant experience.

The amounts in accumulated other comprehensive income (loss) that are expected to be recognized as components of net periodic benefit cost during 2020 are as follows:

(Millions of dollars)	Pension	OPEB
Net actuarial loss (gain)	$ 88	$ (2)

Prior service cost (credit)	2	(1)
	$ 90	$ (3)

The following table provides information for pension plans where the accumulated benefit obligation exceeds the fair value of the plan assets:

(Millions of dollars) **Year Ended December 31,**	**Pensions 2019 U.S.**	**Pensions 2019 International**	**Pensions 2018 U.S.**	**Pensions 2018 International**
Projected benefit obligation ("PBO")	$ 2,552	$ 7,768	$ 2,139	$ 6,681
Accumulated benefit obligation ("ABO")	$ 2,464	$ 7,664	$ 2,060	$ 6,586
Fair value of plan assets	$ 2,048	$ 5,849	$ 1,482	$ 5,307

Assumptions

The assumptions used to determine benefit obligations are as of the respective balance sheet dates and the assumptions
used to determine net benefit cost are as of the previous year-end, as shown below:

	Pensions U.S. 2019	**Pensions U.S. 2018**	**Pensions International 2019**	**Pensions International 2018**	**OPEB 2019**	**OPEB 2018**
Weighted average assumptions used to determine benefit obligations at December 31,						
Discount rate	3.20 %	4.20 %	1.91 %	2.72 %	3.19 %	4.16 %
Rate of increase in compensation levels	3.25 %	3.25 %	2.46 %	2.38 %	N/A	N/A
Weighted average assumptions used to determine net periodic benefit cost for years ended December 31,						
Discount rate	4.20 %	3.73 %	2.72 %	2.73 %	4.16 %	3.81 %
Rate of increase in compensation levels	3.25 %	3.25 %	2.38 %	2.45 %	N/A	N/A
Expected long-term rate of return on plan assets (1)	7.27 %	7.62 %	5.15 %	5.13 %	N/A	N/A

(1) The expected long term rate of return on the U.S. and international plan assets is estimated based on the plans' investment strategy and asset allocation, historical capital market performance and, to a lesser extent, historical plan performance. For the U.S. plans, the expected rate of return of 7.27% was derived based on the target asset allocation of 40%-60% equity securities (approximately 8.5% expected return), 30%-50% fixed income securities (approximately 5.3% expected return) and 5%-15% alternative investments (approximately 6.8% expected return). For the international plans, the expected rate of return was derived based on the weighted average target asset allocation of 15%-25% equity securities (approximately 6.1% expected return), 30%-50% fixed income securities (approximately 4.8% expected return), and 30%-50% alternative investments (approximately 5.2% expected return). For the U.S. plan assets, the actual annualized total return for the most recent 10-year period ended December 31, 2019 was approximately 9.2%. For the international plan assets, the actual annualized total return for the same period was approximately 7.0%. Changes to plan asset allocations and investment strategy over this time period limit the value of historical plan performance as factor in estimating the expected long term rate of return. For 2020, the expected long-term rate of return on plan assets will be 7.00% for the U.S. plans. Expected weighted average returns for international plans will vary.

Assumed healthcare cost trend rates	OPEB 2019	OPEB 2018
Historical Praxair, Inc. plans		
Healthcare cost trend assumed	7.00 %	6.25 %
Rate to which the cost trend rate is assumed to decline (the ultimate trend rate)	5.00 %	5.00 %
Year that the rate reaches the ultimate trend rate	2027	2023
Historical Linde AG plans		
Healthcare cost trend assumed	5.49 %	5.49 %
Rate to which the cost trend rate is assumed to decline (the ultimate trend rate)	4.50 %	4.50 %
Year that the rate reaches the ultimate trend rate	2038	2038

These healthcare cost trend rate assumptions have an impact on the amounts reported. However, cost caps limit the impact on the net OPEB benefit cost in the U.S. To illustrate the effect, a one-percentage point change in assumed healthcare
cost trend rates would have the following effects:

(Millions of dollars)	One-Percentage Point Increase	One-Percentage Point Decrease
Effect on the total of service and interest cost components of net OPEB benefit cost	$ —	$ —
Effect on OPEB benefit obligation	$ 7	$ (6)

Pension Plan Assets

The investments of the U.S. pension plan are managed to meet the future expected benefit liabilities of the plan over the long term by investing in diversified portfolios consistent with prudent diversification and historical and expected capital market returns. Investment strategies are reviewed by management and investment performance is tracked against appropriate benchmarks. There are no concentrations of risk as it relates to the assets within the plans. The international pension plans are managed individually based on diversified investment portfolios, with different target asset allocations that vary for each plan. Linde’s U.S. and international pension plans’ weighted-average asset allocations at December 31, 2019 and 2018, and the target asset allocation range for 2019, by major asset category, are as follows:

	U.S.				International			
Asset Category	**Target 2019**	**Target 2018**	**2019**	**2018**	**Target 2019**	**Target 2018**	**2019**	**2018**
Equity securities	40%-60%	40%-60%	55 %	48 %	15%-25%	15%-25%	23 %	20 %
Fixed income securities	30%-50%	30%-50%	30 %	40 %	30%-50%	30%-50%	41 %	46 %
Other	5%-15%	5%-15%	15 %	13 %	30%-50%	30%-40%	36 %	34 %

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The following table summarizes pension assets measured at fair value by asset category at December 31, 2019 and 2018. During the years presented, there has been no transfer of assets between Levels 1, 2 and 3 (see Note 15 for definition of the levels):

	Fair Value Measurements Using							
	Level 1		Level 2		Level 3 **		Total	
(Millions of dollars)	2019	2018	2019	2018	2019	2018	2019	2018
Cash and cash equivalents	$ 436	$ 348	$ —	$ —	$ —	$ —	$ 436	$ 348
Equity securities:								
Global equities	1,395	1,131	—	—	—	—	1,395	1,131
Mutual funds	110	74	52	43	—	—	162	117
Fixed income securities:								
Government bonds	—	—	1,642	1,772	—	—	1,642	1,772
Emerging market debt	—	—	459	522	—	—	459	522
Mutual funds	225	109	14	21	—	—	239	130
Corporate bonds	—	—	401	382	—	—	401	382
Bank loans	—	—	210	313	—	—	210	313
Alternative investments:								
Real estate funds	—	—	—	—	316	298	316	298
Private debt	—	—	—	—	1,003	671	1,003	671
Other investments	—	—	33	33	—	—	33	33
Liquid alternative	—	—	1,087	1,192	—	—	1,087	1,192
Total plan assets at fair value, December 31,	$ 2,166	$ 1,662	$ 3,898	$ 4,278	$ 1,319	$ 969	$ 7,383	$ 6,909
Pooled funds *							1,553	1,335
Total fair value plan assets December 31,							$ 8,936	$ 8,244

* Pooled funds are measured using the net asset value ("NAV") as a practical expedient for fair value as permissible under the accounting standard for fair value measurements and have not been categorized in the fair value hierarchy.

** The following table summarizes changes in fair value of the pension plan assets classified as level 3 for the periods ended December 31, 2019 and 2018:

(Millions of dollars)	Insurance Contracts	Real Estate Funds	Private Debt	Total
Balance, December 31, 2017	$ 50	$ 158	$ —	$ 208
Assumed in Linde AG merger	—	148	667	815
Gain/(Loss) for the period	—	9	4	13
Merger-related divestitures	(49)	—	—	(49)
Sales	—	(17)	—	(17)
Foreign currency translation	(1)	—	—	(1)
Balance, December 31, 2018	$ —	$ 298	$ 671	$ 969
Gain/(Loss) for the period	—	24	30	54
Acquisitions	—	—	14	14
Purchases	—	26	304	330
Sales	—	(22)	(33)	(55)
Transfer into / (out of) Level 3	—	(10)	—	(10)
Foreign currency translation	—	—	17	17
Balance, December 31, 2019	$ —	$ 316	$ 1,003	$ 1,319

The descriptions and fair value methodologies for the company's pension plan assets are as follows:

Cash and Cash Equivalents – This category includes cash and short-term interest bearing investments with maturities of three months or less. Investments are valued at cost plus accrued interest. Cash and cash equivalents are classified within level 1 of the valuation hierarchy.

Equity Securities – This category is comprised of shares of common stock in U.S. and international companies from a diverse set of industries and size. Common stock is valued at the closing market price reported on a U.S. or international exchange where the security is actively traded. Equity securities are classified within level 1 of the valuation hierarchy.

Mutual Funds – These categories consist of publicly and privately managed funds that invest primarily in marketable equity and fixed income securities. The fair value of these investments is determined by reference to the net asset value of the underlying securities of the fund. Shares of publicly traded mutual funds are valued at the net asset value quoted on the exchange where the fund is traded and are primarily classified as level 1 within the valuation hierarchy.

U.S. and International Government Bonds – This category includes U.S. treasuries, U.S. federal agency obligations and international government debt. The majority of these investments do not have quoted market prices available for a specific government security and so the fair value is determined using quoted prices of similar securities in active markets and is classified as level 2 within the valuation hierarchy.

Corporate Bonds – This category is comprised of corporate bonds of U.S. and international companies from a diverse set of industries and size. The fair values for U.S. and international corporate bonds are determined using quoted prices of similar securities in active markets and observable data or broker or dealer quotations. The fair values for these investments are classified as level 2 within the valuation hierarchy.

Pooled Funds - Pooled fund NAVs are provided by the trustee and are determined by reference to the fair value of the underlying securities of the trust, less its liabilities, which are valued primarily through the use of directly or indirectly observable inputs. Depending on the pooled fund, underlying securities may include marketable equity securities or fixed income securities.

Bank Loans - This category is comprised of traded syndicated loans of larger corporate borrowers. Such loans are issued by sub-investment grade rated companies both in the U.S. and internationally and are syndicated by investment banks to institutional investors. They are regularly traded in an active dealer market comprised of large investment banks, which supply bid and offer quotes and are therefore classified within level 2 of the valuation hierarchy.

Liquid Alternative Investments - This category is comprised of investments in alternative mutual funds whose holdings include liquid securities, cash, and derivatives. Such funds focus on diversification and employ a variety of investing strategies including long/short equity, multi-strategy, and global macro. The fair value of these investments is determined by reference to the net asset value of the underlying holdings of the fund, which can be determined using observable data (e.g., indices, yield curves, quoted prices of similar securities), and is classified within level 2 of the valuation hierarchy.

Insurance Contracts – The fair value of insurance contracts is determined based on the cash surrender value of the insurance contract, which is determined based on such factors as the fair value of the underlying assets and discounted cash flows. These contracts are with highly rated insurance companies. Insurance contracts are classified within level 3 of the valuation hierarchy.

Real Estate Funds – This category includes real estate properties, partnership equities and investments in operating companies. The fair value of the assets is determined using discounted cash flows by estimating an income stream for the property plus a reversion into a present value at a risk adjusted rate. Yield rates and growth assumptions utilized are derived from market transactions as well as other financial and industry data. The fair value for these investments are classified within level 3 of the valuation hierarchy.

Private Debt - This category includes non-traded, privately-arranged loans between one or a small group of private debt investment managers and corporate borrowers, which are typically too small to access the syndicated market and have no credit rating. This category also includes similar loans to real estate companies or individual properties. Loans included in this category are valued at par value, are held to maturity or to call, and are classified within level 3 of the valuation hierarchy.

Contributions

At a minimum, Linde contributes to its pension plans to comply with local regulatory requirements (e.g., ERISA in the United States). Discretionary contributions in excess of the local minimum requirements are made based on many factors, including long-term projections of the plans' funded status, the economic environment, potential risk of overfunding, pension insurance costs and alternative uses of the cash. Changes to these factors can impact the timing of discretionary contributions from year to year. Pension contributions were $94 million in 2019, $87 million in 2018 and $19 million in 2017. Estimated required contributions for 2020 are currently expected to be in the range of $50 million to $80 million.

Estimated Future Benefit Payments

The following table presents estimated future benefit payments, net of participant contributions:

(Millions of dollars)	Pensions		
Year Ended December 31,	**U.S.**	**International**	**OPEB**
2020	$ 187	$ 311	$ 15
2021	143	323	14
2022	164	335	14
2023	147	342	14
2024	149	352	12
2025-2029	760	879	55

NOTE 19. COMMITMENTS AND CONTINGENCIES

The company accrues non income-tax liabilities for contingencies when management believes that a loss is probable and the amounts can be reasonably estimated, while contingent gains are recognized only when realized. In the event any losses are sustained in excess of accruals, they will be charged against income at that time. Attorney fees are recorded as incurred. Commitments represent obligations, such as those for future purchases of goods or services, that are not yet recorded on the company's balance sheet as liabilities. The company records liabilities for commitments when incurred (i.e., when the goods or services are received).

Contingent Liabilities

Linde is subject to various lawsuits and government investigations that arise from time to time in the ordinary course of business. These actions are based upon alleged environmental, tax, antitrust and personal injury claims, among others. Linde has strong defenses in these cases and intends to defend itself vigorously. It is possible that the company may incur losses in connection with some of these actions in excess of accrued liabilities. Management does not anticipate that in the aggregate such losses would have a material adverse effect on the company's consolidated financial position or liquidity; however, it is possible that the final outcomes could have a significant impact on the company's reported results of operations in any given period.

Significant matters are:

- During May 2009, the Brazilian government published Law 11941/2009 instituting a new voluntary amnesty program ("Refis Program") which allowed Brazilian companies to settle certain federal tax disputes at reduced amounts. During the 2009 third quarter, the company decided that it was economically beneficial to settle many of its outstanding federal tax disputes and such disputes were enrolled in the Refis Program, subject to final calculation and review by the Brazilian federal government. The company recorded estimated liabilities based on the terms of the Refis Program. Since 2009, Linde has been unable to reach final agreement on the calculations and initiated litigation against the government in an attempt to resolve certain items. Open issues relate to the following matters: (i) application of cash deposits and net operating loss carryforwards to satisfy obligations and (ii) the amount of tax reductions available under the Refis Program. It is difficult to estimate the timing of resolution of legal matters in Brazil.

- At December 31, 2019 the most significant non-income and income tax claims in Brazil, after enrollment in the Refis Program, relate to state VAT tax matters and a federal income tax matter where the taxing authorities are challenging the tax rate that should be applied to income generated by a subsidiary company. The total estimated exposure relating to such claims, including interest and penalties, as appropriate, is approximately $260 million. Linde has not recorded any liabilities related to such claims based on management judgments, after considering judgments and opinions of outside counsel. Because litigation in Brazil historically takes many years to resolve, it is very difficult to estimate the timing of resolution of these matters; however, it is possible that certain of these matters may be resolved within the near term. The company is vigorously defending against the proceedings.

- On September 1, 2010, CADE (Brazilian Administrative Council for Economic Defense) announced alleged anticompetitive activity on the part of five industrial gas companies in Brazil and imposed fines. Originally, CADE imposed a civil fine of R$2.2 billion Brazilian reais ($546 million) on White Martins, the Brazil-based subsidiary of Praxair, Inc. The fine was reduced to R$1.7 billion Brazilian reais ($422 million) due to a calculation error made by CADE. On September 14, 2015, the fine against White Martins was overturned by the Ninth Federal Court of Brasilia. CADE appealed this decision on June 30, 2016.

  Similarly, on September 1, 2010, CADE imposed a civil fine of R$237 million Brazilian reais ($59 million) on Linde Gases Ltda., the former Brazil-based subsidiary of Linde AG, which was divested to MG Industries GmbH on March 1, 2019 and with respect to which Linde provided a contractual indemnity. The fine was reduced to R$188 million Brazilian reais ($47 million) due to a calculation error made by CADE. On May 6, 2014 the fine against Linde Gases Ltda. was overturned by the Seventh Federal Court in Brasilia. CADE appealed this decision on October 27, 2016.

  Linde has strong defenses and is confident that it will prevail on appeal and have the fines overturned. Linde strongly believes that the allegations of anticompetitive activity against our current and former Brazilian subsidiaries are not supported by valid and sufficient evidence. Linde believes that this decision will not stand up to judicial review and deems the possibility of cash outflows to be extremely unlikely. As a result, no reserves have been recorded as management does not believe that a loss from this case is probable.

- On and after April 23, 2019 former shareholders of Linde AG filed appraisal proceedings at the District Court (Landgericht) Munich I (Germany), seeking an increase of the cash consideration paid in connection with the previously completed cash merger squeeze-out of all of Linde AG's minority shareholders for €189.46 per share. Any such increase would apply to all 14,763,113 Linde AG shares that were outstanding on April 8, 2019, when the cash merger squeeze-out was completed. The period for plaintiffs to file claims expired on July 9, 2019. The company believes the consideration paid was fair and that the claims lack merit, and no reserve has been established. We cannot estimate the timing of resolution.

Commitments

At December 31, 2019, Linde had undrawn outstanding letters of credit, bank guarantees and surety bonds valued at approximately $3,276 million from financial institutions. These relate primarily to customer contract performance guarantees (including plant construction in connection with certain on-site contracts), self-insurance claims and other commercial and governmental requirements, including foreign litigation matters.

Other commitments related to leases, tax liabilities for uncertain tax positions, long-term debt, other post retirement and pension obligations are summarized elsewhere in the financial statements (see Notes 6, 7, 13, and 18).

NOTE 20. SEGMENT INFORMATION

Effective October 31, 2018, Praxair and Linde AG completed the previously announced merger, resulting in the formation of Linde plc (see Note 1 for additional information on the merger). As a result of the merger and effective with the lifting of the hold separate order effective on March 1, 2019, new operating segments were created which are used by the company's Chief Operating Decision Maker ("CODM") to allocate company resources and assess performance. Linde's operations consist of two major product lines: industrial gases and engineering. As further described in the following paragraph, Linde's industrial gases operations are managed on a geographic basis, which represent three of the company's new reportable segments - Americas, EMEA (Europe/Middle East/Africa), and APAC (Asia/South Pacific); a fourth reportable segment which represents the company's Engineering business, designs and manufactures equipment for air separation and other industrial gas applications specifically for end customers and is managed on a worldwide basis operating in all three geographic segments. Other consists of corporate costs and a few smaller businesses which individually do not meet the quantitative thresholds for separate presentation.

The industrial gases product line centers on the manufacturing and distribution of atmospheric gases (oxygen, nitrogen, argon, rare gases) and process gases (carbon dioxide, helium, hydrogen, electronic gases, specialty gases, acetylene). Many of these products are co-products of the same manufacturing process. Linde manufactures and distributes nearly all of its products and manages its customer relationships on a regional basis. Linde's industrial gases are distributed to various end-markets within a regional segment through one of three basic distribution methods: on-site or tonnage; merchant or bulk; and packaged or cylinder gases. The distribution methods are generally integrated in order to best meet the customer's needs and very few of its products can be economically transported outside of a region. Therefore, the distribution economics are specific to the various geographies in which the company operates and are consistent with how management assesses performance.

The company's measure of profit/loss for segment reporting purposes remains unchanged - Segment operating profit. Segment operating profit is defined as operating profit excluding purchase accounting impacts of the Linde AG merger, intercompany royalties, and items not indicative of ongoing business trends. This is the manner in which the company's CODM assesses performance and allocates resources. Similarly, total assets have not been included as this is not provided to the CODM for their assessment. For a description of Linde's previous operating segments, refer to Note 20 to the consolidated financial statements of Linde's 2018 Annual Report on Form 10-K.

The table below presents information about reportable segments for the years ended December 31, 2019, 2018 and 2017. The year ended December 31, 2019 reflects the results of both Praxair and Linde AG for the entire year. The year ended December 31, 2018 reflects the results of Praxair for the entire year and the results of Linde AG for the period beginning after October 31, 2018 (the merger date), including the impacts of purchase accounting (See Notes 1, 3 and 4 to the consolidated financial statements). The historical periods prior to 2018 reflect the results of Praxair. Prior periods presented have been recast to be consistent with the new segment structure:

(Millions of dollars)	2019	2018	2017
Sales (a)			
Americas	$ 10,993	$ 8,017	$ 7,204
EMEA	6,643	2,644	1,520
APAC	5,839	2,446	1,571
Engineering	2,799	459	N/A
Other	1,954	1,270	1,063
Total Sales	$ 28,228	$ 14,836	$ 11,358

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	2019	2018	2017
Operating Profit			
Americas	$ 2,578	$ 2,053	$ 1,854
EMEA	1,367	481	317
APAC	1,198	465	329
Engineering	390	14	N/A
Other	(245)	(37)	(4)
Segment operating profit	5,288	2,976	2,496
Cost reduction programs and other charges	(567)	(309)	(52)
Net gain on sale of business	164	3,294	N/A
Purchase accounting impacts - Linde AG	(1,952)	(714)	N/A
Total operating profit	$ 2,933	$ 5,247	$ 2,444

	2019	2018	2017
Depreciation and Amortization			
Americas	$ 1,195	$ 860	$ 778
EMEA	749	269	168
APAC	613	271	178
Engineering	35	5	N/A
Other	143	79	60
Segment depreciation and amortization	2,735	1,484	1,184
Purchase accounting impacts - Linde AG	1,940	346	N/A
Total depreciation and amortization	$ 4,675	$ 1,830	$ 1,184

	2019	2018	2017
Capital Expenditures and Acquisitions			
Americas	$ 1,814	$ 1,068	$ 921
EMEA	738	329	141
APAC	1,231	372	207
Engineering	79	27	N/A
Other	45	112	75
Total Capital Expenditures and Acquisitions	$ 3,907	$ 1,908	$ 1,344

	2019	2018	2017
Sales by Major Country			
United States	$ 8,604	$ 5,942	$ 4,973
Germany	3,630	868	401
China	2,005	1,032	735
United Kingdom	1,653	398	131
Australia	1,127	183	N/A
Brazil	994	1,003	1,100
Other – foreign	10,215	5,410	4,018
Total Sales by Major Country	$ 28,228	$ 14,836	$ 11,358

	2019	2018	2017
Long-lived Assets by Major Country (b)			
United States	$ 7,498	$ 7,189	$ 4,979
Germany	2,429	2,411	413
China	2,254	2,237	1,060
United Kingdom	1,479	1,582	55
Australia	1,214	1,476	N/A
Brazil	956	1,012	1,204
Other – foreign	13,234	13,810	4,114
Total long-lived assets	$ 29,064	$ 29,717	$ 11,825

(a) Sales reflect external sales only and include Linde AG sales from the merger date of October 31, 2018 forward. Intersegment sales, primarily from Engineering to the industrial gases segments, were not material.

(b) Long-lived assets include property, plant and equipment - net and reflect the impact of the merger with Linde AG (refer to Note 3).

21. REVENUE RECOGNITION

Revenue is accounted for in accordance with ASC 606. Revenue is recognized as control of goods or services are transferred to customers in an amount that reflects the consideration to which an entity expects to be entitled to receive in exchange for the goods or services.

Contracts with Customers

Approximately 83% of Linde's consolidated sales are generated from industrial gases and related products in three geographic segments (Americas, EMEA, and APAC) and the remaining 17% is related primarily to the Engineering segment, and to a lesser extent Other (see Note 20 for operating segment details). Linde serves a diverse group of industries including healthcare, energy, manufacturing, food, beverage carbonation, fiber-optics, steel making, aerospace, chemicals and water treatment.

Industrial Gases

Within each of the company's geographic segments for industrial gases, there are three basic distribution methods: (i) on-site or tonnage; (ii) merchant or bulk liquid; and (iii) packaged or cylinder gases. The distribution method used by Linde to supply a customer is determined by many factors, including the customer's volume requirements and location. The distribution method generally determines the contract terms with the customer and, accordingly, the revenue recognition accounting practices. Linde's primary products in its industrial gases business are atmospheric gases (oxygen, nitrogen, argon, rare gases) and process gases (carbon dioxide, helium, hydrogen, electronic gases, specialty gases, acetylene). These products are generally sold through one of the three distribution methods.

Following is a description of each of the three industrial gases distribution methods and the respective revenue recognition policies:

On-site. Customers that require the largest volumes of product and that have a relatively constant demand pattern are supplied by cryogenic and process gas on-site plants. Linde constructs plants on or adjacent to these customers' sites and supplies the product directly to customers by pipeline. Where there are large concentrations of customers, a single pipeline may be connected to several plants and customers. On-site product supply contracts generally are total requirement contracts with terms typically ranging from 10-20 years and contain minimum purchase requirements and price escalation provisions. Many of the cryogenic on-site plants also produce liquid products for the merchant market. Therefore, plants are typically not dedicated to a single customer. Additionally, Linde is responsible for the design, construction, operations and maintenance of the plants and our customers typically have no involvement in these activities. Advanced air separation processes also allow on-site delivery to customers with smaller volume requirements.

The company's performance obligations related to on-site customers are satisfied over time as customers receive and obtain control of the product. Linde has elected to apply the practical expedient for measuring progress towards the completion of a performance obligation and recognizes revenue as the company has the right to invoice each customer, which generally corresponds with product delivery. Accordingly, revenue is recognized when product is delivered to the customer and the company has the right to invoice the customer in accordance with the contract terms. Consideration in these contracts is generally based on pricing which fluctuates with various price indices. Variable components of consideration exist within on-site contracts but are considered constrained.

Merchant. Merchant deliveries generally are made from Linde's plants by tanker trucks to storage containers at the customer's site. Due to the relatively high distribution cost, merchant oxygen and nitrogen generally have a relatively small distribution radius from the plants at which they are produced. Merchant argon, hydrogen and helium can be shipped much longer distances. The customer agreements used in the merchant business are usually three to seven year supply agreements based on the requirements of the customer. These contracts generally do not contain minimum purchase requirements or volume commitments.

The company's performance obligations related to merchant customers are generally satisfied at a point in time as the customers receive and obtain control of the product. Revenue is recognized when product is delivered to the customer and the company has the right to invoice the customer in accordance with the contract terms. Any variable components of consideration within merchant contracts are constrained however this consideration is not significant.

Packaged Gases. Customers requiring small volumes are supplied products in containers called cylinders, under medium to high pressure. Linde distributes merchant gases from its production plants to company-owned cylinder filling plants where cylinders are then filled for distribution to customers. Cylinders may be delivered to the customer's site or picked up by the customer at a packaging facility or retail store. Linde invoices the customer for the industrial gases and the use of the cylinder container(s). The company also sells hardgoods and welding equipment purchased from independent manufacturers. Packaged gases are generally sold under one to three-year supply contracts and purchase orders and do not contain minimum purchase requirements or volume commitments.

The company's performance obligations related to packaged gases are satisfied at a point in time. Accordingly, revenue is recognized when product is delivered to the customer or when the customer picks up product from a packaged gas facility or retail store, and the company has the right to payment from the customer in accordance with the contract terms. Any variable consideration is constrained and will be recognized when the uncertainty related to the consideration is resolved.

Linde Engineering

The company designs and manufactures equipment for air separation and other industrial gas applications manufactured specifically for end customers. Sale of equipment contracts are generally comprised of a single performance obligation. Revenue from sale of equipment is generally recognized over time as Linde has an enforceable right to payment for performance completed to date and performance does not create an asset with alternative use. For contracts recognized over time, revenue is recognized primarily using a cost incurred input method. Costs incurred to date relative to total estimated costs at completion are used to measure progress toward satisfying performance obligations. Costs incurred include material, labor, and overhead costs and represent work contributing and proportionate to the transfer of control to the customer. Contract modifications are typically accounted for as part of the existing contract and are recognized as a cumulative adjustment for the inception-to-date effect of such change.

Contract Assets and Liabilities

Contract assets and liabilities result from differences in timing of revenue recognition and customer invoicing. Contract assets primarily relate to sale of equipment contracts for which revenue is recognized over time. The balance represents unbilled revenue which occurs when revenue recognized under the measure of progress exceeds amounts invoiced to customers. Customer invoices may be based on the passage of time, the achievement of certain contractual milestones or a combination of both criteria. Contract liabilities include advance payments or right to consideration prior to performance under the contract. Contract liabilities are recognized as revenue as performance obligations are satisfied under contract terms. Linde has contract assets of $368 million at December 31, 2019. Total contract liabilities are $2,106 million at December 31, 2019 (current of $1,758 million and $348 million within other long-term liabilities in the consolidated balance sheets). Total contract liabilities were $1,934 million at December 31, 2018 (current contract liabilities of $1,546 million, $234 million classified as deferred income within other current liabilities and $154 million in other long-term liabilities in the consolidated balance sheets). Revenue recognized for the twelve months ended December 31, 2019 that was included in the contract liability at December 31, 2018 was $1,168 million. Contract assets and liabilities primarily relate to the Linde Engineering business acquired in the merger. The industrial gases business does not typically have material contract assets or liabilities.

Payment Terms and Other

Linde generally receives payment after performance obligations are satisfied, and customer prepayments are not typical for the industrial gases business. Payment terms vary based on the country where sales originate and local customary payment practices. Linde does not offer extended financing outside of customary payment terms. Amounts billed for sales and use taxes, value-added taxes, and certain excise and other specific transactional taxes imposed on revenue producing transactions are presented on a net basis and are not included in sales within the consolidated statement of income. Additionally, sales returns and allowances are not a normal practice in the industry and are not significant.

Disaggregated Revenue Information

As described above and in Note 20, the company manages its industrial gases business on a geographic basis, while the Engineering and Other businesses are generally managed on a global basis. Furthermore, the company believes that reporting sales by distribution method by reportable geographic segment best illustrates the nature, timing, type of customer, and contract terms for its revenues, including terms and pricing.

The following tables show sales by distribution method at the consolidated level and for each reportable segment and Other for the years ended December 31, 2019 and 2018. The year ended December 31, 2019 reflects the results of both Praxair and Linde AG for the entire year. The year ended December 31, 2018 reflects the results of Praxair for the entire year and the results of Linde AG for the period beginning after October 31, 2018 (the merger date),

(Millions of dollars)	Year Ended December 31, 2019						
Sales	**Americas**	**EMEA**	**APAC**	**Engineering**	**Other**	**Total**	**%**
Merchant	$ 2,946	$ 1,856	$ 2,080	$ —	$ 184	$ 7,066	25 %
On-Site	2,758	1,434	2,060	—	—	6,252	22 %
Packaged Gas	5,185	3,347	1,562	—	19	10,113	36 %
Other	104	6	137	2,799	1,751	4,797	17 %
	$ 10,993	$ 6,643	$ 5,839	$ 2,799	$ 1,954	$ 28,228	100 %

(Millions of dollars)	Year Ended December 31, 2018						
Sales	**Americas**	**EMEA**	**APAC**	**Engineering**	**Other**	**Total**	**%**
Merchant	$ 2,775	$ 832	$ 826	$ —	$ 119	$ 4,552	31 %
On-Site	2,405	536	1,156	—	—	4,097	28 %
Packaged Gas	2,800	1,271	443	—	3	4,517	30 %
Other	37	5	21	459	1,148	1,670	11 %
	$ 8,017	$ 2,644	$ 2,446	$ 459	$ 1,270	$ 14,836	100 %

Remaining Performance Obligations

As described above, Linde's contracts with on-site customers are under long-term supply arrangements which generally require the customer to purchase their requirements from Linde and also have minimum purchase requirements. The company estimates the consideration related to minimum purchase requirements is approximately $48 billion. This amount excludes all sales above minimum purchase requirements, which can be significant depending on customer needs. In the future, actual amounts will be different due to impacts from several factors, many of which are beyond the company’s control including, but not limited to, timing of newly signed, terminated and renewed contracts, inflationary price escalations, currency exchange rates, and pass-through costs related to natural gas and electricity. The actual duration of long-term supply contracts ranges up to twenty years. The company estimates that approximately half of the revenue related to minimum purchase requirements will be earned in the next five years and the remaining thereafter.

NOTE 22. QUARTERLY DATA (UNAUDITED)

(Dollar amounts in millions, except per share data)

2019	1Q (a)	2Q (a)	3Q (a)	4Q (a)	YEAR (a)
Sales	$ 6,944	$ 7,204	$ 7,000	$ 7,080	$ 28,228
Cost of sales, exclusive of depreciation and amortization	4,116	4,280	4,061	4,187	16,644
Depreciation and amortization	1,223	1,195	1,095	1,162	4,675
Operating profit	609	669	1,000	655	2,933
Net income – Linde plc	517	522	735	511	2,285
Income from continuing operations	435	513	728	507	2,183
Income from discontinued operations	82	9	7	4	102
Basic Per Share Data					
Income from continuing operations	$ 0.80	$ 0.95	$ 1.35	$ 0.94	$ 4.03
Income from discontinued operations	0.15	0.02	0.01	0.01	0.19
Weighted average shares (000's)	545,554	542,561	539,753	536,768	541,094
Diluted Per Share Data					
Income from continuing operations	$ 0.79	$ 0.94	$ 1.34	$ 0.94	$ 4.00
Income from discontinued operations	0.15	0.02	0.01	0.01	0.19
Weighted average shares (000's)	549,147	546,488	543,616	540,919	545,170

2018	1Q (a)	2Q (a)	3Q (a)	4Q (a)	YEAR (a)
Sales	$ 2,983	$ 3,044	$ 3,008	$ 5,801	$ 14,836
Cost of sales, exclusive of depreciation and amortization	1,661	1,706	1,698	3,955	9,020
Depreciation and amortization	311	311	306	902	1,830
Operating profit	653	689	669	3,236	5,247
Net income – Linde plc	462	480	461	2,978	4,381
Income from continuing operations	462	480	461	2,870	4,273
Income from discontinued operations	—	—	—	108	108
Basic Per Share Data					
Income from continuing operations*	$ 1.61	$ 1.67	$ 1.60	$ 6.27	$ 12.93
Income from discontinued operations*	—	—	—	0.24	0.33
Weighted average shares (000's)	287,504	287,803	288,093	457,518	330,401
Diluted Per Share Data					
Income from continuing operations*	$ 1.59	$ 1.65	$ 1.58	$ 6.22	$ 12.79
Income from discontinued operations*	—	—	—	0.23	0.32
Weighted average shares (000's)	290,809	290,908	291,513	461,150	334,127

* Due to quarterly changes in the share count as a result of the merger the sum of the four quarters does not equal the earnings per share amount calculated for the year.

(a) 2019 and 2018 include the impact of the following matters (see Notes 3, 4, 5, 7, 13 and 18):

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(Millions of dollars)	Operating Profit/ (Loss)	Income from Continuing Operations
Q1		
Cost reduction programs and other charges	$ (89)	$ (81)
Pension settlement charge	—	(38)
Purchase accounting impacts - Linde AG	(531)	(378)
Q2		
Cost reduction programs and other charges	(141)	(123)
Purchase accounting impacts - Linde AG	(515)	(368)
Q3		
Cost reduction programs and other charges	(125)	(91)
Pension settlement charge	—	(30)
Purchase accounting impacts - Linde AG	(425)	(312)
Gain on sale of business	164	108
Q4		
Cost reduction programs and other charges	(212)	(160)
Pension settlement charge	—	(4)
Purchase accounting impacts - Linde AG	(481)	(354)
Year 2019	$ (2,355)	$ (1,831)

(Millions of dollars)	Operating Profit/ (Loss)	Income from Continuing Operations
Q1		
Cost reduction programs and other charges	$ (19)	$ (18)
Q2		
Cost reduction programs and other charges	(24)	(21)
Q3		
Cost reduction programs and other charges	(31)	(29)
Pension settlement charge	—	(3)
Q4		
Cost reduction programs and other charges	(235)	(238)
Gain on sale of business	3,294	2,923
Bond redemption	—	(20)
Pension settlement charge	—	(8)
Tax Act and other tax charges	—	17
Purchase accounting impacts - Linde AG	(714)	(451)
Year 2018	$ 2,271	$ 2,152

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

None.

ITEM 9A. CONTROLS AND PROCEDURES

Conclusion Regarding the Effectiveness of Disclosure Controls and Procedures

Based on an evaluation of the effectiveness of Linde's disclosure controls and procedures, which was made under the supervision and with the participation of management, including Linde's principal executive officer and principal financial officer, the principal executive officer and principal financial officer have each concluded that, as of the end of the annual period covered by this report, such disclosure controls and procedures are effective in ensuring that information required to be disclosed by Linde in reports that it files or submits under the Exchange Act of 1934 is recorded, processed, summarized and reported within the time periods specified in the Securities and Exchange Commission's rules and forms, and accumulated and communicated to management including Linde's principal executive officer and principal financial officer, to allow timely decisions regarding required disclosure.

Management's Report on Internal Control Over Financial Reporting

Refer to Item 8 for Management's Report on Internal Control Over Financial Reporting as of December 31, 2019.

Changes in Internal Control over Financial Reporting

There were no changes in Linde's internal control over financial reporting that occurred during the quarter ended December 31, 2019 that have materially affected, or are reasonably likely to materially affect, Linde's internal control over financial reporting.

ITEM 9B. OTHER INFORMATION

None.

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

Certain information required by this item is incorporated herein by reference to the sections captioned “Corporate Governance and Board Matters - Director Nominees" and “Corporate Governance And Board Matters - "Delinquent Section 16 (a) Reports" in Linde’s Proxy Statement to be filed by April 30, 2020 for the Annual General Meeting.

Identification of the Audit Committee

Linde has a separately-designated standing Audit Committee established in accordance with Section 3(a)(58)(A) of the Securities Exchange Act of 1934 as amended (the “Exchange Act”). The members of that audit committee are Prof. Dr. Clemens Börsig (chairman), Dr. Nance K. Dicciani, Dr. Thomas Enders, Edward G. Galante, Larry D. McVay and Dr. Victoria Ossadnik, and each member is independent within the meaning of the independence standards adopted by the Board of Directors and those of the New York Stock Exchange.

Audit Committee Financial Expert

The Linde Board of Directors has determined that Prof. Dr. Clemens Börsig is an “audit committee financial expert” as defined by Item 407(d)(5)(ii) of Regulation S-K of the Exchange Act and is independent within the meaning of the independence standards adopted by the Board of Directors and those of the New York Stock Exchange.

Code of Ethics

Linde has adopted a code of ethics that applies to the company’s directors and all employees, including its Chief Executive Officer, Chief Financial Officer, and Chief Accounting Officer. This code of ethics, including specific standards for implementing certain provisions of the code, has been approved by the Linde Board of Directors and is named the “Code of Business Integrity”. This document is posted on the company’s public website, www.linde.com but is not incorporated herein.

ITEM 11. EXECUTIVE COMPENSATION

Information required by this item is incorporated herein by reference to the sections captioned “Executive Compensation Matters” and “Corporate Governance and Board Matters - Director Compensation” in Linde’s Proxy Statement to be filed by April 30, 2020 for the Annual General Meeting.

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ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

Equity Compensation Plans Information - The table below provides information as of December 31, 2019 about company shares that may be issued upon the exercise of options, warrants and rights granted to employees or members of Linde's Board of Directors under equity compensation plans that were assumed by Linde upon the completion of the business combination on October 31, 2018.

EQUITY COMPENSATION PLANS TABLE

Plan Category	Number of securities to be issued upon exercise of outstanding options, warrants and rights		Weighted-average exercise price of outstanding options, warrants and rights	Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in column	
Equity compensation plans approved by shareholders	10,426,688	(1)	$ 127.04	6,715,222	(2)
Equity compensation plans not approved by shareholders	—		—	—	
Total	10,426,688		$ 127.04	6,715,222	

(1) This amount includes 883,922 restricted shares and 246,220 performance shares.

(2) This amount includes 6,454,428 shares available for future issuance pursuant to the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan assumed by Linde, and 260,794 shares available for future issuance pursuant to the Long Term Incentive Plan 2018 of Linde plc.

Certain information required by this item regarding the beneficial ownership of the company's ordinary shares is incorporated herein by reference to the section captioned "Information on Share Ownership" in Linde's Proxy Statement to be filed by April 30, 2020 for the Annual General Meeting.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS AND DIRECTOR INDEPENDENCE

Information required by this item is incorporated herein by reference to the sections captioned "Corporate Governance And Board Matters – Review, Approval or Ratification of Transactions with Related Persons," "Corporate Governance And Board Matters – Certain Relationships and Transactions," and "Corporate Governance And Board Matters – Director Independence" in Linde's Proxy Statement to be filed by April 30, 2020 for the Annual General Meeting.

ITEM 14. PRINCIPAL ACCOUNTING FEES AND SERVICES

Information required by this item is incorporated herein by reference to the section captioned "Audit Matters" in Linde's Proxy Statement to be filed by April 30, 2020 for the Annual General Meeting.

PART IV

ITEM 15. EXHIBITS, FINANCIAL STATEMENT SCHEDULES

(a) The following documents are filed as part of this report:

(1) The company’s 2019 Consolidated Financial Statements and the Report of the Independent Registered Public Accounting Firm are included in Part II, Item 8. Financial Statements and Supplementary Data.

(2) Financial Statement Schedules – All financial statement schedules have been omitted because they are not applicable or the required information is shown in the financial statements or notes thereto.

(3) Exhibits – The exhibits filed as part of this Annual Report on Form 10-K are listed in the accompanying index.

INDEX TO EXHIBITS

Linde plc and Subsidiaries

Exhibit No.	Description
2.1	Business Combination Agreement by and among Linde Aktiengesellschaft, Praxair, Inc., Zamalight PLC, Zamalight Holdco LLC and Zamalight Subco, Inc. dated as of June 1, 2017 (Filed as Exhibit 2.1 to Praxair, Inc.'s Current Report on Form 8-K dated June 1, 2017, Filing No. 1-11037, and is incorporated herein by reference.)
2.1a	Amendment No. 1, dated August 10, 2017, to the Business Combination Agreement, by and among Praxair, Inc., Linde Aktiengesellschaft, Linde plc, Zamalight Holdco LLC and Zamalight Subco, Inc. (Filed as Exhibit 2.1 to Praxair, Inc.'s Current Report on Form 8-K dated August 10, 2017, Filing No. 1-11037, and is incorporated hereby by reference.)
**2.2	Sale and Purchase Agreement, dated July 5, 2018, by and among Praxair, Inc., Taiyo Nippon Sanso Corporation (“Taiyo”), and Linde plc with respect to the sale of a majority of Praxair’s businesses in Europe to Taiyo in connection with the Business Combination Agreement (Filed as Exhibit 2.1 to the Company’s Quarterly Report on Form 10-Q for the quarter ended September 30, 2018, File No. 1-38730, and is incorporated hereby by reference).
**2.3	Sale and Purchase Agreement, dated July 16, 2018, by and among Linde AG, Praxair, Inc., MG Industries GmbH, Messer Canada Inc., MG Industries USA, Inc. (the MG entities and Messer Canada, Inc. being collectively referred to as “Messer”), and Linde plc with respect to the sale of certain assets of Linde AG in the Americas and certain assets of Praxair, Inc. to Messer in connection with the Business Combination Agreement (Filed as Exhibit 2.2 to the Company’s Quarterly Report on Form 10-Q for the quarter ended September 30, 2018, File No. 1-38730, and is incorporated hereby by reference).
**2.3a	First Amendment dated September 21, 2018 to the Sale and Purchase Agreement, dated July 16, 2018, by and among Linde AG, Praxair, Inc., Messer, and Linde plc with respect to the sale of certain additional assets of Linde AG in the Americas to Messer in connection with the Business Combination Agreement (Filed as Exhibit 2.3 to the Company’s Quarterly Report on Form 10-Q for the quarter ended September 30, 2018, File No. 1-38730, and is incorporated hereby by reference).
**2.3b	Second Amendment dated October 19, 2018 to the Sale and Purchase Agreement, dated July 16, 2018, as amended by the First Amendment thereto, by and among Linde AG, Praxair, Inc., Messer, and Linde plc, with respect to the sale of certain additional assets of Linde AG in the Americas to Messer in connection with the Business Combination Agreement (Filed as Exhibit 2.2 to the Company’s Quarterly Report on Form 10-Q for the quarter ended September 30, 2018, File No. 1-11037, and is incorporated hereby by reference).
**2.3c	Third Amendment dated February 20, 2019 to the Sale and Purchase Agreement, dated July 16, 2018, as amended by the First and Second Amendment thereto, by and among Linde AG, Praxair, Inc., Messer, and Linde plc, with respect to the sale of certain additional assets of Linde AG in the Americas to Messer in connection with the Business Combination Agreement dated as of June 1, 2017, as amended, to effect a combination of the businesses of Linde AG and Praxair, Inc. (Filed as Exhibit 2.4 to the Company’s Current Report on Form 8-K, filed on March 7, 2019, File No. 1-11037, and is incorporated hereby by reference).
3.01	Amended and Restated Public Limited Company Constitution of Linde plc (Filed as Exhibit 3.1 to the Company’s Current Report on Form 8-K, filed on October 31, 2018, File No. 333-218485, and incorporated herein by reference).
4.01	Description of Linde plc Ordinary Shares
4.02	Indenture, dated as of July 15, 1992, between Praxair, Inc. and U.S. Bank National Association, as the ultimate successor trustee to Bank of America, Illinois, formerly Continental Bank, National Association (Filed as Exhibit 4 to Praxair, Inc.'s Current Report on Form 8-K dated March 19, 2007, Filing No. 1-11037, and incorporated herein by reference).
4.03	Form of Subordinated Indenture for Praxair, Inc. (Filed as Exhibit 4.3 to Praxair, Inc.'s Form S-3, filed on May 12, 2015, File No. 333-204093, and is incorporated herein by reference.)
4.04	Supplemental Indenture, dated as of September 3, 2019, among Linde plc, Praxair, Inc., Linde AG and U.S. Bank National Association, as trustee (Filed as Exhibit 4.2 to the Linde plc Form 8-K dated September 6, 2019, Filing No. 1-38730, and incorporated herein by reference).
4.05	

Copies of the agreements relating to long-term debt which are not required to be filed as exhibits to this Annual Report on Form 10-K will be furnished to the Securities and Exchange Commission upon request.

10.01	Credit Agreement dated as of March 26, 2019, among Linde plc, certain of its subsidiaries parties thereto as borrowers, the lenders party thereto and Bank of America, N.A., as Administrative Agent (Filed as Exhibit 10.1 to Linde plc's current report on Form 8-K, dated April 3, 2019, Filing No. 1-38730, and incorporated herein by reference).
10.01a	Credit Agreement Additional Guarantor Supplement, dated as of September 3, 2019, by Linde AG, and acknowledged by Bank of America, N.A., as Administrative Agent (Filed as Exhibit 10.2 to the Linde plc Form 8-K dated September 6, 2019, Filing No. 1-38730, and incorporated herein by reference).
*10.02	Long Term Incentive Plan 2018 of Linde plc (Filed as Exhibit 4.4 to the Company's Form S-8, filed on October 31, 2018, File No. 333-228084, and incorporated herein by reference).
*10.03	Linde plc Annual Variable Compensation Plan effective January 1, 2019 (Filed as Exhibit 10.1 to the Company's Current Report on Form 8-K, filed on January 25, 2019, File No. 1-38730, and is incorporated hereby by reference).
*10.04	Form of Executive Severance Compensation Agreement effective January 1, 2009 (Filed as Exhibit 10.02 to Praxair, Inc.'s 2008 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.04a	Form of Amendment, effective December 31, 2012, to Executive Severance Compensation Agreements that were effective January 1, 2009 (Filed as Exhibit 10.1 to Praxair, Inc.'s Current Report on Form 8-K dated December 14, 2012, Filing No. 1-11037, and incorporated herein by reference.
*10.04b	Form of Executive Severance Compensation Agreement effective January 1, 2010 (Filed as Exhibit 10.02 to Praxair, Inc.'s Quarterly Report on Form 10-Q for the quarter ended June 30, 2010, Filing No. 1-11037, and incorporated herein by reference).
*10.04c	Form of Amendment, effective December 31, 2012, to Executive Severance Compensation Agreements that were effective January 1, 2010 (Filed as Exhibit 10.02c to Praxair, Inc.'s 2012 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.04d	Form of Executive Severance Compensation Agreement effective January 1, 2013 (Filed as Exhibit 10.02d to Praxair, Inc.'s 2012 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.04e	Form of Assumption of Praxair, Inc. Executive Severance Compensation Agreement by Linde plc (Filed as Exhibit 10.05e to Linde plc's 2018 Annual Report on Form 10-K, Filing No. 1-38730, and incorporated herein by reference).
*10.05	Praxair, Inc. Supplemental Retirement Income Plan A effective January 1, 2008 (Filed as Exhibit 10.05a to Praxair, Inc.'s 2008 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.05a	First amendment to the Praxair, Inc. Supplemental Retirement Income Plan A effective January 1, 2010 (Filed as Exhibit 10.05b to Praxair, Inc.'s 2009 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.05b	Second Amendment to Praxair, Inc. Supplemental Retirement Income Plan A effective February 28, 2017, (Filed as Exhibit 10.05c to Praxair, Inc.'s 2016 Annual Report on Form 10-K, Filing No. 1-11037, and is incorporated hereby by reference).
*10.05c	Praxair, Inc. Supplemental Retirement Income Plan B amended and restated effective December 31, 2007 (Filed as Exhibit 10.05b to Praxair, Inc.'s 2008 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.05d	First amendment to the Praxair, Inc. Supplemental Retirement Income Plan B effective January 1, 2010 (Filed as Exhibit 10.05d to Praxair, Inc.'s 2009 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.05e	Second Amendment to Praxair, Inc. Supplemental Retirement Income Plan B effective July 1, 2012 (Filed as Exhibit 10.05e to Praxair Inc.'s 2012 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.05f	Third Amendment to Praxair, Inc. Supplemental Retirement Income Plan B effective February 28, 2017, (Filed as Exhibit 10.05g to Praxair, Inc.'s 2016 Annual Report on Form 10-K, Filing No. 1-11037, and is incorporated herein by reference).
*10.06	

	Praxair, Inc. Equalization Benefit Plan amended and restated effective December 31, 2007 (Filed as Exhibit 10.05c to Praxair, Inc.'s 2008 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.06a	First amendment to the Praxair, Inc. Equalization Benefit Plan effective January 1, 2010 (Filed as Exhibit 10.05f to Praxair Inc.'s 2009 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.06b	Second Amendment to the Praxair, Inc. Equalization Benefit Plan effective February 28, 2017,(Filed as Exhibit 10.05j to Praxair, Inc.'s 2016 Annual Report on Form 10-K, Filing No. 1-11037, and is incorporated herein by reference).

*10.06c	Third Amendment to the Praxair, Inc. Equalization Benefit Plan effective December 1, 2017 (Filed as Exhibit 10.05k to Praxair, Inc.'s 2017 Annual Report on Form 10-K, File No. 1-11037, and is incorporated herein by reference).
*10.06d	Fourth Amendment to the Praxair, Inc. Supplemental Retirement Income Plan B effective December 1, 2017 (Filed as Exhibit 10.05l to Praxair, Inc.'s 2017 Annual Report on Form 10-K, File No. 1-11037, and is incorporated herein by reference).
*10.06e	Third Amendment to the Praxair, Inc. Supplemental Retirement Income Plan A effective December 1, 2017 (Filed as Exhibit 10.05m to Praxair, Inc.'s 2017 Annual Report on Form 10-K, File No. 1-11037, and is incorporated herein by reference).
*10.06f	Praxair, Inc. 2018 Equalization Benefit Plan (Filed as Exhibit 99.1 to Praxair, Inc.'s Current Report on Form 8-K filed on October 22, 2018, File No. 1-11037, and incorporated herein by reference).
*10.06g	Praxair, Inc. 2018 Supplemental Retirement Income Plan A (Filed as Exhibit 99.2 to Praxair, Inc.'s Current Report on Form 8-K filed on October 22, 2018, File No. 1-11037, and incorporated herein by reference).
*10.06h	Praxair, Inc. 2018 Supplemental Retirement Income Plan B (Filed as Exhibit 99.3 to Praxair, Inc.'s Current Report on Form 8-K, filed October 22, 2018, File No. 1-11037, and incorporated herein by reference).
*10.07	Praxair, Inc. Director's Fees Deferral Plan amended and restated effective January 26, 2010 (Filed as Exhibit 10.06 to Praxair Inc.'s 2009 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.08	Praxair, Inc. Compensation Deferral Program Amended and Restated as of July 15, 2014 (Filed as Exhibit 10.01 to Praxair, Inc.'s Quarterly Report on Form 10-Q for the quarter ended September 30, 2014, Filing No. 1-11037, and incorporated herein by reference).
*10.08a	First Amendment to the Praxair Compensation Deferral Program effective February 28, 2017,(Filed as Exhibit 10.07a to Praxair, Inc.'s 2016 Annual Report on Form 10-K, Filing No. 1-11037, and is incorporated herein by reference).
*10.09	Service Credit Arrangement for Stephen F. Angel dated May 23, 2007 was filed as Exhibit 10.20 to Praxair, Inc.'s Form 8-K filed on May 24, 2007 and is incorporated herein by reference.
*10.10	Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan (Filed as Exhibit 4.03 to Praxair, Inc.'s Form S-8, filed on October 31, 2018, File No. 333-228084, and incorporated herein by reference).
*10.10a	Form of Standard Option Award under the 2009 Praxair, Inc. Long Term Incentive Plan (Filed as Exhibit 10.22 to Praxair, Inc.'s 2009 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.10b	Form of Transferable Option Award under the 2009 Praxair, Inc. Long Term Incentive Plan (Filed as Exhibit 10.23 to Praxair, Inc.'s 2009 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.10c	First Amendment, dated as of April 25, 2017, to the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan (Filed as Exhibit 10.01 to Praxair, Inc.'s Quarterly Report on Form 10-Q for the quarter ended March 31, 2017, Filing No. 1-11037, and is incorporated herein by reference).

*10.10d	Form of Transferable Option Award under the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan for grants made in 2015-2017 (Filed as Exhibit 10.26 to Praxair, Inc.'s 2014 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.10e	Form of Transferable Option Award under the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan for grants made in 2018 (Filed as Exhibit 10.26a to Praxair, Inc.'s 2017 Annual Report on Form 10-K, File No. 1-11037, and incorporated herein by reference).
*10.10f	Form of Restricted Stock Unit Award under the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan for grants made in 2015 and thereafter (Filed as Exhibit 10.27 to Praxair, Inc.'s 2014 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.10g	Form of Restricted Stock Unit Award under the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan for grants made in 2018 (Filed as Exhibit 10.27a to Praxair, Inc.'s 2017 Annual Report on Form 10-K, File No. 1-11037, and incorporated herein by reference).
*10.10h	Form of Non-Employee Director Restricted Stock Unit Award under the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan (Filed as Exhibit 10.01 to Praxair, Inc.'s Quarterly Report on Form 10-Q for the quarter ended June 30, 2015, Filing No. 1-11037, and incorporated herein by reference).
*10.10i	Form of Non-Employee Director Restricted Stock Unit Award under the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan for grants made in 2019 and thereafter.
*10.10j	Form of Transferable Option Award under the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan for grants beginning in 2019 (Filed as Exhibit 10.11L to Linde plc's 2018 Annual Report on Form 10-K, Filing No. 1-38730, and incorporated herein by reference).
*10.10k	Form of Restricted Stock Unit Award under the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan for grants beginning in 2019 (Filed as Exhibit 10.11M to Linde plc's 2018 Annual Report on Form 10-K, Filing No. 1-38730, and incorporated herein by reference).
*10.10l	Form of Performance Share Unit Award under the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan for grants beginning in 2019 with Return on Capital performance metrics (Filed as Exhibit 10.11N to Linde plc's 2018 Annual Report on Form 10-K, Filing No. 1-38730, and incorporated herein by reference).
*10.10m	Form of Performance Share Unit Award under the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan for grants beginning in 2019 with Total Shareholder Return performance metrics (Filed as Exhibit 10.11O to Linde plc's 2018 Annual Report on Form 10-K, Filing No. 1-38730, and incorporated herein by reference).
*10.11	Form of Employer-Funded Pension Plan Executive Agreement of Linde AG (Filed as Exhibit 10.14 to Linde plc's 2018 Annual Report on Form 10-K, Filing No. 1-38730, and incorporated herein by reference).
*10.12	Form of Linde AG Executive Employment Agreement (Filed as Exhibit 10.15 to Linde plc's 2018 Annual Report on Form 10-K, Filing No. 1-38730, and incorporated herein by reference).
*10.12a	Form of Change Control Appendix to Linde AG Executive Employment Agreement. (Filed as Exhibit 10.15A to Linde plc's 2018 Annual Report on Form 10-K, Filing No. 1-38730, and incorporated herein by reference).
*10.13	Service Agreement by and between Linde Holding GmbH and Mr. Sanjiv Lamba, dated December 20, 2019
*10.13a	Pension Agreement among Linde AG, Linde Holding GmbH and Mr. Sanjiv Lamba, dated December 20, 2019.
*10.14	Form of Linde plc Director Indemnification Agreement (Filed as Exhibit 10.1 to the Company's Current Report on Form 8-K, filed on October 31, 2018, File No. 333-218485, and incorporated herein by reference).
18	Preferability Letter on Change in Accounting Principle

21.01	Subsidiaries of Linde plc
23.01	Consent of Independent Registered Public Accounting Firm.
31.01	Rule 13a-14(a) Certification
31.02	Rule 13a-14(a) Certification
32.01	Section 1350 Certification (such certifications are furnished for the information of the Commission and shall not be deemed incorporated by reference into any filing under the Securities Act or the Exchange Act).
32.02	Section 1350 Certification (such certifications are furnished for the information of the Commission and shall not be deemed incorporated by reference into any filing under the Securities Act or the Exchange Act).
101.INS	XBRL Instance Document: The XBRL Instance Document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document.
101.SCH	XBRL Taxonomy Extension Schema
101.CAL	XBRL Taxonomy Extension Calculation Linkbase
101.LAB	XBRL Taxonomy Extension Label Linkbase
101.PRE	XBRL Taxonomy Extension Presentation Linkbase
101.DEF	XBRL Taxonomy Extension Definition Linkbase

Copies of exhibits incorporated by reference can be obtained from the SEC and are located in SEC File No. 1-11037.

*	Indicates a management contract or compensatory plan or arrangement.
**	Certain schedules or similar attachments have been omitted pursuant to Item 601(b)(2) of Regulation S-K. The Registrant agrees to furnish supplemental copies of any of the omitted schedules or attachments upon request by the SEC.

ITEM 16. FORM 10-K SUMMARY

None.

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SIGNATURES

Linde plc and Subsidiaries

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned thereunto duly authorized.

Linde plc
(Registrant)

Date: March 2, 2020 By: /s/ KELCEY E. HOYT

Kelcey E. Hoyt
Chief Accounting Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the Registrant and in the capacities indicated on March 2, 2020.

/s/ PROF. DR. WOLFGANG REITZLE	/s/ STEPHEN F. ANGEL	/s/ MATTHEW J. WHITE
Wolfgang Reitzle ***Chairman***	**Stephen F. Angel** ***Chief Executive Officer and Director***	**Matthew J. White** ***Chief Financial Officer***
/s/ PROF. DDR. ANN-KRISTIN ACHLIETNER	/s/ DR. CLEMENS BÖRSIG	/s/ DR. NANCE K. DICCIANI
Ann-Kristin Achleitner ***Director***	**Clemens Börsig** ***Director***	**Nance K. Dicciani** ***Director***
/s/ DR. THOMAS ENDERS	/s/ FRANZ FEHRENBACH	/s/ EDWARD G. GALANTE
Thomas Enders ***Director***	**Franz Fehrenbach** ***Director***	**Edward G. Galante** ***Director***
/s/ LARRY D. MCVAY	/s/ DR. VICTORIA OSSADNIK	/s/ PROF. DR. MARTIN H. RICHENHAGEN
Larry D. McVay ***Director***	**Victoria Ossadnik** ***Director***	**Martin Richenhagen** ***Director***
/s/ ROBERT L. WOOD		
Robert L. Wood ***Director***		

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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

FORM 10-K

☑ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the fiscal year ended December 31, 2018

OR

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from to

Commission file number 001-38730

LINDE PLC

(Exact name of registrant as specified in its charter)

Ireland	**98-1448883**
State or other jurisdiction of incorporation or organization	**(I.R.S. Employer Identification No.)**
The Priestley Centre, 10 Priestley Road, Surrey Research Park, Guildford, Surrey GU2 7XY United Kingdom	**+44 1483 242200**
(Address of principal executive offices)	**Registrant's Telephone Number, Including Area Code**

Securities registered pursuant to Section 12(b) of the Act:

Title of each class:	Name of each exchange on which registered:
Ordinary shares (€0.001 nominal value per share)	**New York Stock Exchange**

Securities registered pursuant to Section 12(g) of the Act: None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☑ No ☐

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes ☐ No ☑

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☑ No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☑ No ☐

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§229.405 of this chapter) is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. ☑

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," " smaller reporting company, " and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer ☑ Accelerated filer ☐ Non- accelerated filer ☐ Smaller reporting company ☐ Emerging growth company ☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act). Yes ☐ No ☑

The aggregate market value of the voting and non-voting common stock held by non-affiliates as of June 30, 2018, was approximately $45 billion (based on the closing sale price of the stock of the registrant's predecessor Praxair, Inc. on that date as reported on the New York Stock Exchange).

At February 28, 2019, 544,910,125 ordinary shares of €0.001 nominal value per share of the Registrant were outstanding.

Documents incorporated by reference:

Portions of the Proxy Statement of Linde plc for its 2019 Annual General Meeting of Shareholders, are incorporated in Part III of this report.

LINDE PLC

ANNUAL REPORT ON FORM 10-K
For the fiscal year ended December 31, 2018

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FORWARD-LOOKING STATEMENTS

This document contains "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995. These forward-looking statements are identified by terms and phrases such as: anticipate, believe, intend, estimate, expect, continue, should, could, may, plan, project, predict, will, potential, forecast, and similar expressions. They are based on management's reasonable expectations and assumptions as of the date the statements are made but involve risks and uncertainties. These risks and uncertainties include, without limitation: the ability to successfully integrate the Praxair and Linde AG businesses; regulatory or other requirements imposed as a result of the business combination of Praxair and Linde AG that could reduce anticipated benefits of the transaction; the risk that Linde plc may be unable to achieve expected synergies or that it may take longer or be more costly than expected to achieve those synergies; the performance of stock markets generally; developments in worldwide and national economies and other international events and circumstances, including trade conflicts and tariffs; changes in foreign currencies and in interest rates; the cost and availability of electric power, natural gas and other raw materials; the ability to achieve price increases to offset cost increases; catastrophic events including natural disasters, epidemics and acts of war and terrorism; the ability to attract, hire, and retain qualified personnel; the impact of changes in financial accounting standards; the impact of changes in pension plan liabilities; the impact of tax, environmental, healthcare and other legislation and government regulation in jurisdictions in which the company operates, including the impact of the U.S. Tax Cuts and Jobs Act of 2017; the cost and outcomes of investigations, litigation and regulatory proceedings; the impact of potential unusual or non-recurring items; continued timely development and market acceptance of new products and applications; the impact of competitive products and pricing; future financial and operating performance of major customers and industries served; the impact of information technology system failures, network disruptions and breaches in data security; and the effectiveness and speed of integrating new acquisitions into the business. These risks and uncertainties may cause actual future results or circumstances to differ materially from accounting principles generally accepted in the United States of America, International Financial Reporting Standards or adjusted projections, estimates or other forward-looking statements.

Linde plc assumes no obligation to update or provide revisions to any forward-looking statement in response to changing circumstances. The above listed risks and uncertainties are further described in Item 1A (Risk Factors) in this report, which should be reviewed carefully. Please consider Linde plc's forward-looking statements in light of those risks.

Linde plc and Subsidiaries

PART I

ITEM 1. BUSINESS

General

Linde plc is a public limited company formed under the laws of Ireland with its principal offices in the United Kingdom. Linde plc was formed in 2017 in accordance with the requirements of the business combination agreement, dated June 1, 2017, as amended, between Linde plc, Praxair, Inc. ("Praxair") and Linde Aktiengesellschaft ("Linde AG"). Effective October 31, 2018, the business combination was completed and Linde plc is comprised of the businesses of Praxair and Linde AG (hereinafter the combined group will be referred to as "the company" or "Linde").

The business combination brought together two leading companies in the global industrial gases industry, leveraging the proven strengths of each. Linde believes the merger will combine Linde AG's long-held expertise in technology with Praxair's efficient operating model, thus creating a global leader. The company is expected to enjoy strong positions in key geographies and end markets and will create a more diverse and balanced global portfolio.

Linde is the largest industrial gas company worldwide. It continues to be a major technological innovator in the industrial gases industry. Its primary products in its industrial gases business are atmospheric gases (oxygen, nitrogen, argon, and rare gases) and process gases (carbon dioxide, helium, hydrogen, electronic gases, specialty gases, and acetylene). The company also designs, engineers, and builds equipment that produces industrial gases primarily for internal use and offers its customers a wide range of gas production and processing services such as olefin plants, natural gas plants, air separation plants, hydrogen and synthesis gas plants and other types of plants. The surface technologies segment supplies wear-resistant and high-temperature corrosion-resistant metallic and ceramic coatings and powders.

Linde serves a diverse group of industries including healthcare, petroleum refining, manufacturing, food, beverage carbonation, fiber-optics, steel making, aerospace, chemicals and water treatment.

In 2018, the company, Praxair and Linde AG entered into various agreements with regulatory authorities to satisfy antitrust requirements to secure approval to consummate the business combination. These agreements required the sale of the majority of Praxair's European industrial gases business (completed on December 3, 2018), the majority of Linde AG's Americas industrial gases business (completed on March 1, 2019), as well as certain divestitures of other Praxair and Linde AG businesses in Asia that are expected to be sold in 2019. As of December 31, 2018 and until the completion of the majority of such divestitures, Linde AG and Praxair were obligated to operate their businesses globally as separate and independent companies, and not coordinate any of their commercial operations. The U.S. Federal Trade Commission's (the "FTC") hold separate order ("HSO") restrictions were lifted March 1, 2019, concurrent with the sale of the required merger-related divestitures in the United States. See Notes 4 and 23 to the consolidated financial statements for additional information relating to divestitures.

Praxair was determined to be the accounting acquirer in the business combination. Accordingly, the historical financial statements of Praxair for the periods prior to the business combination are considered to be the historical financial statements of the company. The results of Linde AG are included in Linde's consolidated results from the date of the completion of the business combination forward. Also, during 2018 the company reported its continuing operations in six reporting segments under which it managed its operations, assessed performance, and reported earnings: North America, South America, Asia, Europe, Surface Technologies and Linde AG. Linde AG became the sixth reportable segment effective with the merger on October 31, 2018.

Linde's sales were $14,900 million, $11,437 million, and $10,534 million for 2018, 2017, and 2016, respectively. Refer to Item 7, Management's Discussion and Analysis, for a discussion of consolidated sales and Note 20 to the consolidated financial statements for additional information related to Linde's reportable segments.

Industrial Gases Products and Manufacturing Processes

Atmospheric gases are the highest volume products produced by Linde. Using air as its raw material, Linde produces oxygen, nitrogen and argon through several air separation processes of which cryogenic air separation is the most prevalent. Rare gases, such as krypton, neon and xenon, are also produced through cryogenic air separation. As a pioneer in the industrial gases industry, Linde is a leader in developing a wide range of proprietary and patented applications and supply systems technology. Linde also led the development and commercialization of non-cryogenic air separation technologies for the production of industrial gases. These technologies open important new markets and optimize production capacity for the company by lowering the cost of supplying industrial gases. These technologies include proprietary vacuum pressure swing adsorption ("VPSA") and membrane separation to produce gaseous oxygen and nitrogen, respectively.

Process gases, including carbon dioxide, hydrogen, carbon monoxide, helium, specialty gases and acetylene are produced by methods other than air separation. Most carbon dioxide is purchased from by-product sources, including chemical plants, refineries and industrial processes or is recovered from carbon dioxide wells. Carbon dioxide is processed in Linde's plants to produce commercial and food-grade carbon dioxide. Hydrogen and carbon monoxide can be produced by either steam methane reforming or auto-thermal reforming of natural gas or other feed streams such as naphtha. Hydrogen is also produced by purifying by-product sources obtained from the chemical and petrochemical industries. Most of the helium sold by Linde is sourced from certain helium-rich natural gas streams in the United States, with additional supplies being acquired from outside the United States. Acetylene is primarily sourced as a chemical by-product, but may also be produced from calcium carbide and water.

Industrial Gases Distribution

There are three basic distribution methods for industrial gases: (i) on-site or tonnage; (ii) merchant or bulk liquid; and (iii) packaged or cylinder gases. These distribution methods are often integrated, with products from all three supply modes coming from the same plant. The method of supply is generally determined by the lowest cost means of meeting the customer's needs, depending upon factors such as volume requirements, purity, pattern of usage, and the form in which the product is used (as a gas or as a cryogenic liquid).

On-site. Customers that require the largest volumes of product (typically oxygen, nitrogen and hydrogen) and that have a relatively constant demand pattern are supplied by cryogenic and process gas on-site plants. Linde constructs plants on or adjacent to these customers' sites and supplies the product directly to customers by pipeline. On-site product supply contracts generally are total requirement contracts with terms typically ranging from 10-20 years and containing minimum purchase requirements and price escalation provisions. Many of the cryogenic on-site plants also produce liquid products for the merchant market. Therefore, plants are typically not dedicated to a single customer. Advanced air separation processes allow on-site delivery to customers with smaller volume requirements. Customers using these systems usually enter into requirement contracts with terms typically ranging from 10-20 years.

Merchant. The merchant business is generally associated with distributable liquid oxygen, nitrogen, argon, carbon dioxide, hydrogen and helium. The deliveries generally are made from Linde's plants by tanker trucks to storage containers at the customer's site which are owned and maintained by Linde and leased to the customer. Due to distribution cost, merchant oxygen and nitrogen generally have a relatively small distribution radius from the plants at which they are produced. Merchant argon, hydrogen and helium can be shipped much longer distances. The customer agreements used in the merchant business are usually three-to seven-year requirement contracts.

Packaged Gases. Customers requiring small volumes are supplied products in metal containers called cylinders, under medium to high pressure. Packaged gases include atmospheric gases, carbon dioxide, hydrogen, helium, acetylene and related products. Linde also produces and distributes in cylinders a wide range of specialty gases and mixtures. Cylinders may be delivered to the customer's site or picked up by the customer at a packaging facility or retail store. Packaged gases are generally sold under one to three-year supply contracts and through purchase orders.

A substantial amount of the cylinder gases sold in the United States is distributed by independent distributors that buy merchant gases in liquid form and repackage the products in their facilities. Packaged gas distributors, including Linde, also distribute hardgoods and welding equipment purchased from independent manufacturers. Over time, Linde has acquired a number of independent industrial gases and welding products distributors at various locations in the United States and continues to sell merchant gases to other independent distributors. Between its own distribution business, joint ventures and sales to independent distributors, Linde is represented in 48 states, the District of Columbia and Puerto Rico.

Engineering

Linde's Engineering Division has a global presence, with its focus on market segments such as olefin, natural gas, air separation, hydrogen and synthesis gas plants. The company utilizes its own extensive process engineering know-how in the planning, project development and construction of turnkey industrial plants and associated services. Linde plants are used in a wide variety of fields: in the petrochemical and chemical industries, in refineries and fertilizer plants, to recover air gases, to produce hydrogen and synthesis gases, to treat natural gas and to produce noble gases. The Engineering Division either supplies plant components and services directly to the customer or to the industrial gas business of Linde, which operates the plants on behalf of the customer under a long-term gases supply contract.

Surface Technologies

Surface Technologies is a leading worldwide supplier of coating services and thermal spray consumables to customers in the aircraft, energy, printing, primary metals, petrochemical, textile, and other industries. Its coatings are used to provide wear resistance, corrosion protection, thermal insulation, and many other surface-enhancing functions which serve to extend component life, enable optimal performance, and reduce operating costs. It also manufactures a complete line of electric arc, plasma and wire spray, and high-velocity oxy-fuel ("HVOF") equipment.

Inventories – Linde carries inventories of merchant and cylinder gases, hardgoods and coatings materials to supply products to its customers on a reasonable delivery schedule. On-site plants and pipeline complexes have limited inventory. Inventory obsolescence is not material to Linde’s business.

Customers – Linde is not dependent upon a single customer or a few customers.

International – Linde is a global enterprise with approximately 60% of its 2018 sales outside of the United States. The company also has majority or wholly owned subsidiaries that operate in approximately 45 European, Middle Eastern and African countries (including Germany, France, Sweden, the Republic of South Africa, and the United Kingdom); approximately 20 Asian and South Pacific countries (including China, Taiwan, India and Australia); and approximately 20 Americas countries (including Canada, Mexico and Brazil).

The company also has equity method investments operating in Europe, Asia, Africa, the Middle East, and North America (with the largest located in Germany, China, India, Malaysia, and the United States).

Linde’s international business is subject to risks customarily encountered in foreign operations, including fluctuations in foreign currency exchange rates, import and export controls, and other economic, political and regulatory policies of local governments. Also, see Item 1A. “Risk Factors” and Item 7A. “Quantitative and Qualitative Disclosures About Market Risk.”

Seasonality – Linde’s business is generally not subject to seasonal fluctuations to any significant extent.

Research and Development – Linde’s research and development is directed toward developing new and improved methods for the production and distribution of industrial gases and the development of new markets and applications for these gases. This results in the development of new advanced air separation and hydrogen process technologies and the frequent introduction of new industrial gas applications. Research and development for industrial gases is principally conducted at Pullach, Germany; Tonawanda, New York and Burr Ridge, Illinois.

Linde conducts research and development for its surface technologies to improve the quality and durability of coatings and the use of specialty powders for new applications and industries. Surface Technologies research is conducted at Indianapolis, Indiana.

Patents and Trademarks – Linde owns or licenses a large number of patents that relate to a wide variety of products and processes. Linde’s patents expire at various times over the next 20 years. While these patents and licenses are considered important to its individual businesses, Linde does not consider its business as a whole to be materially dependent upon any one particular patent, or patent license, or family of patents. Linde also owns a large number of trademarks, of which the "Linde" trademark is the most significant.

Raw Materials and Energy Costs – Energy is the single largest cost item in the production and distribution of industrial gases. Most of Linde’s energy requirements are in the form of electricity, natural gas and diesel fuel for distribution. The company mitigates electricity, natural gas, and hydrocarbon price fluctuations contractually through pricing formulas, surcharges, and cost pass–through and tolling arrangements.

The supply of energy has not been a significant issue in the geographic areas where the company conducts business. However, energy availability and price is unpredictable and may pose unforeseen future risks.

For carbon dioxide, carbon monoxide, helium, hydrogen, specialty gases and surface technologies, raw materials are largely purchased from outside sources. Linde has contracts or commitments for, or readily available sources of, most of these raw materials; however, their long-term availability and prices are subject to market conditions.

Competition – Linde participates in highly competitive markets in the industrial gases, engineering and healthcare businesses, which are characterized by a mixture of local, regional and global players, all of which exert competitive pressure on the parties. In locations where Linde has pipeline networks, which enable the company to provide reliable and economic supply of products to larger customers, Linde derives a competitive advantage.

Competitors in the industrial and medical gases industry include global and regional companies such as L'Air Liquide S.A., Air Products and Chemicals, Inc., Messer Group GmbH, Mitsubishi Chemical Holdings Corporation (through Taiyo

Nippon Sanso Corporation) as well as an extensive number of small to medium size independent industrial gas companies which compete locally as producers or distributors. In addition, a significant portion of the international gases market relates to customer-owned plants.

Employees and Labor Relations – As of December 31, 2018, Linde had 80,820 employees worldwide. Linde has collective bargaining agreements with unions at numerous locations throughout the world, which expire at various dates. Linde considers relations with its employees to be good.

Environment – Information required by this item is incorporated herein by reference to the section captioned "Management's Discussion and Analysis – Environmental Matters" in Item 7 of this 10-K.

Available Information – The company makes its periodic and current reports available, free of charge, on or through its website, www.linde.com, as soon as practicable after such material is electronically filed with, or furnished to, the Securities and Exchange Commission ("SEC"). Investors may also access from the company website other investor information such as press releases and presentations. Information on the company's website is not incorporated by reference herein. In addition, the public may read and copy any materials filed with the SEC free of charge at the SEC's website, www.sec.gov, that contains reports, proxy information statements and other information regarding issuers that file electronically.

Executive Officers – The following Executive Officers have been elected by the Board of Directors and serve at the pleasure of the Board. It is expected that the Board will elect officers annually following each annual meeting of shareholders.

Stephen F. Angel, 63, is Chief Executive Officer of Linde. Prior to that, Mr. Angel was Chairman, President and CEO of Praxair, Inc. since 2007. Angel joined Praxair in 2001 as an executive vice president and was named president and chief operating officer in February 2006. Prior to joining Praxair, Angel spent 22 years in a variety of management positions with General Electric. Angel serves on the board of directors of PPG Industries and the U.S.-China Business Council and is a member of The Business Council. Angel received a bachelor of science degree in civil engineering from North Carolina State University and an MBA from Loyola College in Baltimore.

Dr. Christian Bruch, age 49, became an executive officer and a member of the Management Committee of Linde in connection with the business combination in October 2018. He is also the Head of Engineering for Linde and is a member of the Executive Board of Linde AG. Dr. Bruch joined The Linde Group's Gases Division in 2004 as a Business Development Manager for Airgases. In 2006 he became the Head of Tonnage Business Development for air separation projects in Europe, the Middle East and Africa. In 2009 he transferred to the Engineering Division, where he was responsible for the product line Air Separation Plants. In 2013 he was appointed a member of the Board of Directors at the Engineering Division, a position he held until becoming a member of the Executive Board of Linde AG at the beginning of 2015 responsible for the Linde Engineering Division and the Corporate & Support Function Technology & Innovation. Prior to joining The Linde Group, Dr. Bruch worked for the Swiss Institute of Technology in Zürich and for the RWE Group in Essen, Germany.

Bernd Eulitz age 53, became an executive officer and a member of the Management Committee of Linde in connection with the business combination in October 2018. He is also the Head of the Americas. Prior to this, he was appointed a Member of the Executive Board of Linde AG in January 2015, responsible for the Gases Division of Europe, Middle East and Africa. He also led the global functions Centre of Excellence and Procurement. Mr. Eulitz joined Linde AG in 2004 as head of the Sales Region East in Germany. In 2008 he was appointed CEO of PanGas AG in Switzerland and 2011 he moved to Singapore to head the Business Unit South & East Asia covering eleven countries from India to South Korea. Prior to joining Linde AG, Mr. Eulitz worked for Air Liquide and A.T. Kearney in various roles.

Kelcey E. Hoyt, age 50, became the Chief Accounting Officer of Linde in connection with the business combination in October 2018. Prior to this, she served as Vice President and Controller of Praxair, Inc. effective August 1, 2016. Prior to becoming Controller, she served as Praxair's Director of Investor Relations since 2010. She joined Praxair in 2002 and served as Director of Corporate Accounting and SEC Reporting through 2008, and later served as Controller for various divisions within Praxair's North American Industrial Gas business. Previously, she had five years of experience in audit at KPMG, LLP. She is a certified public accountant.

Sanjiv Lamba age 54, became an executive officer and a member of the Management Committee of Linde in connection with the business combination in October 2018. He is the Head of APAC. Mr. Lamba was appointed a Member of the Executive Board of Linde AG in 2011, responsible for the Asia, Pacific segment of the Gases Division, for Global Gases Businesses Helium & Rare Gases, Electronics as well as Asia Joint Venture Management.

Mr. Lamba started his career 1989 with BOC India in Finance where he progressed to become Director of Finance. He was appointed Managing

Director for BOC's India's business in 2001. Throughout his 29 years with BOC/Linde, he has worked in a number of geographies including Germany, the UK, Singapore and India where he has held numerous roles across the organization.

Eduardo F. Menezes, age 55, became an executive officer a member of the Management Committee of Linde in connection with the business combination in October 2018. He is also the Head of EMEA. Mr. Menezes previously served as Executive Vice President of Praxair, Inc. since 2012, responsible for Praxair Europe, Praxair Mexico, Praxair South America and Praxair Asia. From 2010 to March 2011, he was a Vice President of Praxair with responsibility for the North American Industrial Gases business and was named senior vice president in 2011. From 2007 to 2010, he was President of Praxair Europe. He served as Managing Director of Praxair's business in Mexico from 2004 to 2007, as Vice President and General Manager for Praxair Distribution, Inc. from 2003 to 2004 and as Vice President, U.S. West Region, for North American Industrial Gases, from 2000 to 2003.

Anne K. Roby, age 54, became an executive officer and a member of the Management Committee of Linde in connection with the business combination in October 2018. She is the Head of Global Functions. Prior to this, Dr. Roby served as Senior Vice President of Praxair, Inc. since January 1, 2014, responsible for Global Supply Systems, R&D, Global Market Development, Global Operations Excellence, Global Strategic Sales, Global Procurement, Sustainability and Safety, Health and Environment. From 2011to 2013, she served as President of Praxair Asia, responsible for Praxair's industrial gases business in China, India, South Korea and Thailand as well as the electronics market globally. In 2010, Dr. Roby became President of Praxair Electronics, after having served as Vice President, Global Sales, for Praxair from 2009 to 2010. Prior to this, she was Vice President of the Praxair U.S. South Region from 2006 to 2009. Dr. Roby joined Praxair in 1991 as a development associate in the Company's R&D organization and was promoted to other positions of increasing responsibility.

Matt J. White, age 46, became an executive officer and a member of the Management Committee of Linde in connection with the business combination in October 2018. He is the Chief Financial Officer for Linde. He previously served as the Senior Vice President and Chief Financial Officer of Praxair, Inc. since January 1, 2014. Prior to this, Mr. White was President of Praxair Canada from 2011-2014. He joined Praxair in 2004 as finance director for the company's largest business unit, North American Industrial Gases. In 2008, he became Vice President and Controller of Praxair, Inc., then was named Vice President and Treasurer in 2010. Before joining Praxair, White was vice president, finance, at Fisher Scientific and before that he held various financial positions, including group controller, at GenTek, a manufacturing and performance chemicals company.

ITEM 1A. RISK FACTORS

Due to the size and geographic reach of the company's operations, a wide range of factors, many of which are outside of the company's control, could materially affect the company's future operations and financial performance. Management believes the following risks may significantly impact the company:

The company may fail to realize the anticipated strategic and financial benefits sought from the business combination.

The company may not realize all of the anticipated benefits of the business combination between Praxair, Inc. and Linde AG, which was completed on October 31, 2018. The success of the business combination will depend on, among other things, the company's ability to combine Praxair, Inc.'s and Linde AG's businesses in a manner that facilitates growth and realizes the anticipated annual synergies and cost reductions without adversely affecting current revenues and investments in future growth. The actual integration will continue to involve complex operational, technological and personnel-related challenges. Difficulties in the integration of the businesses, which may result in significant costs and delays, include:

- managing a significantly larger combined group;
- aligning and executing the strategy of the company;
- integrating and unifying the offerings and services available to customers and coordinating distribution and marketing efforts in geographically separate organizations;
- coordinating corporate and administrative infrastructures and aligning insurance coverage;
- coordinating accounting, reporting, information technology, communications, administration and other systems;
- addressing possible differences in corporate cultures and management philosophies;
- the company being subject to Irish laws and regulations and legal action in Ireland;
- coordinating the compliance program and uniform financial reporting, information technology and other standards, controls, procedures and policies;
- the implementation, ultimate impact and outcome of post-completion reorganization transactions, such as the squeeze-out with respect to remaining minority Linde AG shareholders, which may be delayed;
- unforeseen and unexpected liabilities related to the business combination or the combined businesses;
- managing tax costs or inefficiencies associated with integrating operations;
- identifying and eliminating redundant and underperforming functions and assets; and
- effecting actions that may be required in connection with obtaining regulatory approvals.

These and other factors could result in increased costs and diversion of management's time and energy, as well as decreases in the amount of expected revenue and earnings. The integration process and other disruptions resulting from the business combination may also adversely affect the company's relationships with employees, suppliers, customers, distributors, licensors and others with whom Praxair, Inc. and Linde AG have business or other dealings, and difficulties in integrating the businesses could harm the reputation of the company.

If the company is not able to successfully integrate the businesses of Praxair, Inc. and Linde AG in an efficient, cost-effective and timely manner, the anticipated benefits and cost savings of the business combination may not be realized fully, or at all, or may take longer to realize than expected.

Weakening economic conditions in markets in which Linde does business may adversely impact its financial results and/or cash flows.

Linde serves a diverse group of industries across more than 100 countries, which generally leads to financial stability through various business cycles. However, a broad decline in general economic or business conditions in the industries served by its customers could adversely affect the demand for Linde's products and impair the ability of its customers to satisfy their obligations to Linde, resulting in uncollected receivables and/or unanticipated contract terminations or project delays. For example, global political and economic uncertainty could reduce investment activities of Linde's customers, which could adversely affect Linde's engineering project business.

In addition, many of Linde's customers are in businesses that are cyclical in nature, such as the chemicals, electronics, metals and energy industries. Downturns in these industries may adversely impact Linde during these cycles. Additionally, such conditions could impact the utilization of Linde's manufacturing capacity which may require it to recognize impairment losses on tangible assets such as property, plant and equipment, as well as intangible assets such as goodwill, customer relationships or intellectual property.

Increases in the cost of energy and raw materials and/or disruption in the supply of these materials could result in lost sales or reduced profitability.

Energy is the single largest cost item in the production and distribution of industrial gases. Most of Linde’s energy requirements are in the form of electricity, natural gas and diesel fuel for distribution. Linde attempts to minimize the financial impact of variability in these costs through the management of customer contracts and reducing demand through operational productivity and energy efficiency. Large customer contracts typically have escalation and pass-through clauses to recover energy and feedstock costs. Such attempts may not successfully mitigate cost variability, which could negatively impact Linde’s financial condition or results of operations. The supply of energy has not been a significant issue in the geographic areas where Linde conducts business. However, regional energy conditions are unpredictable and may pose future risk.

For carbon dioxide, carbon monoxide, helium, hydrogen, specialty gases and surface technologies, raw materials are largely purchased from outside sources. Where feasible, Linde sources several of these raw materials, including carbon dioxide, hydrogen and calcium carbide, as chemical or industrial byproducts. In addition, Linde has contracts or commitments for, or readily available sources of, most of these raw materials; however, their long-term availability and prices are subject to market conditions. A disruption in supply of such raw materials could impact Linde’s ability to meet contractual supply commitments.

Linde’s international operations are subject to the risks of doing business abroad and international events and circumstances may adversely impact its business, financial condition or results of operations.

Linde has substantial international operations which are subject to risks including devaluations in currency exchange rates, transportation delays and interruptions, political and economic instability and disruptions, restrictions on the transfer of funds, trade conflicts and the imposition of duties and tariffs, import and export controls, changes in governmental policies, labor unrest, possible nationalization and/or expropriation of assets, domestic and international tax laws and compliance with governmental regulations. These events could have an adverse effect on the international operations of Linde in the future by reducing the demand for its products, decreasing the prices at which it can sell its products, reducing the revenue from international operations or otherwise having an adverse effect on its business. For example, Linde has a meaningful presence in the U.K. and the U.K.’s ongoing exit process from the EU has continued to cause, and may in the future cause, political and economic uncertainty, which could have an adverse impact on the markets which Linde supplies.

Currency exchange rate fluctuations and other related risks may adversely affect Linde's results.

Because a significant portion of Linde's revenue is denominated in currencies other than its reporting currency, the U.S. dollar, changes in exchange rates will produce fluctuations in revenue, costs and earnings and may also affect the book value of assets and liabilities and related equity. Although the company from time to time utilizes foreign exchange forward contracts to hedge these exposures, its efforts to minimize currency exposure through such hedging transactions may not be successful depending on market and business conditions. As a result, fluctuations in foreign currency exchange rates could adversely affect Linde’s financial condition, results of operations or cash flows.

Macroeconomic factors may impact Linde’s ability to obtain financing or increase the cost of obtaining financing which may adversely impact Linde’s financial results and/or cash flows.

Volatility and disruption in the U.S., European and global credit and equity markets, from time to time, could make it more difficult for Linde to obtain financing for its operations and/or could increase the cost of obtaining financing. In addition, Linde’s borrowing costs can be affected by short- and long-term debt ratings assigned by independent rating agencies which are based, in significant part, on its performance as measured by certain criteria such as interest coverage and leverage ratios. A decrease in these debt ratings could increase the cost of borrowing or make it more difficult to obtain financing.

An impairment of goodwill or intangible assets could negatively impact the company's financial results.

As of December 31, 2018, the net carrying value of goodwill and other indefinite-lived intangible assets was $27 billion and $2 billion, respectively, primarily as a result of the business combination and the related acquisition method of accounting applied to Linde AG. In accordance with generally accepted accounting principles, the company periodically assesses these assets to determine if they are impaired. Significant negative industry or economic trends, disruptions to business, unexpected significant changes or planned changes in use of the assets, divestitures and sustained market capitalization declines may result in recognition of impairments to goodwill or other indefinite-lived assets. Any charges relating to such impairments could have a material adverse impact on Linde's results of operations in the periods recognized.

Catastrophic events could disrupt the operations of Linde and/or its customers and suppliers and may have a significant adverse impact on the results of operations.

The occurrence of catastrophic events or natural disasters such as extreme weather, including hurricanes and floods; health epidemics; and acts of war or terrorism, could disrupt or delay Linde’s ability to produce and distribute its products to customers and could potentially expose Linde to third-party liability claims. In addition, such events could impact Linde’s customers and suppliers resulting in temporary or long-term outages and/or the limitation of supply of energy and other raw materials used in normal business operations. Linde evaluates the direct and indirect business risks, consults with vendors, insurance providers and industry experts, makes investments in suitably resilient design and technology, and conducts regular reviews of the business risks with management. Despite these steps, however, these situations are outside Linde’s control and may have a significant adverse impact on its financial results.

The inability to attract and retain qualified personnel may adversely impact Linde’s business.

If Linde fails to attract, hire and retain qualified personnel, it may not be able to develop, market or sell its products or successfully manage its business. Linde is dependent upon a highly skilled, experienced and efficient workforce to be successful. Much of Linde’s competitive advantage is based on the expertise and experience of key personnel regarding marketing, technology, manufacturing and distribution infrastructure, systems and products. The inability to attract and hire qualified individuals or the loss of key employees in very skilled areas could have a negative effect on Linde’s financial results.

If Linde fails to keep pace with technological advances in the industry or if new technology initiatives do not become commercially accepted, customers may not continue to buy Linde’s products and results of operations could be adversely affected.

Linde’s research and development is directed toward developing new and improved methods for the production and distribution of industrial gases as well as for the design and construction of plants and toward developing new markets and applications for the use of industrial gases. This results in the introduction of new industrial gas applications and the development of new advanced air separation process technologies. As a result of these efforts, Linde develops new and proprietary technologies and employs necessary measures to protect such technologies within the global geographies in which Linde operates. These technologies help Linde to create a competitive advantage and to provide a platform to grow its business. If Linde’s research and development activities do not keep pace with competitors or if Linde does not create new technologies that benefit customers, future results of operations could be adversely affected.

Risks related to pension benefit plans may adversely impact Linde’s results of operations and cash flows.

Pension benefits represent significant financial obligations that will be ultimately settled in the future with employees who meet eligibility requirements. Because of the uncertainties involved in estimating the timing and amount of future payments and asset returns, significant estimates are required to calculate pension expense and liabilities related to Linde’s plans. Linde utilizes the services of independent actuaries, whose models are used to facilitate these calculations. Several key assumptions are used in the actuarial models to calculate pension expense and liability amounts recorded in the consolidated financial statements. In particular, significant changes in actual investment returns on pension assets, discount rates, or legislative or regulatory changes could impact future results of operations and required pension contributions.

Operational risks may adversely impact Linde's business or results of operations.

Linde's operating results are dependent on the continued operation of its production facilities and its ability to meet customer contract requirements and other needs. Insufficient or excess capacity threatens Linde's ability to generate competitive profit margins and may expose Linde to liabilities related to contract commitments. Operating results are also dependent on Linde's ability to complete new construction projects on time, on budget and in accordance with performance requirements. Failure to do so may expose Linde's business to loss of revenue, potential litigation and loss of business reputation.

Also inherent in the management of Linde's production facilities and delivery systems, including storage, vehicle transportation and pipelines, are operational risks that require continuous training, oversight and control. Material operating failures at production, storage facilities or pipelines, including fire, toxic release and explosions, or the occurrence of vehicle transportation accidents could result in loss of life, damage to the environment, loss of production and/or extensive property damage, all of which may negatively impact Linde's financial results.

Linde may be subject to information technology system failures, network disruptions and breaches in data security.

Linde relies on information technology systems and networks for business and operational activities, and also stores and processes sensitive business and proprietary information in these systems and networks. These systems are susceptible to outages due to fire, flood, power loss, telecommunications failures, viruses, break-ins and similar events, or breaches of security.

Linde has taken steps to address these risks and concerns by implementing advanced security technologies, internal controls, network and data center resiliency and recovery process. Despite these steps, however, operational failures and breaches of security from increasingly sophisticated cyber threats could lead to the loss or disclosure of confidential information, result in business interruption or malfunction or regulatory actions and have a material adverse impact on Linde's operations, reputation and financial results.

The inability to effectively integrate acquisitions or collaborate with joint venture partners could adversely impact Linde's financial position and results of operations.

In addition to the business combination, Linde has evaluated and expects to continue to evaluate, a wide array of potential strategic acquisitions and joint ventures. Many of these transactions, if consummated, could be material to its financial condition and results of operations. In addition, the process of integrating an acquired company, business or group of assets may create unforeseen operating difficulties and expenditures. Although historically Linde has been successful with its acquisition strategy and execution, the areas where Linde may face risks include:

- the need to implement or remediate controls, procedures and policies appropriate for a larger public company at companies that prior to the acquisition lacked these controls, procedures and policies;
- diversion of management time and focus from operating existing business to acquisition integration challenges;
- cultural challenges associated with integrating employees from the acquired company into the existing organization;
- the need to integrate each company's accounting, management information, human resources and other administrative systems to permit effective management;
- difficulty with the assimilation of acquired operations and products;
- failure to achieve targeted synergies and cost reductions; and
- inability to retain key employees and business relationships of acquired companies.

Foreign acquisitions and joint ventures involve unique risks in addition to those mentioned herein, including those related to integration of operations across different cultures and languages, currency risks and the particular economic, political and regulatory risks associated with specific countries.

Also, the anticipated benefit of potential future acquisitions may not materialize. Future acquisitions or dispositions could result in the incurrence of debt, contingent liabilities or amortization expenses, or impairments of goodwill, any of which could adversely impact Linde’s financial results.

Linde is subject to a variety of international laws and government regulations and changes in, or failure to comply with, these laws or regulations could have an adverse impact on the company's business, financial position and results of operations.

Linde is subject to regulations in the following areas, among others:

- environmental protection, including climate change and energy efficiency laws and policies;
- domestic and international tax laws and currency controls;
- safety;
- securities laws applicable in the United States, the European Union, Germany, Ireland, and other jurisdictions;
- trade and import/export restrictions, as well as economic sanctions laws;
- antitrust matters;
- data protection;
- global anti-bribery laws, including the U.S. Foreign Corrupt Practices Act; and
- healthcare regulations.

Changes in these or other regulatory areas, such as evolving environmental legislation in China, may impact Linde's profitability and may give rise to new or increased compliance risks: it may become more complex and costly to ensure compliance, and the level of sanctions in the event of non-compliance may rise. Such changes may also restrict Linde's ability to compete effectively in the marketplace. Noncompliance with such laws and regulations could result in penalties or sanctions, cancellation of marketing rights or restrictions on participation in, or even exclusion from, public tender proceedings, all of which could have a material adverse impact on Linde's financial results and/or reputation.

Doing business globally requires Linde to comply with anti-corruption, trade, compliance and economic sanctions and similar laws, and to implement policies and procedures designed to ensure that its employees and other intermediaries comply with the applicable restrictions. These restrictions include prohibitions on the sale or supply of certain products, services and any other economic resources to embargoed or sanctioned countries, governments, persons and entities. Compliance with these restrictions requires, among other things, screening of business partners. Despite its commitment to legal compliance and corporate ethics, the company cannot ensure that its policies and procedures will always protect it from intentional, reckless or negligent acts committed by employees or agents under the applicable laws. If Linde fails to comply with laws governing the conduct of international operations, Linde may be subject to criminal and civil penalties and other remedial measures, which could materially adversely affect its reputation, business and results of operations.

The outcome of litigation or governmental investigations may adversely impact the company's business or results of operations.

Linde's subsidiaries are party to various lawsuits and governmental investigations arising in the ordinary course of business. Adverse outcomes in some or all of the claims pending may result in significant monetary damages or injunctive relief that could adversely affect Linde's ability to conduct business. Linde and its subsidiaries may in the future become subject to further claims and litigation, which is impossible to predict. The litigation and other claims Linde faces are subject to inherent uncertainties. Legal or regulatory judgments or agreed settlements might give rise to expenses which are not covered, or are not fully covered, by insurance benefits and may also lead to negative publicity and reputational damage. An unfavorable outcome or determination could cause a material adverse impact on the company's results of operations.

Potential product defects or inadequate customer care may adversely impact Linde's business or results of operations.

Risks associated with products and services may result in potential liability claims, the loss of customers or damage to Linde’s reputation. Principal possible causes of risks associated with products and services are product defects or an inadequate level of customer care when Linde is providing services.

Linde is exposed to legal risks relating to product liability in the countries where it operates, including countries such as the United States, where legal risks (in particular through class actions) have historically been more significant than in other countries. The outcome of any pending or future products and services proceedings or investigations cannot be predicted and legal or regulatory judgments or agreed settlements may give rise to significant losses, costs and expenses.

The manufacturing and sale of products as well as the construction of plants by Linde may give rise to risks associated with the production, filling, storage, handling and transport of raw materials, goods or waste. Industrial gases are potentially hazardous substances and medical gases and the related healthcare services must comply with the relevant specifications in order to not adversely affect the health of patients treated with them.

Linde's products and services, if defective or not handled or performed appropriately, may lead to personal injuries, business interruptions, environmental damages or other significant damages, which may result, among other consequences, in liability, losses, monetary penalties or compensation payments, environmental clean-up costs or other costs and expenses, exclusion from certain market sectors deemed important for future development of the business and loss of reputation. All these consequences could have a material adverse effect on Linde's business and results of operations.

U.S. civil liabilities may not be enforceable against Linde.

Linde is organized under the laws of Ireland and substantial portions of its assets will be located outside of the United States. In addition, certain directors and officers of Linde and its subsidiaries reside outside the United States. As a result, it may be difficult for investors to effect service of process within the United States upon Linde or such persons, or to enforce outside the United States judgments obtained against such persons in U.S. courts in any action, including actions predicated upon the civil liability provisions of the U.S. federal securities laws. In addition, it may be difficult for investors to enforce, in original actions brought in courts in jurisdictions located outside the United States, rights predicated upon the U.S. federal securities laws.

A judgment for the payment of money rendered by a court in the United States based on civil liability would not be automatically enforceable in Ireland. There is no treaty between Ireland and the United States providing for the reciprocal enforcement of foreign judgments. The following requirements must be met before the foreign judgment will be deemed to be enforceable in Ireland (i) the judgment must be for a definite sum, (ii) the judgment must be final and conclusive; and (iii) the judgment must be provided by a court of competent jurisdiction.

An Irish court will also exercise its right to refuse judgment if the foreign judgment (i) was obtained by fraud; (ii) violated Irish public policy; (iii) is in breach of natural justice; or (iv) if the judgment is irreconcilable with an earlier foreign judgment.

In addition, there is doubt as to whether an Irish court would accept jurisdiction and impose civil liability on Linde or such persons in an original action predicated solely upon the U.S. federal securities laws brought in a court of competent jurisdiction in Ireland against Linde or such member, officer or expert, respectively.

Changes in tax laws or policy could adversely impact the company's financial position or results of operations.

Linde and its subsidiaries are subject to the tax rules and regulations in the U.S., Germany, Ireland, the U.K. and other countries in which they operate. Those tax rules and regulations are subject to change on a prospective or retroactive basis. Under current economic and political conditions, including the U.K.'s ongoing exit process from the EU, tax rates and policies in any jurisdiction, including the U.S., the U.K. and the EU, are subject to significant change. In particular,since Linde is expected to be treated as U.K. tax resident, any potential changes in the tax rules applying to U.K. tax-resident companies would directly affect Linde.

A change in Linde's tax residency could have a negative effect on the company's future profitability, and may trigger taxes on dividends or exit charges. If Linde ceases to be resident in the United Kingdom and becomes resident in another jurisdiction, it may be subject to United Kingdom exit charges, and/or could become liable for additional tax charges in the other jurisdiction. If Linde were to be treated as resident in more than one jurisdiction, it could be subject to duplicative taxation. Furthermore, although Linde is incorporated in Ireland and is not expected to be treated as a domestic corporation for U.S. federal income tax purposes, it is possible that the IRS could disagree with this result or that changes in U.S. federal income tax law could alter this result. If the IRS successfully asserted such a position or the law were to change, significant adverse tax consequences may result for Linde, the company and Linde's shareholders.

When tax rules change, this may result in a higher tax expense and the need to make higher tax payments. In addition, changes in tax legislation may have a significant impact on Linde's and its subsidiaries' tax receivables and tax liabilities as well as on their deferred tax assets and deferred tax liabilities and uncertainty about the tax environment in some regions may restrict their opportunities to enforce their respective rights under the law. Linde will also operate in countries with complex tax regulations which could be interpreted in different ways.

Interpretations of these regulations or changes in the tax system might have an adverse impact on the tax liabilities, profitability and business operations of

Linde. Linde and its subsidiaries are subject to periodic audits by the tax authorities in various jurisdictions or other review actions by the relevant financial or tax authorities. The ultimate tax outcome may differ from the amounts recorded in Linde's or its subsidiaries' financial statements and may materially affect their respective financial results for the period when such determination is made.

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ITEM 1B. UNRESOLVED STAFF COMMENTS

Linde has received no written SEC staff comments regarding any of its Exchange Act reports which remain unresolved.

ITEM 2. PROPERTIES

Linde plc's principal executive offices are located in owned office space in Guildford, United Kingdom. Linde also owns principal administrative office space in Danbury, Connecticut and Tonawanda, New York, United States; Pullach and Dresden, Germany; and Schiedam, Netherlands. Other principal administrative offices are leased in Munich, Germany; Rio de Janeiro, Brazil; Hangzhou and Shanghai, China; Lidingö, Sweden; Basingstoke, United Kingdom; Bridgewater, New Jersey, Houston, Texas and Tulsa, Oklahoma, United States; North Ryde, Australia; Samara, Russia; Vadodara, India; and Singapore.

Due to the nature of Linde’s industrial gas products, it is generally uneconomical to transport them distances greater than a few hundred miles from the production facility. As a result, Linde operates a significant number of production facilities spread globally throughout a number of geographic regions.

The following is a description of production facilities for Linde by segment. No significant portion of these assets was leased at December 31, 2018. Generally, these facilities are fully utilized and are sufficient to meet the Company's manufacturing needs.

North America

The North America segment operates production facilities in the U.S., Canada and Mexico, approximately 260 of which are cryogenic air separation plants, hydrogen plants and carbon dioxide plants. There are five major pipeline complexes in North America located in northern Indiana, Houston, along the Gulf Coast of Texas, Detroit and Louisiana. Also located throughout North America are noncryogenic air separation plants, packaged gas facilities, specialty gas plants, helium plants and other smaller plant facilities.

Europe

On December 3, 2018 Praxair completed the sale of the majority of its European industrial gas business as required for the merger (see Note 4 to the consolidated financial statements). Until the divestiture, the Europe segment had production facilities primarily in Italy, Spain, Germany, the Benelux region, the United Kingdom, Scandinavia and Russia which include approximately 70 cryogenic air separation plants and carbon dioxide plants. There were three major pipeline complexes in Europe located in Northern Spain and the Rhine and Saar regions of Germany. These pipeline complexes were primarily supplied by cryogenic air separation plants. Also located throughout Europe were noncryogenic air separation plants, packaged gas facilities and other smaller plant facilities.

South America

The South America segment operates more than 60 cryogenic air separation plants and carbon dioxide plants, primarily located in Brazil. Many of these plants support a major pipeline complex in Southern Brazil. Also located throughout South America are packaged gas facilities and other smaller plant facilities.

Asia

The Asia segment has production facilities located primarily in China, Korea, India and Thailand, approximately 70 of which are cryogenic air separation plants and carbon dioxide plants. Also located throughout Asia are noncryogenic air separation plants, hydrogen, packaged gas and other production facilities.

Surface Technologies

The Surface Technologies segment provides coating services and manufactures coating equipment at approximately 45 sites. The majority of these sites are located in the United States and Europe, with smaller operations in Asia and Brazil.

Linde AG

Linde AG conducts its operations in approximately 100 countries worldwide. Its gases facilities in Europe Middle East and Africa include approximately 230 plants, of which approximately 150 are cryogenic air separation plants, approximately 50 are hydrogen plants and approximately 30 are carbon dioxide plants. Its current facilities in the Americas include approximately 120 plants, of which approximately 60 are cryogenic air separation plants, approximately 30 are hydrogen plants and approximately 30 are carbon dioxide plants. Its facilities in the Asia/ Pacific include approximately 170 plants, of which approximately 110 are cryogenic air separation plants, approximately 40 are hydrogen plants and

approximately 20 are carbon dioxide plants. Smaller compact plants for air gases are not included in these figures. Additional plants are operated in cooperation with joint-venture partners.

On March 1, 2019 Linde AG completed the sale of a majority of its North American industrial gases business and certain of its South American business activities as required by the merger (see Note 4 to the consolidated financial statements).

The Linde Engineering Division designs and constructs turnkey process plants for third-party customers as well as for the Linde Gases Division in many locations worldwide, such as olefin plants, natural gas plants, air separation plants, hydrogen and synthesis gas plants. Plant components are produced in owned factories in Pullach and Tacherting, Germany; Hesinque, France; Tulsa, Oklahoma, United States; and Dalian, China.

ITEM 3. LEGAL PROCEEDINGS

Information required by this item is incorporated herein by reference to the section captioned “Notes to Consolidated Financial Statements – 19. Commitments and Contingencies” in Item 8 of this 10-K.

ITEM 4. MINE SAFETY DISCLOSURES

Not Applicable

PART II

ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

Linde plc shares trade on the New York Stock Exchange ("NYSE") and the Frankfurt Stock Exchange ("FSE") under the ticker symbol "LIN". At December 31, 2018 there were 10,439 shareholders of record.

Purchases of Equity Securities – Certain information regarding purchases made by or on behalf of the company or any affiliated purchaser (as defined in Rule 10b-18(a)(3) under the Securities Exchange Act of 1934, as amended) of its ordinary shares during the three months ended December 31, 2018 is provided below:

Period	Total Number of Shares Purchased *(Thousands)*	Average Price Paid Per Share	Total Number of Shares Purchased as Part of Publicly Announced Program (1) *(Thousands)*	Approximate Dollar Value of Shares that May Yet be Purchased Under the Program (2) *(Millions)*
October 2018	—	$ —	—	$ —
November 2018	—	$ —	—	$ —
December 2018	4,069	$ 154.48	4,069	$ 371
Fourth Quarter 2018	4,069	$ 154.48	4,069	$ 371

(1) On December 10, 2018 the company's board of directors approved the repurchase of $1.0 billion of its ordinary shares ("2018 program") which could take place from time to time on the open market (which could include the use of 10b5-1 trading plans), subject to market and business conditions. The 2018 program has a maximum repurchase amount of 5% of outstanding shares and a stated expiration date of April 30, 2019.

(2) As of December 31, 2018, the company had purchased $629 million of its ordinary shares pursuant to the 2018 program, leaving an additional $371 million remaining authorized under the 2018 program.

On January 22, 2019 the company's board of directors approved the repurchase of $6.0 billion of its ordinary shares ("2019 program") which could take place from time to time on the open market (which could include the use of 10b5-1 trading plans), subject to market and business conditions. The 2019 program has a maximum repurchase amount of 15% of outstanding shares and a stated expiration date of February 1, 2021.

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Peer Performance Table – The graph below compares the most recent five-year cumulative returns of the common stock of Praxair, the company's predecessor, through October 31, 2018 and Linde's ordinary shares from October 31, 2018 through December 31, 2018 with those of the Standard & Poor’s 500 Index ("SPX") and the S5 Materials Index ("S5MATR") which covers 30 companies, including Linde. The figures assume an initial investment of $100 on December 31, 2013 and that all dividends have been reinvested. chart-6f7b865b7302528dae4.jpg

	2013	**2014**	**2015**	**2016**	**2017**	**2018**
LIN	$100	$102	$83	$97	$132	$136
SPX	$100	$114	$115	$129	$157	$149
S5MATR	$100	$107	$98	$115	$143	$121

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ITEM 6. SELECTED FINANCIAL DATA

FIVE-YEAR FINANCIAL SUMMARY

(Dollar amounts in millions, except per share data)

The year ended December 31, 2018 reflects the results of Praxair for the entire year and the results of Linde AG for the period beginning after October 31, 2018 (the merger date), including the impacts of purchase accounting (See Notes 1, 3 and 4 to the consolidated financial statements). The historical periods prior to 2018 reflect the results of Praxair.

Year Ended December 31,	2018(a)	2017(a)	2016(a)	2015(a)	2014(a)
From the Consolidated Statements of Income					
Sales	$ 14,900	$ 11,437	$ 10,534	$ 10,776	$ 12,273
Cost of sales, exclusive of depreciation and amortization	9,084	6,461	5,855	5,918	6,933
Selling, general and administrative	1,629	1,207	1,145	1,152	1,308
Depreciation and amortization	1,830	1,184	1,122	1,106	1,170
Research and development	113	93	92	93	96
Transaction costs and other charges	309	52	96	165	131
Net gain on sale of business	3,294	—	—	—	—
Other income (expenses) – net	18	4	23	28	9
Operating profit	5,247	2,444	2,247	2,370	2,644
Interest expense – net	202	161	190	161	213
Net pension and OPEB cost (benefit), excluding service cost	(4)	(4)	9	49	36
Income from continuing operations before income taxes and equity investments	5,049	2,287	2,048	2,160	2,395
Income taxes on continuing operations	817	1,026	551	612	691
Income from continuing operations before equity investments	4,232	1,261	1,497	1,548	1,704
Income from equity investments	56	47	41	43	42
Income from continuing operations (including noncontrolling interests)	4,288	1,308	1,538	1,591	1,746
Noncontrolling interests from continuing operations	(15)	(61)	(38)	(44)	(52)
Income from continuing operations	$ 4,273	$ 1,247	$ 1,500	$ 1,547	$ 1,694
Per Share Data – Linde plc Shareholders					
Basic earnings per share from continuing operations	$ 12.93	$ 4.36	$ 5.25	$ 5.39	$ 5.79
Diluted earnings per share from continuing operations	$ 12.79	$ 4.32	$ 5.21	$ 5.35	$ 5.73
Cash dividends per share	$ 3.30	$ 3.15	$ 3.00	$ 2.86	$ 2.60
Weighted Average Shares Outstanding (000's) (b)					
Basic shares outstanding	330,401	286,261	285,677	287,005	292,494
Diluted shares outstanding	334,127	289,114	287,757	289,055	295,608
Other Information and Ratios					
Total assets	$ 93,386	$ 20,436	$ 19,332	$ 18,319	$ 19,769
Total debt	$ 15,296	$ 9,000	$ 9,515	$ 9,231	$ 9,225
Net debt (c)	$ 10,830	$ 8,383	$ 8,991	$ 9,084	$ 9,099
Cash flow from operations	$ 3,654	$ 3,041	$ 2,789	$ 2,695	$ 2,923
Net cash provided by (used for) investing activities	$ 5,363	$ (1,314)	$ (1,770)	$ (1,303)	$ (1,803)
Net cash used for financing activities	$ (4,998)	$ (1,656)	$ (659)	$ (1,310)	$ (1,063)
EBITDA (c)	$ 7,133	$ 3,675	$ 3,410	$ 3,519	$ 3,856
Adjusted EBITDA (c)	$ 4,516	$ 3,727	$ 3,506	$ 3,684	$ 3,987
Capital expenditures	$ 1,883	$ 1,311	$ 1,465	$ 1,541	$ 1,689
Shares outstanding (000's)	547,242	286,777	284,901	284,879	289,262
Number of employees	80,820	26,461	26,498	26,657	27,780

(a) Amounts for 2018 include: (i) charges of $309 million ($306 million after-tax, or $0.92 per diluted share) for transaction costs and other charges primarily related to the merger, (ii) pension settlement charges of $14 million ($11 million after-tax, or $0.03 per diluted share) related to lump sum benefit payments made from pension plans, (iii) income tax benefit, net of $17 million

($0.05 per diluted share) due to U.S. Tax Cuts and Jobs Act and other tax charges, (iv) a net gain on sale of businesses of $3,294 million ($2,923 million after-tax, or $8.75 per diluted share), (v) bond redemption costs of $26 million ($20 million after-tax, or $0.06 per diluted share), and (vi) the purchase accounting impacts of the merger of $714 million ($451 million after-tax and non-controlling interests, or $1.35 per diluted share).

Amounts for 2017 include: (i) charges of $52 million ($48 million after-tax, or $0.17 per diluted share) for transaction costs related to the merger, (ii) a pension settlement charge of $2 million ($1 million after-tax) related to lump sum benefit payments made from an international pension plan, and (iii) income tax charges, net of $394 million ($1.36 per diluted share) due to U.S. Tax Cuts and Jobs Act.

Amounts for 2016 include: (i) a $16 million charge to interest expense ($10 million after–tax, or $0.04 per diluted share) related to the redemption of the $325 million 5.20% notes due 2017, (ii) a pre–tax pension settlement charge of $4 million ($3 million after–tax, or $0.01 per diluted share) related to lump sum benefit payments made from the U.S. supplemental pension plan, and (iii) pre–tax charges of $96 million ($63 million after–tax and non–controlling interests, or $0.22 per diluted share) primarily related to cost reduction actions.

Amounts for 2015 include: (i) a pre-tax charge of $165 million ($125 million after-tax, or $0.43 per diluted share) related to the cost reduction program and other charges; and (ii) a pre-tax charge of $7 million ($5 million after-tax, or $0.02 per diluted share) related to a pension settlement.

Amounts for 2014 include: (i) a pre-tax charge of $131 million ($131 million after-tax, or $0.45 per diluted share) related to the Venezuela currency devaluation, (ii) a pre-tax charge of $7 million ($5 million after-tax, or $0.02 per diluted share) related to pension settlements; and (iii) a pre-tax charge of $36 million ($22 million after-tax, or $0.07 per diluted share) related to a bond redemption.

See Notes 1, 3, 4, 5, 7, 13 and 18 to the consolidated financial statements.

(b) As a result of the merger, share amounts for the year ended December 31, 2018 reflect the weighted averaging effect of Praxair shares outstanding prior to October 31, 2018 and Linde shares outstanding from October 31, 2018 through December 31, 2018.

(c) Non-GAAP measures. See the “Non-GAAP Financial Measures” section in Item 7 for definitions and reconciliation to reported amounts. Net debt, as presented in the table above, is calculated as total debt less cash and cash equivalents.

ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

The following discussion of the company's financial condition and results of operations should be read together with its consolidated financial statements and notes to the consolidated financial statements included in Item 8 of this Form 10-K.

MERGER OF PRAXAIR, INC. AND LINDE AG

On October 31, 2018 Praxair and Linde AG combined their respective businesses through an all-stock transaction, and became subsidiaries of Linde (collectively referred to as the "business combination" or "merger"). Prior to the business combination, the company did not conduct any business activities other than those required for its formation and matters contemplated by the business combination agreement. Praxair was determined to be the accounting acquirer for the merger. Accordingly, the historical financial statements of Praxair for the periods prior to the merger are considered to be the historical financial statements of Linde. The results of Linde AG are included in Linde's consolidated results from the merger date forward. The Linde shares trade on the New York Stock Exchange and the Frankfurt Stock Exchange under the ticker symbol "LIN". See Notes 1 and 3 to the consolidated financial statements for additional information.

In connection with the business combination, the company, Praxair and Linde AG, entered into various agreements with regulatory authorities to satisfy anti-trust requirements to secure approval to consummate the business combination. These agreements required the sale of the majority of Praxair's European businesses (completed on December 3, 2018), the majority of Linde AG's America's business (completed on March 1, 2019), as well as certain divestitures of other Praxair and Linde AG businesses in Asia that are expected to be sold in 2019 (collectively, the "merger-related divestitures"). In the consolidated financial statements, Praxair's merger-related divestitures are included in the results of operations until sold and Linde AG's merger-related divestitures are accounted for as discontinued operations. See Notes 4 and 23 to the consolidated financial statements for additional information relating to merger-related divestitures.

Additionally, to obtain merger approval in the United States Linde, Praxair and Linde AG entered into an agreement with the U.S. Federal Trade Commission dated October 1, 2018 ("hold separate order" or "HSO"). Under the HSO, the company, Praxair and Linde AG agreed to continue to operate Linde AG and Praxair as independent, ongoing, economically viable, competitive businesses held separate, distinct, and apart from each other's operations; and not coordinate any aspect of their operations until certain divestitures in the United States were completed. Accordingly, Linde has accounted for Linde AG as a separate segment for 2018 reporting purposes effective with the merger date. Prior to the merger date, the company's Linde AG segment did not exist. Since the FTC hold separate order restrictions were lifted effective March 1, 2019, the company subsequently implemented a new operating segment structure as follows: Americas; EMEA (Europe/Middle East/Africa); APAC (Asia/Pacific), Engineering and Other. This new management structure will be used for 2019 reporting and comparative prior period information will be presented on a consistent basis.

BUSINESS OVERVIEW

With the merger, Linde is the leading industrial gas company worldwide. The company's primary products in its industrial gases business are atmospheric gases (oxygen, nitrogen, argon, rare gases) and process gases (carbon dioxide, helium, hydrogen, electronic gases, specialty gases, acetylene). The company also designs, engineers, and builds equipment that produces industrial gases primarily for internal use; and offers its customers a wide range of gas production and processing services such as olefin plants, natural gas plants, air separation plants, hydrogen and synthesis gas plants and other types of plants. The company's surface technologies segment supplies wear-resistant and high-temperature corrosion-resistant metallic and ceramic coatings and powders.

Linde's industrial gas operations are managed on a geographical basis and in 2018, 76% of sales were generated by Praxair's four geographic segments (North America, Europe, South America, and Asia), and since the merger date, the Linde AG segment generated 19% of consolidated sales. The surface technologies segment generated the remaining 5% of sales.

Linde serves a diverse group of industries including healthcare, petroleum refining, manufacturing, food, beverage carbonation, fiber-optics, steel making, aerospace, chemicals and water treatment. The diversity of end-markets supports financial stability for Linde in varied business cycles.

Linde generates most of its revenues and earnings in the following geographies where the company has its strongest market positions and where distribution and production operations allow the company to deliver the highest level of service to its customers at the lowest cost.

North and South America ("Americas")	Europe, Middle East and Africa ("EMEA")	Asia and Pacific ("APAC")
United States	Germany	China
Canada	United Kingdom	India
Mexico	Scandinavia	South Korea
Brazil	Republic of South Africa*	Australia/New Zealand*
		Taiwan

*Added with the Linde AG merger

The company manufactures and distributes its products through networks of thousands of production plants, pipeline complexes, distribution centers and delivery vehicles. Major pipeline complexes are primarily located in the United States. These networks are a competitive advantage, providing the foundation of reliable product supply to the company's customer base. The majority of Linde's business is conducted through long-term contracts which provide stability in cash flow and the ability to pass through changes in energy and feedstock costs to customers. The company has growth opportunities in all major geographies and in diverse end-markets such as energy, electronics, chemicals, metals, healthcare, food and beverage, and aerospace.

EXECUTIVE SUMMARY – FINANCIAL RESULTS & OUTLOOK

2018 Year in review

On October 31, 2018 Praxair and Linde AG combined their respective businesses through an all-stock merger transaction, and became subsidiaries of Linde plc. The year ended December 31, 2018 reflects the results of Praxair for the entire year and the results of Linde AG for the period beginning after October 31, 2018.

- Sales of $14,900 million were 30% above 2017 sales of $11,437 million, primarily driven by the merger with Linde AG that contributed 24% to sales, net of divestitures. Underlying sales increased 6% driven by volume growth primarily in North America and Asia, including new project start-ups, and higher price.

- Reported operating profit of $5,247 million was 115% above 2017. Adjusted operating profit of $2,976 million was 19% above adjusted operating profit in 2017. Adjusted operating profit growth was driven by higher volumes and price across the geographic segments and the impact of the merger.*

- Income from continuing operations of $4,273 million and diluted earnings per share from continuing operations of $12.79 increased from $1,247 million and $4.32, respectively in 2017. Adjusted income from continuing operations of $2,121 million and adjusted diluted earnings per share from continuing operations of $6.35 were 26% and 9%, respectively above 2017 adjusted amounts.*

- Cash flow from operations was $3,654 million, or 25% of sales. Capital expenditures were $1,883 million; dividends paid were $1,166 million; and debt repayments, net were $2,908 million.

- Cash on hand at December 31, 2018 was $4,466 million versus $617 million at December 31, 2017. This increase is primarily a result of the stock only merger with Linde AG and proceeds from the sale of Praxair's European industrial gases business. The cash is available for Corporate uses, including among others the planned squeeze-out of the 8% Linde AG noncontrolling interests and stock buybacks.

* A reconciliation of the Adjusted amounts can be found in the "Non-GAAP Financial Measures" section in this MD&A. See Notes 1, 3, 4, 5, 7, 13 and 18 to the consolidated financial statements.

2019 Outlook

The company’s business is to build, own, and operate industrial gas plants in order to supply atmospheric and process gases to customers. As such, Linde believes that its sale of gas project backlog is one indicator of future sales growth. At December 31, 2018, Linde’s backlog of large projects under construction was $3.5 billion. This represents the total estimated capital cost of large plants under construction. APAC and Americas represent 49 percent and 42 percent of the backlog, respectively, with the remaining backlog in EMEA. These plants will primarily supply customers in the energy, chemical, and electronics end-markets.

The above guidance should be read in conjunction with the section entitled “Forward-Looking Statements.”

Linde provides quarterly updates on operating results, material trends that may affect financial performance, and financial guidance via earnings releases and investor teleconferences. These materials are available on the company’s website, https://www.linde.com/en/investors but are not incorporated herein.

CONSOLIDATED RESULTS AND OTHER INFORMATION

The year ended December 31, 2018 reflects the results of Praxair for the entire year and the results of Linde AG for the period beginning after October 31, 2018 (the merger date), including the impacts of purchase accounting (See Notes 1, 3 and 4 to the consolidated financial statements). The historical periods prior to 2018 reflect the results of Praxair, Inc.

The following table provides selected data for 2018, 2017, and 2016:

(Dollar amounts in millions, except per share data) Year Ended December 31,	2018	2017 (d)	2016 (d)	Variance 2018 vs. 2017	Variance 2017 vs. 2016
Reported Amounts					
Sales	$ 14,900	$ 11,437	$ 10,534	30 %	9 %
Cost of sales, exclusive of depreciation and amortization	$ 9,084	$ 6,461	$ 5,855	41 %	10 %
Gross margin (a)	$ 5,816	$ 4,976	$ 4,679	17 %	6 %
As a percent of sales	39.0 %	43.5 %	44.4 %		
Selling, general and administrative	$ 1,629	$ 1,207	$ 1,145	35 %	5 %
As a percent of sales	10.9 %	10.6 %	10.9 %		
Depreciation and amortization	$ 1,830	$ 1,184	$ 1,122	55 %	6 %
Transaction costs and other charges (b)	$ 309	$ 52	$ 96		
Net gain on sale of businesses (b)	$ 3,294	$ —	$ —		
Other income (expense) – net	$ 18	$ 4	$ 23		
Operating Profit	$ 5,247	$ 2,444	$ 2,247	115 %	9 %
Operating margin	35.2 %	21.4 %	21.3 %		
Interest expense – net	$ 202	$ 161	$ 190	25 %	(15)%
Net pension and OPEB cost (benefit), excluding service cost	$ (4)	$ (4)	$ 9	— %	(144)%
Effective tax rate	16.2 %	44.9 %	26.9 %		
Income from equity investments	$ 56	$ 47	$ 41	19 %	15 %
Noncontrolling interests from continuing operations	$ (15)	$ (61)	$ (38)	(75)%	61 %
Income from continuing operations	$ 4,273	$ 1,247	$ 1,500	243 %	(17)%
Diluted earnings per share from continuing operations	$ 12.79	$ 4.32	$ 5.21	196 %	(17)%
Diluted shares outstanding (c)	334,127	289,114	287,757	16 %	— %
Number of employees	80,820	26,461	26,498		
Adjusted Amounts (e)					
Operating profit	$ 2,976	$ 2,496	$ 2,343	19 %	7 %
Operating margin	20.0 %	21.8 %	22.2 %		
Interest expense – net	$ 197	$ 161	$ 174	22 %	(7)%
Net pension and OPEB cost (benefit), excluding service cost	$ (18)	$ (6)	$ 5	200 %	(220)%
Effective tax rate	23.8 %	27.2 %	27.1 %		
Noncontrolling interests from continuing operations	$ (73)	$ (61)	$ (43)	20 %	42 %
Income from continuing operations	$ 2,121	$ 1,690	$ 1,576	26 %	7 %
Diluted earnings per share from continuing operations	$ 6.35	$ 5.85	$ 5.48	9 %	7 %
Other Financial Data (e)					
EBITDA	$ 7,133	$ 3,675	$ 3,410	94 %	8 %
EBITDA Margin	47.9 %	32.1 %	32.4 %	49 %	(1)%
Adjusted EBITDA	$ 4,516	$ 3,727	$ 3,506	21 %	6 %
Adjusted EBITDA Margin	30.3 %	32.6 %	33.3 %	(7)%	(2)%

(a) Gross margin excludes depreciation and amortization expense.

(b) See Notes 5 and 4 to the consolidated financial statements.

(c) As a result of the merger, share amounts for the year ended December 31, 2018 reflect the weighted averaging effect of Praxair shares outstanding prior to October 31, 2018 and Linde shares outstanding from October 31, 2018 through December 31, 2018.

(d) Prior period information has been reclassified to conform with current year presentation as a result of the adoption of new accounting guidance on the presentation of net period pension and postretirement benefit costs. See Note 2 to the consolidated financial statements.

(e) Adjusted amounts and other financial data are non-GAAP performance measures. A reconciliation of reported amounts to adjusted amounts can be found in the "Non-GAAP Financial Measures" section of this MD&A. See Notes 3, 4, 5, 13 and 18 to the consolidated financial statements.

Results of Operations

The following table provides a summary of changes in consolidated sales and adjusted operating profit:

	2018 vs. 2017		2017 vs. 2016	
	% Change		% Change	
	Sales	Operating Profit	Sales	Operating Profit
Factors Contributing to Changes				
Volume	4 %	5 %	5%	8 %
Price/Mix	2 %	9 %	1%	5 %
Cost pass-through	1 %	— %	2%	— %
Currency	(1)%	— %	1%	1 %
Acquisitions/Divestitures				
Europe divestiture	*(1)%*	*(1)%*	—%	— %
Net gain on sale of businesses	*— %*	*132 %*	—%	— %
Linde AG - excluding purchase accounting	*25 %*	*10 %*	—%	— %
Purchase accounting impacts - Linde AG	*— %*	*(29)%*	*—%*	*— %*
Other	— %	(11)%	—%	(5)%
Reported	30 %	115 %	9%	9 %
Transaction costs and other charges	— %	7 %	—%	(2)%
Net gain on sale of businesses	— %	(132)%	—%	— %
Purchase accounting impacts - Linde AG	— %	29 %	—%	— %
Adjusted	30 %	19 %	9%	7 %

The following tables provide consolidated sales by end-market and distribution method:

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	% of Sales*			% Change*	
	2018	2017	2016	2018 vs. 2017	2017 vs. 2016
Sales by End-Markets					
Manufacturing	22 %	22 %	23 %	7 %	4 %
Metals	17 %	17 %	17 %	7 %	7 %
Energy	11 %	12 %	12 %	6 %	5 %
Chemicals	11 %	10 %	10 %	14 %	9 %
Electronics	9 %	9 %	8 %	8 %	13 %
Healthcare	8 %	8 %	8 %	6 %	4 %
Food & Beverage	9 %	9 %	9 %	7 %	5 %
Aerospace	4 %	3 %	3 %	14 %	11 %
Other	9 %	10 %	10 %	(1 %)	3 %
	100 %	100 %	100 %		

* Percentage of sales information excludes Linde AG. Percentage change information excludes impact of currency, natural gas/precious metals cost pass-through and acquisitions/divestitures, including the impact of the Linde AG merger. See Linde AG segment discussion.

	% of Sales*		
	2018	2017	2016
Sales by Distribution Method			
On-Site	28 %	30 %	29 %
Merchant	31 %	34 %	35 %
Packaged Gas	30 %	27 %	28 %
Other	11 %	9 %	8 %
	100 %	100 %	100 %

* See Note 21 to the consolidated financial statements.

2018 Compared With 2017

Sales increased 30% to $14,900 million in 2018 compared to $11,437 million in 2017 primarily reflecting the merger with Linde AG which contributed 24% to sales, net of divestitures. Underlying sales increased 6% driven by higher volumes and pricing. Volume growth of 4% was driven by higher volumes in North America and Asia, including new project start-ups. Higher overall pricing across all geographic segments contributed 2% to sales. Currency translation impact decreased sales by 1%. Higher cost pass-through, primarily natural gas, increased sales by 1% with minimal impact on operating profit. The divestiture of Praxair's European businesses in December of 2018 decreased sales by 1%.

Gross margin increased $840 million, or 17%, versus 2017 primarily due to the merger. Gross margin as a percentage of sales declined to 39.0% in 2018 from 43.5% in 2017 and was negatively impacted by a $368 million charge for the fair value step-up of inventories acquired in the merger. Excluding this charge, gross margin in 2018 was 41.5%.

Selling, general and administrative ("SG&A") expenses increased $422 million, or 35%, in 2018 to $1,629 million primarily due to the merger. SG&A was 10.9% of sales in 2018 versus 10.6% in 2017, primarily due to the merger.

Depreciation and amortization expense increased $646 million, or 55%, versus 2017. The increase is primarily due to the merger, including $346 million of purchase accounting impacts related to the fair value of fixed assets and intangible assets acquired in the merger.

Transaction costs and other charges were $309 million and $52 million in 2018 and 2017, respectively and are primarily related to the merger. See Note 5 to the consolidated financial statements.

Net gain on the sale of businesses was $3,294 million and related primarily to the divestiture of Praxair's European industrial gases business in connection with the merger. See Note 4 to the consolidated financial statements.

Other income (expenses) – net in 2018 was a $18 million benefit versus a $4 million benefit in 2017 (see Note 9 to the consolidated financial statements for a summary of major components). In North America, 2018 included a $30 million asset impairment charge which was more than offset by $43 million of gains on asset disposals. In Asia, 2018 included a $22 million asset impairment charge, offset by a litigation settlement gain.

Reported operating profit of $5,247 million in 2018 was $2,803 million, or 115% higher than reported operating profit of $2,444 million in 2017. 2018 includes a net gain on sale of businesses of $3,294 million, partially offset by transaction costs and other charges of $309 million, and purchase accounting impacts of $714 million related to the Linde AG merger (see Notes 4, 5 and 3, respectively, to the consolidated financial statements). 2017 included transaction costs of $52 million (see Note 5 to the consolidated financial statements). Excluding the impact of these items, adjusted operating profit of $2,976 million in 2018 was $480 million, or 19%, higher than adjusted operating profit of $2,496 million in 2017 driven primarily by the merger. Higher volumes and price in the geographic segments and surface technologies also contributed to operating profit growth. A discussion of operating profit by segment is included in the segment discussion that follows.

Reported interest expense – net in 2018 increased $41 million, or 25%, versus 2017. 2018 included charges of $26 million relating to the early redemption of notes and a decrease of $21 million related to purchase accounting impacts related to the fair value of debt acquired in the merger (see Notes 13 and 3 to the consolidated financial statements, respectively). Excluding these impacts, adjusted interest expense of $197 million increased $36 million, or 22%, largely attributable to interest on the debt acquired in the merger and lower capitalized interest. See Note 9 to the consolidated financial statements for further information relating to interest expense.

The reported effective tax rate ("ETR") for 2018 was 16.2% versus 44.9% in 2017. The decrease in the ETR for the 2018 period versus the U.S. statutory rate of 21% was primarily due to the impact of the sale of Praxair's European industrial gases business. The increase in the ETR for the 2017 period versus the U.S. statutory rate of 35% was primarily due to the net $394 million charge related to the Tax Act. Excluding these and other smaller impacts as set forth in the "Non-GAAP financial measures" section of this MD&A, on an adjusted basis the ETR for the 2018 and 2017 periods was 23.8% and 27.2%, respectively. The decrease was driven primarily by the impact of the Tax Act enacted in the fourth quarter of 2017 which lowered the U.S. statutory tax rate from 35% in 2017 to 21% in 2018 (see Note 7 to the consolidated financial statements).

Linde’s equity investments are primarily located in the United States, China, and the Middle East. Equity income increased $9 million in 2018 versus 2017 and included charges of $9 million for purchase accounting impacts related to the fair value step up of equity investments acquired in the merger. Excluding this impact, equity income increased $18 million, primarily driven by income from equity investments acquired in the merger.

At December 31, 2018, reported noncontrolling interests from continuing operations consisted primarily of noncontrolling shareholders’ investments in Asia (primarily in China) and surface technologies. Reported noncontrolling interests from continuing operations decreased $46 million to $15 million in 2018 from $61 million in 2017. 2018 includes the impact of the merger and related purchase accounting impacts. Excluding these impacts, adjusted noncontrolling interests from continuing operations of $73 million increased $12 million, or 20%, primarily due to noncontrolling interests acquired in the merger.

Reported income from continuing operations for 2018 was $4,273 million, $3,026 million, or 243%, higher than reported income from continuing operations of $1,247 million in 2017. Adjusted income from continuing operations of $2,121 million in 2018 was $431 million, or 26%, higher than adjusted income from continuing operations of $1,690 million in 2017 primarily due to higher adjusted operating profit and a lower effective tax rate.

Reported diluted earnings per share from continuing operations ("EPS") of $12.79 in 2018 increased $8.47 per diluted share, or 196% from $4.32 in 2017. Adjusted diluted EPS of $6.35 in 2018 increased $0.50 per diluted share, or 9%, from adjusted diluted EPS of $5.85 in 2017. The increase in adjusted diluted EPS was primarily due to the merger and higher adjusted income from continuing operations~~,~~ partially offset by an increase in diluted shares resulting from equity acquired in the merger.

Other comprehensive losses for the year ended December 31, 2018 of $299 million resulted primarily from (i) a $221 million unfavorable impact in the funded status of Linde's retirement obligations and (ii) adverse currency translation adjustments of $76 million, net of a benefit of $318 million related to the release of currency translation adjustments on Praxair's European business (See Note 4 to the consolidated financial statements). The decrease in the funded status of retirement obligations was primarily the result of higher current year actuarial losses, as the impact of higher U.S. discount rates was largely offset by a lower actual return on assets. Unfavorable translation adjustments reflect the impact of translating local currency foreign subsidiary financial statements into U.S. dollars, and are largely driven by the strengthening of the U.S. dollar against major currencies including the Euro, Brazilian real and Canadian dollar.

Unfavorable currency translation adjustments included $343 million in South America and $149 million in Asia, partially offset by favorable currency translation adjustments of $231 million related to Linde AG (primarily Europe and Asia) representing translation impacts for the period from merger date through December 31, 2018. Remaining other comprehensive losses of $2 million relate to the amortization of deferred losses on the company's derivatives and unrealized losses on available for sale securities. Refer to the Currency section of the MD&A and Notes 9 and 18 to the consolidated financial statements.

The number of employees at December 31, 2018 was 80,820, an increase of 54,359 employees from December 31, 2017 primarily driven by an increase of approximately 56,000 related to the merger partially offset by a decrease of approximately 2,500 from the divestiture of Praxair's European industrial gases business.

Other Financial Data

Earnings before interest taxes depreciation and amortization ("EBITDA") increased $3,458 million to $7,133 million in 2018 from $3,675 million in 2017. EBITDA in 2018 includes a gain on sale of businesses and purchase accounting impacts, and both periods include transaction and other costs. Excluding the impacts of these items, adjusted EBITDA increased $789 million to $4,516 million in 2018 from $3,727 million in 2017 driven by the consolidation of Linde AG starting October 31, 2018, and higher adjusted income from continuing operations plus depreciation and amortization versus the prior year.

See the “Non-GAAP Financial Measures” section for definitions and reconciliation of these non-GAAP measures to reported amounts.

2017 Compared With 2016

Sales increased 9% to $11,437 million in 2017 compared to $10,534 million in 2016. Excluding favorable currency translation of 1% and higher cost pass-through, primarily natural gas, which increased sales by 2%, sales growth was 6%. Volume growth of 5% was driven by higher volumes in North America, Europe and Asia, including new project start-ups, and growth in all end-markets. Higher price increased sales by 1%.

Gross margin increased $297 million, or 6%, versus 2016 primarily due to higher sales. Gross margin as a percentage of sales declined to 43.5% in 2017 from 44.4% in 2016 largely driven by the contractual pass-through of higher natural gas costs to customers.

Selling, general and administrative expenses increased $62 million or 5% in 2017 to $1,207 million, and decreased to 10.6% of sales versus 10.9% of sales for 2016. Currency impacts increased SG&A by $14 million. Excluding currency impacts, SG&A increased $48 million driven by higher incentive compensation, acquisitions and cost inflation partially offset by cost reduction actions.

Depreciation and amortization expense increased $62 million versus 2016. Currency impacts increased depreciation and amortization expense by $15 million. Excluding currency impacts, depreciation and amortization expense increased $47 million, or 4%, primarily due to large project start ups and acquisitions.

During the year ended December 31, 2017, Linde recorded transaction costs and other charges of $52 million primarily related to the merger. During the year ended December 31, 2016, Linde recorded charges of $96 million related primarily to a cost reduction program. (Refer to Note 5 to the consolidated financial statements.)

Other income (expenses) – net in 2017 was a $4 million benefit versus a $23 million benefit in 2016 (see Note 9 to the consolidated financial statements for a summary of major components). Other income in 2016 is largely related to net gains on asset sales.

Reported operating profit of $2,444 million in 2017 was $197 million, or 9% higher than reported operating profit of $2,247 million in 2016. 2017 included transaction costs of $52 million. 2016 included charges of $96 million related to cost reduction actions. Refer to Note 5 of the consolidated financial statements for a further discussion of these items. Excluding the impact of these items, adjusted operating profit of $2,496 million in 2017 was $153 million, or 7% higher than adjusted operating profit of $2,343 million in 2016 driven by higher volumes and price. A discussion of operating profit by segment is included in the segment discussion that follows.

Reported interest expense – net in 2017 decreased $29 million, or 15%, versus 2016. 2016 included charges of $16 million relating to the early redemption of notes (see Note 13 to the consolidated financial statements). Excluding this

charge, adjusted interest expense decreased $13 million, or 7%, largely attributable to overall lower net debt. See Note 9 to the consolidated financial statements for further information relating to interest expense.

The reported effective tax rate for 2017 was 44.9% versus 26.9% in 2016. The ETR for the 2017 period included a net $394 million tax charge related to the Tax Act and a $5 million tax benefit related to transaction costs and a pension settlement (see Note 5 and Note 7 to the consolidated financial statements). The ETR for the 2016 period includes a $35 million tax benefit related to a pension settlement, bond redemption and cost reduction program and other charges (see Note 13 and Note 18 to the consolidated financial statements). Excluding these impacts, on an adjusted basis the ETR for the 2017 and 2016 periods was relatively flat at 27.2% and 27.1%, respectively.

Linde's equity investments are primarily located in the United States, China, Italy, and the Middle East. Equity income increased $6 million in 2017.

At December 31, 2017, reported noncontrolling interests consisted primarily of noncontrolling shareholders' investments in Asia (primarily in China), Europe (primarily in Italy), and surface technologies. Reported noncontrolling interests increased $23 million to $61 million in 2017 from $38 million in 2016. Reported noncontrolling interests for the year ended December 31, 2016 included a reduction of $5 million related to a cost reduction program. The remaining increase was driven by PG Technologies, LLC ("PGT"), a surface technologies joint venture with GE Aviation formed in the fourth quarter of 2016 (see Note 16 to the consolidated financial statements).

Reported income from continuing operations in 2017 was $1,247 million, or $253 million lower than $1,500 million in 2016. Adjusted income from continuing operations of $1,690 million in 2017 was $114 million, or 7% higher than $1,576 million in 2016. Adjusted income from continuing operations increased primarily due to higher adjusted operating profit and lower adjusted interest expense - net.

Reported diluted earnings per share from continuing operations of $4.32 in 2017 decreased $0.89 per diluted share, or 17% from $5.21 in 2016. The decrease included a $1.36 net income tax charge related to the Tax Act and a $0.17 charge related to transaction costs and other charges (see Note 7 and Note 5 to the consolidated financial statements). Adjusted diluted EPS from continuing operations of $5.85 in 2017 increased $0.37 per diluted share, or 7%, from adjusted diluted EPS from continuing operations of $5.48 in 2016. The increase in adjusted diluted EPS was primarily due to higher adjusted income from continuing operations.

Other comprehensive income for the year ended December 31, 2017 of $536 million includes favorable currency translation adjustments of $525 million and an $11 million favorable impact in the funded status of retirement obligations. The favorable translation adjustments reflect the impact of translating local currency foreign subsidiary financial statements into U.S. dollars, and are largely driven by the weakening of the U.S. dollar against the Canadian dollar, Euro, and Korean won. Favorable currency translation adjustments included $232 million in Asia, $153 million in North America and $106 million in Europe partially offset by unfavorable currency translation adjustments of $35 million in South America. The increase in the funded status of retirement obligations was primarily the result of lower current year actuarial losses, as the impact of lower U.S. discount rates was largely offset by a higher actual return on assets. Refer to the Currency section of the MD&A and Notes 9 and 18 to the consolidated financial statements.

The number of employees at December 31, 2017 was 26,461, a decrease of 37 employees from December 31, 2016. This decrease primarily reflects the impact of cost reduction programs implemented during the previous year.

Other Financial Data

EBITDA increased $265 million to $3,675 million in 2017 from $3,410 million in 2016. Adjusted EBITDA increased $221 million to $3,727 million in 2017 from $3,506 million in 2016 driven by higher adjusted income from continuing operations plus depreciation and amortization versus the prior year.

See the "Non-GAAP Financial Measures" section for definitions and reconciliation of these non-GAAP measures to reported amounts.

Related Party Transactions

The company’s related parties are primarily unconsolidated equity affiliates. The company did not engage in any material transactions involving related parties that included terms or other aspects that differ from those which would be negotiated with independent parties.

Environmental Matters

Linde’s principal operations relate to the production and distribution of atmospheric and other industrial gases, which historically have not had a significant impact on the environment. However, worldwide costs relating to environmental protection may continue to grow due to increasingly stringent laws and regulations, and Linde's ongoing commitment to rigorous internal standards. In addition, Linde may face physical risks from climate change and extreme weather.

Climate Change

Linde operates in jurisdictions that have, or are developing, laws and/or regulations to reduce or mitigate the perceived adverse effects of greenhouse gas ("GHG") emissions and faces a highly uncertain regulatory environment in this area. For example, the U.S. Environmental Protection Agency ("EPA") has promulgated rules requiring reporting of GHG emissions, and Linde and many of its suppliers and customers are subject to these rules. EPA has also promulgated regulations to restrict GHG emissions, including final rules regulating GHG emissions from light-duty vehicles and certain large manufacturing facilities, many of which are Linde suppliers or customers. In addition to these developments in the United States, GHGs are regulated in the European Union under the Emissions Trading System, which has wide implications for the company's customers and may impact certain operations of Linde in Europe. There are also requirements for mandatory reporting in Canada, which apply to certain Linde operations and will be used in developing cap-and-trade regulations on GHG emissions. These regulations are expected to impact certain Linde facilities in Canada. Climate change and energy efficiency laws and policies are also being widely introduced in jurisdictions throughout South America, Mexico and parts of Asia. China has announced plans to launch a national carbon emissions trading system, though it does not appear the regulations will have a direct impact on GHG emissions from Linde facilities. Among other impacts, such regulations are expected to raise the costs of energy, which is a significant cost for Linde. Nevertheless, Linde's long-term customer contracts routinely provide rights to recover increased electricity, natural gas, and other costs that are incurred by the company as a result of Climate Change regulation.

Linde anticipates continued growth in its hydrogen business, as hydrogen is essential to refineries that use it to remove sulfur from transportation fuels in order to meet ambient air quality standards in the United States and fuel standards in other regions. Hydrogen production plants and a large number of other manufacturing and electricity-generating plants have been identified in California and the European Union as a source of carbon dioxide emissions and these plants are subject to cap-and-trade regulations in those jurisdictions. Linde believes it will be able to mitigate the costs of these regulations through the terms of its product supply contracts. However, legislation that limits GHG emissions may impact growth by increasing capital, compliance, operating and maintenance costs and/or decreasing demand.

To manage business risks from current and potential GHG emission regulation as well as physical consequences of climate change, Linde actively monitors current developments, evaluates the direct and indirect business risks, and takes appropriate actions. Among others, actions include: increasing relevant resources and training; maintaining contingency plans; obtaining advice and counsel from expert vendors, insurance providers and industry experts; incorporating GHG provisions in commercial agreements; and conducting regular reviews of the business risks with management. Although there are considerable uncertainties, Linde believes that the business risk from potential regulations can be effectively managed through its commercial contracts. Additionally, Linde does not anticipate any material effects regarding its plant operations or business arising from potential physical risks of climate change.

Linde continuously seeks opportunities to optimize its own energy use and GHG footprint through rigorous energy efficiency, investment in renewable energy, and purchasing hydrogen as a chemical byproduct where feasible. Linde maintains related performance improvement targets and reports progress against these targets regularly to business management and annually to Linde's Board of Directors.

At the same time, Linde may benefit from business opportunities arising from governmental regulation of GHG and other emissions; uncertain costs of energy and certain natural resources; the development of renewable energy alternatives; and new technologies that help extract natural gas, improve air quality, increase energy efficiency and mitigate the impacts of climate change. Linde continues to develop new applications that can lower emissions, including GHG emissions, in

Linde's processes and help customers lower energy consumption and increase product throughput. Stricter regulation of water quality in emerging economies such as China provide a growing market for a number of gases, e.g., oxygen for wastewater treatment. Increased concern about drought in areas such as California may create a market for carbon dioxide for desalination. Renewable fuel standards in the European Union and U.S. create a market for second-generation biofuels which use industrial gases such as oxygen, carbon dioxide, and hydrogen.

Costs Relating to the Protection of the Environment

Environmental protection costs in 2018 were not significant. Linde anticipates that future annual environmental protection expenditures will be similar to 2018, subject to any significant changes in existing laws and regulations. Based on historical results and current estimates, management does not believe that environmental expenditures will have a material adverse effect on the consolidated financial position, the consolidated results of operations or cash flows in any given year.

Legal Proceedings

See Note 19 to the consolidated financial statements for information concerning legal proceedings.

Retirement Benefits

Pensions

The net periodic benefit cost for the U.S. and International pension plans was $24 million in 2018, $58 million in 2017 and $51 million in 2016. The net periodic pension cost for 2018 includes a benefit of $44 million related to gains on settlements triggered as part of the Praxair European business divestiture and recognized on the Net gain on sale of businesses line. This also includes settlement charges related to lump sum payments (e.g., triggered by change in control or normal retirements) of $14 million in 2018. Settlement charges for 2017 and 2016 were $2 million and $4 million, respectively.

The funded status (pension benefit obligation ("PBO") less the fair value of plan assets) for the U.S. plans was a deficit of $556 million as of December 31, 2018 versus a deficit of $560 million at December 31, 2017. Actuarial gains on favorable liability experience that arose during the current year related primarily to higher discount rates and were largely offset by a lower return on assets. The funded status (pension benefit obligation ("PBO") less the fair value of plan assets) for international plans was a deficit of $1,241 million as of December 31, 2018 versus a deficit of $158 million at December 31, 2017. The deficit is primarily due to the Linde AG merger. Linde' AG's major international pension arrangements are in the United Kingdom and Germany.

Global pension contributions were $87 million in 2018, $19 million in 2017 and $11 million in 2016. At a minimum, Linde contributes to its pension plans to comply with local regulatory requirements (e.g., ERISA in the United States). Discretionary contributions in excess of the local minimum requirements are made based on many factors, including long-term projections of the plans' funded status, the economic environment, potential risk of overfunding, pension insurance costs and alternative uses of cash. Changes to these factors can impact the timing of discretionary contributions from year to year. Estimated required contributions for 2019 are currently expected to be in the range of $95 million to $160 million.

Linde assumes expected returns on plan assets for 2019 of 7.50% and 5.00% for the U.S. and international plans, respectively, which are consistent with the long-term expected return on its investment portfolio.

Excluding the impact of any settlements, 2019 consolidated pension expense is expected to be $6 million.

Postretirement Benefits Other Than Pensions ("OPEB")

The net periodic benefit cost for OPEB plans was a $4 million cost in 2018, a $13 million benefit in 2017 and a $5 million cost in 2016. 2017 includes a curtailment gain on a South American OPEB plan of $18 million.

In 2019, consolidated net periodic benefit costs for the OPEB plans is expected to be approximately $5 million.

Refer to the Critical Accounting Policies section and Note 18 to the consolidated financial statements for a more detailed discussion of the company’s retirement benefits, including a description of the various retirement plans and the assumptions used in the calculation of net periodic benefit cost and funded status.

Insurance

Linde purchases insurance to limit a variety of property and casualty risks, including those related to property, business interruption, third-party liability and workers’ compensation. Currently, the company self-retains up to $5 million per occurrence for workers’ compensation, general and vehicle liability in the United States and retains up to $5 million per occurrence at its various properties worldwide. To mitigate its aggregate loss potential above these retentions, the company purchases insurance coverage from highly rated insurance companies. The company does not currently operate or participate in any captive insurance companies or other non-traditional risk transfer alternatives.

At December 31, 2018 and 2017, the company had recorded a total of $60 million and $35 million, respectively, representing an estimate of the retained liability for the ultimate cost of claims incurred and unpaid as of the balance sheet dates. The estimated liability is established using statistical analysis and is based upon historical experience, actuarial assumptions and professional judgment. These estimates are subject to the effects of trends in loss severity and frequency and are subject to a significant degree of inherent variability. If actual claims differ from the company’s estimates, they will be adjusted at that time and financial results could be impacted.

Linde recognizes estimated insurance proceeds relating to damages at the time of loss only to the extent of incurred losses. Any insurance recoveries for business interruption and for property damages in excess of the net book value of the property are recognized only when realized or pending payments confirmed by its insurance companies.

SEGMENT DISCUSSION

Through October 31, 2018 the company's operations were organized into five reportable segments, four of which have been determined on a geographic basis of segmentation: North America, Europe, South America and Asia. The company's surface technologies business represents the fifth reportable segment. These segments are comprised of Praxair businesses for all years presented. As discussed above in the section *"Business Overview - Merger of Praxair, Inc. and Linde AG"* Linde AG became a separate sixth reportable segment effective with the merger on October 31, 2018 and, accordingly, Linde AG's operations were included in the consolidated financial statements effective from the merger date (see Notes 1 and 3 to the consolidated financial statements for additional information).

The following summary of sales and operating profit by segment provides a basis for the discussion that follows (for additional information concerning Linde's segments, see Note 20 to the consolidated financial statements). Linde evaluates the performance of its reportable segments based on operating profit, excluding the items not indicative of ongoing business trends.

(Dollar amounts in millions)				Variance	
Year Ended December 31,	**2018**	**2017**	**2016**	**2018 vs. 2017**	**2017 vs. 2016**
Sales					
North America	$ 6,420	$ 6,023	$ 5,592	7 %	8 %
Europe	1,592	1,558	1,392	2 %	12 %
South America	1,369	1,501	1,399	(9)%	7 %
Asia	1,964	1,738	1,555	13 %	12 %
Surface Technologies	682	617	596	11 %	4 %
Linde AG	2,873	—	—		
	$ 14,900	$ 11,437	$ 10,534	30 %	9 %
Operating Profit					
North America	$ 1,648	$ 1,517	$ 1,431	9 %	6 %
Europe	316	301	274	5 %	10 %
South America	215	239	263	(10)%	(9)%
Asia	427	333	276	28 %	21 %
Surface Technologies	118	106	99	11 %	7 %
Linde AG	252	—	—		
Segment operating profit	2,976	2,496	2,343	19 %	7 %
Transaction costs and other charges	(309)	(52)	(96)		
Net gain on sale of businesses	3,294	—	—		
Purchase accounting impacts - Linde AG	(714)	—	—		
Consolidated operating profit	$ 5,247	$ 2,444	$ 2,247		

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North America

(Dollar amounts in millions) Year Ended December 31,	2018	2017	2016	Variance 2018 vs. 2017	Variance 2017 vs. 2016
Sales	$ 6,420	$ 6,023	$ 5,592	7%	8%
Cost of sales, exclusive of depreciation and amortization	3,395	3,167	2,871		
Gross margin	3,025	2,856	2,721		
Operating expenses	717	708	676		
Depreciation and amortization	660	631	614		
Operating profit	$ 1,648	$ 1,517	$ 1,431	9%	6%
Operating margin	25.7%	25.2%	25.6%		

	2018 vs. 2017 % Change		2017 vs. 2016 % Change	
Factors Contributing to Changes	Sales	Operating Profit	Sales	Operating Profit
Volume	4%	6%	4%	8%
Price/Mix	2% —	8%	2%	5%
Cost pass-through	1%	—%	2%	—%
Currency	—%	—%	—%	—%
Acquisitions/Divestitures	—%	—%	—%	—%
Other	—%	(5%)	—%	(7%)
	7%	9%	8%	6%

The following tables provide sales by end-market and distribution method:

	% of Sales 2018	% of Sales 2017	% of Sales 2016	% Change* 2018 vs. 2017	% Change* 2017 vs. 2016
Sales by End-Markets					
Manufacturing	29%	29%	29%	8%	4%
Metals	11%	12%	12%	5%	7%
Energy	17%	18%	17%	(1%)	7%
Chemicals	11%	9%	9%	25%	5%
Electronics	5%	5%	5%	3%	17%
Healthcare	7%	7%	7%	7%	5%
Food & Beverage	10%	10%	10%	8%	5%
Aerospace	2%	2%	2%	21%	14%
Other	8%	8%	9%	(2%)	1%
	100%	100%	100%		

* Excludes impact of currency, natural gas/precious metals cost pass-through and acquisitions/divestitures.

	% of Sales		
	2018	2017	2016
Sales by Distribution Method			
On-Site	30 %	30 %	28 %
Merchant	37 %	37 %	38 %
Packaged Gas	31 %	31 %	31 %
Other	2 %	2 %	3 %
	100 %	100 %	100 %

The North America segment includes Linde's industrial gases operations in the United States, Canada and Mexico.

Sales for 2018 increased $397 million, or 7%, versus 2017. Higher cost pass-through, primarily higher natural gas prices passed through to hydrogen customers, increased sales by 1% with minimal impact on operating profit. Excluding cost pass–through, sales increased 6% primarily due to higher volumes to most end-markets and higher pricing.

Operating profit in 2018 increased $131 million, or 9% from 2017 driven by higher volumes and pricing. Operating profit for 2018 also included a $30 million asset impairment charge which was more than offset by $43 million of gains on asset disposals.

Sales for 2017 increased $431 million, or 8%, versus 2016. Higher cost pass-through, primarily higher natural gas prices passed through to hydrogen customers, increased sales by 2% with minimal impact on operating profit. Excluding cost pass–through, sales increased 6% primarily due to higher volumes to all end-markets and higher pricing.

Operating profit in 2017 increased $86 million, or 6% from 2016 driven by higher volumes and pricing which were partially offset by hurricane impacts and higher costs, primarily energy and purchased products.

Europe

(Dollar amounts in millions) **Year Ended December 31,**	2018	2017	2016	Variance 2018 vs. 2017	Variance 2017 vs. 2016
Sales	$ 1,592	$ 1,558	$ 1,392	2 %	12 %
Cost of sales, exclusive of depreciation and amortization	940	889	774		
Gross margin	652	669	618		
Operating expenses	190	199	189		
Depreciation and amortization	146	169	155		
Operating profit	$ 316	$ 301	$ 274	5 %	10 %
Operating margin	19.8 %	19.3 %	19.7 %		

	2018 vs. 2017		2017 vs. 2016	
	% Change		% Change	
	Sales	Operating Profit	Sales	Operating Profit
Factors Contributing to Changes				
Volume	1 %	1 %	5%	8 %
Price/Mix	2 %	9 %	1%	3 %
Cost pass-through	2 %	— %	1%	— %
Currency	4 %	5 %	2%	2 %
Acquisitions/Divestitures	(7%)	(7%)	3%	2 %
Other	— %	(3%)	—%	(5%)
	2 %	5 %	12%	10 %

The following tables provide sales by end-market and distribution method:

	% of Sales			% Change*	
	2018	2017	2016	2018 vs. 2017	2017 vs. 2016
Sales by End-Markets					
Manufacturing	20%	20%	21%	5 %	4%
Metals	17%	16%	16%	8 %	9%
Energy	4%	5%	5%	(4%)	1%
Chemicals	12%	12%	14%	6 %	7%
Electronics	7%	7%	7%	2 %	7%
Healthcare	12%	12%	11%	6 %	4%
Food & Beverage	15%	14%	12%	11 %	8%
Aerospace	1%	1%	1%	(12%)	3%
Other	12%	13%	13%	(1%)	8%
	100%	100%	100%		

* Excludes impact of currency, natural gas/precious metals cost pass-through and acquisitions/divestitures.

	% of Sales		
	2018	2017	2016
Sales by Distribution Method			
On-Site	18%	18%	19%
Merchant	34%	35%	35%
Packaged Gas	43%	42%	42%
Other	5%	5%	4%
	100%	100%	100%

Linde's European industrial gases business operated in Spain, Ireland, Italy, France, Germany, Russia, the United Kingdom, Scandinavia and the Benelux region. In connection with the merger, Praxair was required to sell the majority of its European industrial gases business. The sale was completed on December 3, 2018 and the European business results are included in the consolidated financial statements through the date of sale. See Note 4 to the consolidated financial statements.

Sales in 2018 increased $34 million, or 2% from 2017. The divestiture of the European businesses decreased sales by 7%. Excluding the divestiture impact, sales increased 9% from 2017. Higher cost pass-through increased sales by 2% with minimal impact on operating profit. Favorable currency translation increased sales by 4%. Higher volumes and higher price increased sales by 1% and 2%, respectively.

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Operating profit in 2018 of $316 million increased $15 million, or 5% from 2017. The divestiture of the European businesses decreased operating profit by 7%. Currency translation impact increased operating profit by 5%. Excluding the divestiture and currency impacts, operating profit increased 7% driven by higher price and higher volumes, partially offset by cost inflation.

Sales in 2017 increased $166 million, or 12% from 2016. Higher cost pass-through increased sales by 1% with minimal impact on operating profit. Favorable currency translation increased sales by 2%. Higher overall volumes, including new project start-ups, and higher price increased sales by 5% and 1%, respectively. The acquisition of a carbon dioxide business in the prior year largely serving the food and beverage end-market increased sales by 3%.

Operating profit in 2017 of $301 million increased $27 million, or 10% from 2016 driven by higher volumes and higher price. Favorable currency translation and the acquisition of the carbon dioxide business in the prior year each contributed 2% to operating profit growth.

South America

(Dollar amounts in millions) Year Ended December 31,	2018	2017	2016	Variance 2018 vs. 2017	Variance 2017 vs. 2016
Sales	$ 1,369	$ 1,501	$ 1,399	(9)%	7 %
Cost of sales, exclusive of depreciation and amortization	819	905	822		
Gross margin	550	596	577		
Operating expenses	187	198	181		
Depreciation and amortization	148	159	133		
Operating profit	$ 215	$ 239	$ 263	(10)%	(9)%
Operating margin	15.7%	15.9%	18.8%		

Factors Contributing to Changes	2018 vs. 2017 % Change Sales	2018 vs. 2017 % Change Operating Profit	2017 vs. 2016 % Change Sales	2017 vs. 2016 % Change Operating Profit
Volume	1 %	(5)%	—%	(2)%
Price/Mix	2 %	12 %	1%	3 %
Cost pass-through	— %	— %	—%	— %
Currency	(12)%	(18)%	6%	4 %
Acquisitions/Divestitures	— %	— %	—%	— %
Other	— %	1 %	—%	(14)%
	(9)%	(10)%	7%	(9)%

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The following tables provide sales by end-market and distribution method:

	% of Sales			% Change*	
	2018	2017	2016	2018 vs. 2017	2017 vs. 2016
Sales by End-Markets					
Manufacturing	15%	17%	18%	(5%)	(2%)
Metals	32%	31%	31%	4 %	1 %
Energy	2%	2%	2%	1 %	23 %
Chemicals	10%	10%	9%	7 %	8 %
Electronics	—%	—%	—%	— %	— %
Healthcare	19%	19%	19%	2 %	3 %
Food & Beverage	14%	13%	13%	3 %	2 %
Aerospace	—%	—%	—%	— %	— %
Other	8%	8%	8%	11 %	(7%)
	100%	100%	100%		

* Excludes impact of currency, natural gas/precious metals cost pass-through and acquisitions/divestitures.

	% of Sales		
	2018	2017	2016
Sales by Distribution Method			
On-Site	33%	33%	31%
Merchant	38%	38%	40%
Packaged Gas	27%	27%	27%
Other	2%	2%	2%
	100%	100%	100%

The South America segment includes Linde's industrial gases operations in Brazil, Argentina, Bolivia, Chile, Colombia, Paraguay, Peru, and Uruguay.

Sales in 2018 decreased $132 million, or 9%, versus 2017. Unfavorable currency impacts decreased sales by 12% driven by the weakening of the Brazilian real and Argentine peso against the U.S. dollar. Excluding currency, sales increased 3% driven by higher price and volumes.

Operating profit decreased $24 million or 10% versus 2017. Excluding unfavorable currency impacts, operating profit increased 8% driven by higher price and lower costs partially offset by unfavorable sales mix.

Effective July 1, 2018 Argentina was deemed a highly inflationary economy (see Note 5 to the consolidated financial statements).

Sales in 2017 increased $102 million, or 7%, versus 2016. Favorable currency translation impacts increased sales by 6% primarily due to the strengthening of the Brazilian Real against the U.S. dollar. Excluding currency, sales increased 1% driven by higher price. Volumes were flat as new project contribution was offset by negative underlying base volumes in Brazil due to weak industrial production. Growth in on-site volumes due to new plant start-ups accounted for the increase in on-site sales as a percentage of total segment sales.

Operating profit decreased $24 million or 9% versus 2016. Excluding currency translation, operating profit decreased 13% driven by unfavorable product sales mix and cost inflation which were partially offset by higher price.

Asia

(Dollar amounts in millions) Year Ended December 31,	2018	2017	2016	Variance 2018 vs. 2017	Variance 2017 vs. 2016
Sales	$ 1,964	$ 1,738	$ 1,555	13%	12%
Cost of sales, exclusive of depreciation and amortization	1,215	1,098	998		
Gross margin	749	640	557		
Operating expenses	118	122	102		
Depreciation and amortization	204	185	179		
Operating profit	$ 427	$ 333	$ 276	28%	21%
Operating margin	21.7%	19.2%	17.7%		

	2018 vs. 2017		2017 vs. 2016	
	% Change		% Change	
	Sales	Operating Profit	Sales	Operating Profit
Factors Contributing to Changes				
Volume	9%	14 %	11 %	19 %
Price/Mix	2%	14 %	1 %	8 %
Cost pass-through	1%	— %	1 %	— %
Currency	1%	1 %	1 %	1 %
Acquisitions / Divestitures	—%	— %	(2%)	— %
Other	—%	(1%)	— %	(7%)
	13%	28 %	12 %	21 %

The following tables provide sales by end-market and distribution method:

	% of Sales			% Change*	
	2018	2017	2016	2018 vs. 2017	2017 vs. 2016
Sales by End-Markets					
Manufacturing	9%	9%	9%	16 %	13 %
Metals	26%	27%	28%	12 %	15 %
Energy	5%	3%	3%	104 %	14 %
Chemicals	14%	15%	14%	3 %	20 %
Electronics	34%	33%	33%	13 %	12 %
Healthcare	1%	1%	1%	10 %	(1%)
Food & Beverage	2%	2%	2%	(6%)	(1%)
Aerospace	—%	—%	—%	— %	— %
Other	9%	10%	10%	(6%)	10 %
	100%	100%	100%		

* Excludes impact of currency, natural gas/precious metals cost pass-through and acquisitions/divestitures.

	% of Sales		
	2018	2017	2016
Sales by Distribution Method			
On-Site	50 %	50 %	50 %
Merchant	32 %	30 %	29 %
Packaged Gas	11 %	13 %	14 %
Other	7 %	7 %	7 %
	100 %	100 %	100 %

The Asia segment includes Linde's industrial gases operations in China, India, Korea and Thailand, with smaller operations in Taiwan and the Middle East.

Sales in 2018 increased $226 million, or 13% versus 2017. Cost pass-through, primarily energy, and currency impacts each increased sales by 1%. Volume growth of 9% was primarily attributable to base volume growth in China, Korea and India and new project start-ups in China. Higher price increased sales by 2% driven by China. Sales growth was the strongest in the metals, energy and electronics end-markets.

Operating profit for 2018 increased $94 million, or 28%, as compared to the prior year driven by higher volumes and price. Operating profit for 2018 included a $22 million asset impairment charge, offset by a litigation settlement gain.

Sales in 2017 increased $183 million, or 12% versus 2016. Favorable currency translation and cost pass-through each increased sales by 1%. Divestitures decreased sales by 2% due to the sale of an ownership interest in a majority-owned joint venture in India in 2016. Excluding these impacts, sales increased 12% driven by base volume growth in China, Korea and India, new project start-ups in China and Korea and higher price.

Operating profit for 2017 increased $57 million, or 21%, as compared to the prior year driven by higher volumes and price, partially offset by cost inflation.

Surface Technologies

(Dollar amounts in millions) Year Ended December 31,	2018	2017	2016	Variance 2018 vs. 2017	Variance 2017 vs. 2016
Sales	$ 682	$ 617	$ 596	11 %	4 %
Cost of sales, exclusive of depreciation and amortization	448	402	391		
Gross margin	234	215	205		
Operating expenses	72	69	66		
Depreciation and amortization	44	40	40		
Operating profit	$ 118	$ 106	$ 99	11 %	7 %
Operating margin	17.3 %	17.2 %	16.6 %		

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	2018 vs. 2017		2017 vs. 2016	
	% Change		% Change	
	Sales	Operating Profit	Sales	Operating Profit
Factors Contributing to Changes				
Volume/Price	8%	19 %	2%	4%
Cost pass-through	1%	— %	—%	—%
Currency	2%	2 %	—%	—%
Acquisitions/Divestitures	—%	— %	2%	1%
Other	—%	(10%)	—%	2%
	11%	11 %	4%	7%

The following table provides sales by end-market:

	% of Sales			% Change*	
	2018	2017	2016	2018 vs. 2017	2017 vs. 2016
Sales by End-Markets					
Manufacturing	12%	11%	11%	22 %	2 %
Metals	8%	9%	9%	(4%)	— %
Energy	18%	19%	23%	4 %	(12%)
Chemicals	2%	2%	2%	(4%)	(7%)
Electronics	1%	1%	1%	33 %	32 %
Healthcare	—%	—%	—%	— %	— %
Food & Beverage	3%	3%	4%	(3%)	(4%)
Aerospace	45%	44%	40%	12 %	11 %
Other	11%	11%	10%	5 %	2 %
	100%	100%	100%		

* Excludes impact of currency, natural gas/precious metals cost pass-through and acquisitions/divestitures.

Surface Technologies provides high-performance coatings and thermal-spray powders and equipment in the Americas, Europe, and Asia.

Sales increased $65 million, or 11% versus 2017 primarily due to higher volumes to the aerospace and manufacturing end-markets and higher price. Currency translation increased sales by 2%.

Operating profit increased $12 million, or 11% versus 2017. Currency translation increased operating profit by 2%. Excluding currency impacts, operating profit increased 9% driven by increased volumes and price partially offset by project ramp up costs.

Sales increased $21 million, or 4% versus 2016 primarily due to higher volumes to the aerospace end-market and acquisitions driven by a majority-owned joint venture with GE aviation.

Operating profit increased $7 million, or 7% versus 2016 due to higher volumes and acquisitions.

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Linde AG

(Dollar amounts in millions) Year Ended December 31,	2018
Sales	$ 2,873
Cost of sales, exclusive of depreciation and amortization	1,899
Gross margin	974
Operating expenses	440
Depreciation and amortization	282
Operating profit	$ 252
Operating margin	8.8 %

The following tables provide sales by end-market and distribution method:

	% of Sales
	2018
Sales by End-Markets	
Manufacturing	19 %
Metals	9 %
Chemicals & Energy	13 %
Electronics	7 %
Healthcare	23 %
Food & Beverage	6 %
Engineering	18 %
Other	5 %
	100 %

* Excludes impact of currency, natural gas/precious metals cost pass-through and acquisitions/divestitures.

	% of Sales
	2018
Sales by Distribution Method	
On-Site	17 %
Merchant	18 %
Packaged Gas	44 %
Other	21 %
	100 %

Linde AG became a sixth reportable segment effective with the merger on October 31, 2018. Sales of $2,873 million and operating profit of $252 million represent results for the two month period from merger date through December 31, 2018.

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Currency

The results of Linde's non-U.S. operations are translated to the company's reporting currency, the U.S. dollar, from the functional currencies used in the countries in which the company operates. For most foreign operations, Linde uses the local currency as its functional currency. There is inherent variability and unpredictability in the relationship of these functional currencies to the U.S. dollar and such currency movements may materially impact Linde's results of operations in any given period.

To help understand the reported results, the following is a summary of the significant currencies underlying Linde's consolidated results and the exchange rates used to translate the financial statements (rates of exchange expressed in units of local currency per U.S. dollar):

Currency	Percent of 2018 Consolidated Sales	Statements of Income Average Year Ended December 31, 2018	2017	2016	Balance Sheets December 31, 2018	2017
Euro	16 %	0.85	0.89	0.90	0.87	0.83
Brazilian real	7 %	3.63	3.19	3.47	3.87	3.31
Chinese yuan	7 %	6.60	6.76	6.64	6.88	6.51
Canadian dollar	6 %	1.30	1.30	1.32	1.36	1.26
Mexican peso	4 %	19.20	18.86	18.65	19.65	19.66
Korean won	3 %	1,100	1,131	1,160	1,111	1,067
British pound	3 %	0.75	0.78	0.74	0.78	0.74
Indian rupee	3 %	68	65	67	70	64
Australia dollars	1 %	1.34	—	—	1.42	—
Taiwan dollars	1 %	30.13	30.43	32.25	30.55	29.73
Norwegian krone	<1%	8.13	8.26	8.39	8.64	8.20
Argentina peso (a)	<1%	26.19	16.51	14.74	37.70	18.65

(a) Effective July 1, 2018 Argentina was deemed a highly inflationary economy (see Note 5 to the consolidated financial statements).

LIQUIDITY, CAPITAL RESOURCES AND OTHER FINANCIAL DATA

(Millions of dollars) **Year Ended December 31,**	**2018**	**2017**	**2016**
Net Cash Provided by (Used for)			
Operating Activities			
Income from continuing operations (including noncontrolling interests)	$ 4,288	$ 1,308	$ 1,538
Non-cash charges (credits):			
Add: Transaction costs and other charges, net of payments (a)	40	26	83
Add: Amortization of merger-related inventory step-up	368	—	—
Less: Net gain on sale of businesses (b)	(2,923)	—	—
Add: Tax Act income tax charge, net	(61)	394	—
Add: Depreciation and amortization	1,830	1,184	1,122
Add (Less): Deferred income taxes, excluding Tax Act	(187)	136	(13)
Add (Less): non-cash charges and other	237	102	(4)
Income from continuing operations adjusted for non-cash charges and other	3,592	3,150	2,726
Less: Pension contributions	(87)	(19)	(11)
Add (Less): Working capital	202	(158)	52
Add (Less): Other	(53)	68	22
Net cash provided by operating activities	$ 3,654	$ 3,041	$ 2,789
Investing Activities			
Capital expenditures	$ (1,883)	$ (1,311)	$ (1,465)
Acquisitions, net of cash acquired	(25)	(33)	(363)
Divestitures and asset sales, net of cash divested	5,908	30	58
Cash acquired in merger transaction	1,363	—	—
Net cash provided by (used for) investing activities	$ 5,363	$ (1,314)	$ (1,770)
Financing Activities			
Debt increases (decreases) – net	$ (2,908)	$ (771)	$ 357
Issuances (purchases) of ordinary shares – net	(522)	108	(89)
Cash dividends – Linde plc shareholders	(1,166)	(901)	(856)
Noncontrolling interest transactions and other	(402)	(92)	(71)
Net cash (used) for financing	$ (4,998)	$ (1,656)	$ (659)
Effect of exchange rate changes on cash	$ (60)	$ 22	$ 17
Cash and cash equivalents, end-of-period	$ 4,466	$ 617	$ 524

(a) See Note 5 to the consolidated financial statements.

(b) See Note 4 to the consolidated financial statements.

Cash increased $3,849 million in 2018 versus 2017. The primary sources of cash in 2018 were cash flows from operations of $3,654 million, proceeds from divestitures and asset sales of $5,908 million and cash acquired in the merger of $1,363 million. The primary uses of cash included capital expenditures of $1,883 million, cash dividends to shareholders of $1,166 million, net debt repayments of $2,908 million and net purchases of ordinary shares of $522 million.

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Cash Flows From Operations

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2018 compared with 2017

Cash flows from operations was $3,654 million, or 25% of sales, an increase of $613 million from $3,041 million, or 27% of sales in 2017. The increase was primarily attributable to the merger, higher net income adjusted for non-cash charges and favorable working capital requirements, partially offset by unfavorable changes in other long–term assets and liabilities and higher pension contributions.

2017 compared with 2016

Cash flows from operations was $3,041 million, or 27% of sales, an increase of $252 million from $2,789 million, or 26% of sales in 2016. The increase was primarily attributable to higher net income adjusted for non-cash charges, a $103 million increase in dividends received from equity companies, primarily in China, and favorable changes in other long–term assets and liabilities which were partially offset by higher working capital requirements and pension contributions.

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Investing

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2018 compared with 2017

Net cash used provided by investing activities of $5,363 million increased $6,677 million from 2017 primarily driven by proceeds from the divestiture of Praxair's European business and cash acquired in the merger, partially offset by higher capital expenditures.

Capital expenditures in 2018 were $1,883 million, an increase of $572 million from 2017, driven primarily by the merger with Linde AG. Capital expenditures during 2018 related primarily to investments in new plant and production equipment for growth and density. Approximately 50% of the capital expenditures were in North America with the rest in Asia, Europe, South America and Linde AG.

Acquisition expenditures in 2018 were $25 million, a decrease of $8 million from 2017. Additionally, $1,363 million of cash was acquired in the merger (see Note 3 to the consolidated financial statements).

Divestitures and asset sales in 2018 totaled $5,908 million primarily driven by proceeds from merger-related divestitures including $5,562 million from the sale of Praxair's European business and $214 million related to the sale of Praxair's Italian joint venture (see Note 4 to the consolidated financial statements).

2017 compared with 2016

Net cash used for investing activities of $1,314 million decreased $456 million versus 2016 due to lower acquisitions and capital expenditures, partially offset by lower proceeds from divestiture and asset sales.

Capital expenditures in 2017 were $1,311 million, a decrease of $154 million from 2016. Capital expenditures during 2017 related primarily to investments in new plant and production equipment for growth and density. Approximately 60% of the capital expenditures were in North America with the rest in Asia, Europe and South America.

Acquisition expenditures in 2017 were $33 million, a decrease of $330 million from 2016. Acquisitions in the prior year were primarily comprised of the acquisition of a European carbon dioxide business and packaged gases businesses in North America and Europe (see Note 3 to the consolidated financial statements).

Divestitures and asset sales in 2017 totaled $30 million of proceeds from asset sales. 2016 divestitures and asset sales were $58 million which included proceeds from asset sales and the sale of an ownership interest in a majority-owned joint venture in India.

Financing

Linde’s financing strategy is to secure long-term committed funding by issuing public notes and debentures and commercial paper backed by a long-term bank credit agreement. Linde’s international operations are funded through a combination of local borrowing and inter-company funding to minimize the total cost of funds and to manage and centralize currency exchange exposures. As deemed necessary, Linde manages its exposure to interest-rate changes through the use of financial derivatives (see Note 14 to the consolidated financial statements and Item 7A. Quantitative and Qualitative Disclosures About Market Risk).

Cash used by financing activities was $4,998 million in 2018 compared to $1,656 million in 2017. The primary financing uses of cash were for net debt repayments, cash dividends and net purchases of Linde ordinary shares. Cash dividends of $1,166 million increased $265 million from 2017 driven primarily by higher shares outstanding after the merger and a 5% increase in dividends per share from $3.15 to $3.30. Net purchases of ordinary shares were $522 million in 2018 versus net issuances of ordinary shares of $108 million in 2017 driven by increased share repurchases. Noncontrolling interest transactions and other payments was $402 million in 2018 versus $92 million in 2017. Amounts paid in 2018 include $315 million for the purchase of the noncontrolling interest in Praxair's Italian joint venture in a merger-related transaction (see Note 4 to the consolidated financial statements) and $25 million in interest related to the early redemption of bonds (see Note 13 to the consolidated financial statements); while 2017 include dividends paid to NCI joint venture partners and repayment of project advances. The cash used for debt repayments-net of $2,908 million increased $2,137 million from $771 million during 2017 while cash increased $3,849 million. Net debt (debt minus cash) increased $2,447 million primarily due to debt acquired in the merger partially offset by the repayments of debt and increased cash.

The company believes that it has sufficient operating flexibility, cash reserves, and funding sources to maintain adequate amounts of liquidity to meet its business needs around the world. In March 2019, Linde's credit ratings as reported by Standard & Poor’s and Moody’s were A-1 and P-1 for short-term debt, respectively, and A and A2 for long-term debt, respectively.

Note 13 to the consolidated financial statements includes information with respect to the company’s debt repayments in 2018, current debt position, debt covenants and the available credit facilities; and Note 14 includes information relating to derivative financial instruments. Linde's credit facilities are with major financial institutions and are non-cancelable until maturity. Therefore, the company believes the risk of the financial institutions being unable to make required loans under the credit facilities, if requested, to be low. Linde’s major bank credit and long-term debt agreements contain standard covenants. The company was in compliance with these covenants at December 31, 2018 and expects to remain in compliance for the foreseeable future.

Linde’s total net debt outstanding at December 31, 2018 was $10,830 million, $2,447 million higher than $8,383 million at December 31, 2017. The December 31, 2018 net debt balance includes $14,258 million in public securities, $1,038 million representing primarily worldwide bank borrowings net of $4,466 million of cash. Linde’s global effective borrowing rate was approximately 1.96% for 2018.

In March 2018, Linde repaid $500 million of 1.20% notes that became due and in November 2018, Linde repaid $475 million of 1.25% notes that became due.

Additionally, in December 2018, Linde repaid $600 million of 4.50% notes due 2019 and €600 million of 1.50% notes due 2020 resulting in a $26 million interest charge ($20 million after-tax, or $0.06 per diluted share) (see Note 13 to the consolidated financial statements).

Also in December 2018, Linde repaid €750 million of 3.125% notes that became due.

In February 2019, Linde repaid $500 million of 1.90% notes that became due.

In June 2018, the company's $500 million 364-day revolving credit facility with a syndicate of banks expired and was not renewed.

On December 10, 2018 the company announced a $1.0 billion share repurchase program, of which $629 million had been repurchased through December 31, 2018. This program was completed in February of 2019. On January 22, 2019, the company’s board of directors approved the additional repurchase of $6.0 billion of its ordinary shares with a stated expiration date of February 1, 2021. For additional information related to the share repurchase programs, see Part II Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities.

CONTRACTUAL OBLIGATIONS

The following table sets forth Linde’s material contract obligations and other commercial commitments as of December 31, 2018:

(Millions of dollars)	Due or expiring by December 31,						
	2019	2020	2021	2022	2023	Thereafter	Total
Long-term debt obligations:							
Debt and capitalized lease maturities (Note 13)	$ 1,523	$ 1,642	$ 1,864	$ 2,336	$ 1,788	$ 4,658	$ 13,811
Contractual interest	315	283	232	169	141	621	1,761
Operating leases (Note 6)	305	236	186	145	102	326	1,300
Retirement obligations	245	29	30	31	31	180	546
Unconditional purchase obligations	842	767	721	675	583	3,267	6,855
Construction commitments	2,100	902	249	4	—	—	3,255
Total Contractual Obligations	$ 5,330	$ 3,859	$ 3,282	$ 3,360	$ 2,645	$ 9,052	$ 27,528

Contractual interest on long-term debt of $1,761 million represents interest the company is contracted to pay on outstanding long-term debt, current portion of long-term debt and capital lease obligations, calculated on a basis consistent with planned debt maturities, excluding the interest impact of interest rate swaps. At December 31, 2018, Linde had fixed-rate debt of $12,565 million and floating-rate debt of $2,731 million. The rate assumed for floating-rate debt was the rate in effect at December 31, 2018.

Retirement obligations of $546 million include estimates of pension plan contributions and expected future benefit payments for unfunded pension and OPEB plans. Pension plan contributions are forecasted for 2019 only. For purposes of the table, $125 million of estimated required contributions have been included for 2019. Expected future unfunded pension and OPEB benefit payments are forecasted only through 2028. Contribution and unfunded benefit payment estimates are based upon current valuation assumptions. Estimates of pension contributions after 2019 and unfunded benefit payments after 2028 are not included in the table because the timing of their resolution cannot be estimated. Retirement obligations are more fully described in Note 18 to the consolidated financial statements.

Unconditional purchase obligations of $6,855 million represent contractual commitments under various long and short-term take-or-pay arrangements with suppliers and are not included on Linde's balance sheet. These obligations are primarily minimum-purchase commitments for helium, electricity, natural gas and feedstock used to produce atmospheric and process gases. A significant portion of these obligations is passed on to customers through similar take-or-pay or other contractual arrangements. Purchase obligations that are not passed along to customers through such contractual arrangements are subject to market conditions, but do not represent a material risk to Linde. Approximately $2,224 million of the purchase obligations relates to power and is intended to secure the uninterrupted supply of electricity and feedstock to Linde's plants to reliably satisfy customer product supply obligations, and extend through 2030. Certain of the power contracts contain various cancellation provisions requiring supplier agreement, and many are subject to annual escalations based on local inflation factors.

Construction commitments of $3,255 million represent outstanding commitments to complete authorized construction projects as of December 31, 2018. A significant portion of Linde's capital spending is related to the construction of new production facilities to satisfy customer commitments which may take a year or more to complete.

Liabilities for uncertain tax positions totaling $367 million, including interest and penalties, and tax liabilities for deemed repatriation of earnings of $291 million are not included in the table because the timing of their resolution cannot be estimated. See Note 7 to the consolidated financial statements for disclosures surrounding uncertain income tax positions.

OFF-BALANCE SHEET ARRANGEMENTS

As discussed in Note 19 to the consolidated financial statements, at December 31, 2018, Linde had undrawn outstanding letters of credit, bank guarantees and surety bonds entered into in connection with normal business operations and they are not reasonably likely to have a material impact on Linde's consolidated financial condition, results of operations, or liquidity.

CRITICAL ACCOUNTING POLICIES

The policies discussed below are considered by management to be critical to understanding Linde’s financial statements and accompanying notes prepared in accordance with accounting principles generally accepted in the United States ("U.S. GAAP"). Their application places significant importance on management’s judgment as a result of the need to make estimates of matters that are inherently uncertain. Linde’s financial position, results of operations and cash flows could be materially affected if actual results differ from estimates made. These policies are determined by management and have been reviewed by Linde's Audit Committee.

Purchase Accounting

As discussed below, Linde AG's assets and liabilities were measured at fair value as of the date of the merger on a preliminary basis. Estimates of fair value represent management's best estimate of assumptions about future events and uncertainties. In determining the fair value, Linde utilized various forms of the income, cost and market approaches depending on the asset or liability being fair valued. The estimation of fair value includes significant judgments related to future cash flows (sales, costs, customer attrition rates, and contributory asset charges), discount rates, competitive trends, market comparables and others. Inputs were generally obtained from historical data supplemented by current and anticipated market conditions and growth rates. The estimates and assumptions used to determine the preliminary estimated fair value assigned to each class of assets and liabilities, as well as asset lives, have a material impact to the company's consolidated financial statements, and are based upon assumptions believed to be reasonable but that are inherently uncertain.

Due to the timing of the business combination, the magnitude of and multi-national nature of the net assets acquired, and the hold separate order (See Note 1 to the consolidated financial statements) which deferred integration of the two merged companies, at December 31, 2018 the valuation process to determine the fair values is not complete and further adjustments are expected in 2019. The company has estimated the preliminary fair value of net assets acquired based on information currently available and will continue to adjust those estimates as additional information becomes available. The areas where the fair value assessments are not finalized and, therefore, subject to adjustment during the measurement period relate primarily to identifiable intangible assets, property, plant and equipment, net assets held for sale, equity investments, income taxes, noncontrolling interests, contingencies and goodwill. As the company finalizes the fair value of net assets acquired and liabilities assumed, additional purchase price allocation adjustments will be recorded during the measurement period, but no later than one year from the date of the acquisition. The company will reflect measurement period adjustments in the period in which the adjustments are determined. Any adjustments to the fair value of assets and liabilities acquired will be offset to goodwill and any income statement impacts will be recorded at that time.

See Note 3 to the consolidated financial statements for additional information.

Depreciation and Amortization

Depreciable Lives of Property, Plant and Equipment

Linde's net property, plant and equipment at December 31, 2018 was $29,717 million, representing 32% of the company's consolidated total assets and including $19,491 million of Linde AG assets acquired at fair value in the merger. Depreciation expense for the year ended December 31, 2018 was $1,615 million, or 13% of total operating costs. This includes $225 million of purchase accounting impacts. Management judgment is required in the determination of the estimated depreciable lives that are used to calculate the annual depreciation expense and accumulated depreciation.

Property, plant and equipment are recorded at cost and depreciated over the assets' estimated useful lives on a straight-line basis for financial reporting purposes. The estimated useful life represents the projected period of time that the asset will be productively employed by the company and is determined by management based on many factors, including historical experience with similar assets, technological life cycles, geographic locations and contractual supply relationships with on-site customers. Circumstances and events relating to these assets, such as on-site contract modifications, are monitored to ensure that changes in asset lives or impairments (see "Asset Impairments") are identified and prospective depreciation expense or impairment expense is adjusted accordingly. Linde's largest asset values relate to cryogenic air-separation production plants with depreciable lives of principally 15 years.

Based upon the assets as of December 31, 2018, if depreciable lives of machinery and equipment, on average, were increased or decreased by one year, annualized depreciation expense, including Linde AG for a full year on a pro forma basis, would be decreased by approximately $528 million or increased by approximately $390 million, respectively.

See Notes 3, 9 and 10 to the consolidated financial statements for additional information.

Amortization of Other Intangible Assets

Linde’s net other intangible assets at December 31, 2018 was $16,223 million, representing 17% of the company’s consolidated total assets and including $15,636 million of Linde AG other intangible assets acquired at fair value in the merger ($13,967 million with finite lives and $1,669 million with indefinite lives). Amortization expense related to finite-lived intangible assets for the year ended December 31, 2018 was $215 million, or 2% of total operating costs. This includes $121 million of purchase accounting impacts. Management judgment is required in the determination of the estimated amortizable lives that are used to calculate the annual amortization expense and accumulated amortization. See Note 12 to the consolidated financial statements.

Based upon the assets as of December 31, 2018, if amortization lives of other intangible assets, on average, were increased or decreased by one year, annualized amortization expense, including Linde AG for a full year on a pro forma basis, would be decreased by approximately $65 million or increased by approximately $49 million, respectively.

See Notes 3, 9, and 12 to the consolidated financial statements for additional information.

Revenue Recognition

Long Term Construction Contracts

The company designs and manufactures equipment for air separation and other varied gas production and processing plants manufactured specifically for end customers. Revenue from sale of equipment is generally recognized over time as Linde has an enforceable right to payment for performance completed to date and performance does not create an asset with alternative use. For contracts recognized over time, revenue is recognized primarily using a cost incurred input method. Costs incurred to date relative to total estimated costs at completion are used to measure progress toward satisfying performance obligations. Costs incurred include material, labor, and overhead costs and represent work contributing and proportionate to the transfer of control to the customer. Contract modifications are typically accounted for as part of the existing contract and are recognized as a cumulative adjustment for the inception-to-date effect of such change. We assess performance as progress towards completion is achieved on specific projects, earnings will be impacted by changes to our forecast of revenues and costs on these projects.

Pension Benefits

Pension benefits represent financial obligations that will be ultimately settled in the future with employees who meet eligibility requirements. Because of the uncertainties involved in estimating the timing and amount of future payments, significant estimates are required to calculate pension expense and liabilities related to the company's plans. The company utilizes the services of independent actuaries, whose models are used to facilitate these calculations.

Several key assumptions are used in actuarial models to calculate pension expense and liability amounts recorded in the financial statements. Management believes the three most significant variables in the models are the expected long-term rate of return on plan assets, the discount rate, and the expected rate of compensation increase. The actuarial models also use assumptions for various other factors, including employee turnover, retirement age, and mortality. Linde management believes the assumptions used in the actuarial calculations are reasonable, reflect the company's experience and expectations for the future and are within accepted practices in each of the respective geographic locations in which it operates. Actual results in any given year will often differ from actuarial assumptions because of economic and other factors. The sensitivities to each of the key assumptions presented below exclude the impact of special items that occurred during the year (e.g., settlement gains from divestitures, settlement charges resulting from change in control provisions, etc.).

The weighted-average expected long-term rates of return on pension plan assets were 7.62% for U.S. plans and 5.13% for international plans for the year ended December 31, 2018 (8.00% and 7.91%, respectively at December 31, 2017). The expected long term rate of return on the U.S. and international plan assets is estimated based on the plans' investment strategy and asset allocation, historical capital market performance and, to a lesser extent, historical plan performance. A 0.50% change in these expected long-term rates of return, with all other variables held constant, would change Linde's pension expense by approximately $38 million.

The company has consistently used a market-related value of assets rather than the fair value at the measurement date to determine annual pension expense. The market-related value recognizes investment gains or losses over a five-year period. As a result, changes in the fair value of assets from year to year are not immediately reflected in the company's annual pension expense. Instead, annual pension expense in future periods will be impacted as deferred investment gains or losses are recognized in the market-related value of assets over the five-year period. The consolidated market-related value of assets was $8,530 million, or $286 million higher than the fair value of assets of $8,244 million at December 31, 2018. These net deferred investment gains of $286 million will be recognized in the calculation of the market-related value of assets ratably over the next four years and will impact future pension expense. Future actual investment gains or losses will impact the market-related value of assets and, therefore, will impact future annual pension expense in a similar manner.

Discount rates are used to calculate the present value of plan liabilities and pension costs and are determined annually by management. For fiscal year 2016, Praxair changed the approach that it used to determine the service and interest cost components of pension and OPEB expense for significant plans to the spot rate approach. Linde AG also adopted the spot rate approach for its material U.S. and international pension plans as of the merger date. Under this approach U.S. plans that do not use the spot rate approach continue to determine discount rates by using a cash flow matching model provided by the company's independent actuaries. The model includes a portfolio of corporate bonds graded Aa or better by at least half of the ratings agencies and matches the U.S. plans' projected cash flows to the calculated spot rates. Discount rates for the remaining international plans are based on market yields for high-quality fixed income investments representing the approximate duration of the pension liabilities on the measurement date. Refer to Note 18 to the consolidated financial statements for a summary of the discount rates used to calculate plan liabilities and benefit costs, and to the Retirement Benefits section of the Consolidated Results and Other Information section of this MD&A for a further discussion of 2018 benefit costs. A 0.50% change in discount rates, with all other variables held constant, would decrease/increase Linde's pension expense by approximately $24 million. A 0.50% reduction in discount rates would increase the PBO by approximately $806 million whereas a 0.50% increase in discount rates would have a favorable impact to the PBO of approximately $710 million.

The weighted-average expected rate of compensation increase was 3.25% for U.S. plans and 2.38% for international plans at December 31, 2018 (3.25% and 3.35%, respectively, at December 31, 2017). The estimated annual compensation increase is determined by management every year and is based on historical trends and market indices. A 0.50% change in the expected rate of compensation increase, with all other variables held constant, would change Linde's pension expense by approximately $8 million and would impact the PBO by approximately $60 million.

Asset Impairments

Goodwill and Other Indefinite-Lived Intangibles Assets

At December 31, 2018, the company had goodwill of $26,874 million, of which $24,320 million was recorded in connection with the Linde AG merger, and $1,669 million of other indefinite-lived intangible assets acquired in the merger. Goodwill represents the aggregate of the excess consideration paid for acquired businesses over the fair value of the net assets acquired. Indefinite-lived other intangibles relate to the Linde name.

The company performs a goodwill impairment test annually in the second quarter or more frequently if events or circumstances indicate that an impairment loss may have been incurred, and no impairments were indicated. The company has continuously re-evaluated the likelihood of goodwill impairments in its reporting units subsequent to the second quarter test, and does not believe there is indication of impairment for any of its reporting units. At December 31, 2018, Linde's enterprise value was approximately $96 billion (outstanding shares multiplied by the year-end stock price plus debt, and without any control premium) while its total capital was approximately $68 billion.

The impairment test allows an entity to first assess qualitative factors to determine if it is more likely than not that the fair value of a reporting unit is less than carrying value. If it is determined that it is more likely than not that the fair value of a reporting unit is less than carrying value then the company will estimate and compare the fair value of its reporting units to their carrying value, including goodwill. Reporting units are determined based on one level below the operating segment level. Fair value is determined through the use of projected future cash flows, multiples of earnings and sales and other factors.

Such analysis requires the use of certain market assumptions and discount factors, which are subjective in nature. As applicable, estimated values can be affected by many factors beyond the company's control such as business and economic trends, government regulation, and technological changes. Management believes that the qualitative factors used to perform its annual goodwill impairment assessment are appropriate and reasonable. Although the 2018 qualitative assessment indicated that it is more likely than not that the fair value of each reporting unit substantially exceeded its carrying value, changes in circumstances or conditions affecting this analysis could have a significant impact on the fair value determination, which could then result in a material impairment charge to the company's results of operations.

Other indefinite-lived intangible assets are evaluated for impairment on an annual basis or more frequently if events and circumstances indicate that an impairment loss may have been incurred, and no impairments were indicated.

See Notes 3, 11 and 12 to the consolidated financial statements.

Long-Lived Assets

Long-lived assets, including Property, plant and equipment and finite-lived other intangible assets, are tested for impairment whenever events or changes in circumstances indicate that the carrying amount of an individual asset or asset group may not be recoverable. For purposes of this test, asset groups are determined based upon the lowest level for which there are independent and identifiable cash flows. Based upon Linde's business model, for property, plant and equipment an asset group may be a single plant and related assets used to support on-site, merchant and packaged gas customers. Alternatively, the asset group may be a pipeline complex which includes multiple interdependent plants and related assets connected by pipelines within a geographic area used to support the same distribution methods.

Income Taxes

At December 31, 2018, Linde had deferred tax assets of $2,039 million (net of valuation allowances of $237 million), and deferred tax liabilities of $8,961 million. At December 31, 2018, uncertain tax positions totaled $319 million (see Notes 2 and 7 to the consolidated financial statements). Income tax expense was $817 million for the year ended December 31, 2018, or about 16.2% of pre-tax income (see Note 7 to the consolidated financial statements for additional information related to taxes).

In the preparation of consolidated financial statements, Linde estimates income taxes based on diverse legislative and regulatory structures that exist in various jurisdictions where the company conducts business. Deferred income tax assets and liabilities represent tax benefits or obligations that arise from temporary differences due to differing treatment of certain items for accounting and income tax purposes. Linde evaluates deferred tax assets each period to ensure that estimated future taxable income will be sufficient in character (e.g. capital gain versus ordinary income treatment), amount and timing to result in their recovery. A valuation allowance is established when management determines that it is more likely than not that a deferred tax asset will not be realized to reduce the assets to their realizable value. Considerable judgments are required in establishing deferred tax valuation allowances and in assessing exposures related to tax matters. As events and circumstances change, related reserves and valuation allowances are adjusted to income at that time. Linde's tax returns are subject to audit and local taxing authorities could challenge the company's tax positions. The company's practice is to review tax filing positions by jurisdiction and to record provisions for uncertain income tax positions, including interest and penalties when applicable. Linde believes it records and/or discloses such potential tax liabilities as appropriate and has reasonably estimated its income tax liabilities and recoverable tax assets. If new information becomes available, adjustments are charged or credited against income at that time. Management does not anticipate that such adjustments would have a material adverse effect on the company's consolidated financial position or liquidity; however, it is possible that the final outcomes could have a material impact on the company's reported results of operations.

In 2018, Linde completed its accounting and updated its provisional estimate related to the deemed repatriation of foreign earnings under the 2017 Tax Act in accordance with Staff Accounting Bulletin Number 118 resulting in a net reduction to income tax expense of $61 million (see Note 7 to the consolidated financial statements). A provision is made for taxes on undistributed earnings of foreign subsidiaries and related companies to the extent that such earnings are not deemed to be permanently reinvested.

Contingencies

The company accrues liabilities for non-income tax contingencies when management believes that a loss is probable and the amounts can be reasonably estimated, while contingent gains are recognized only when realized. If new information becomes available or losses are sustained in excess of recorded amounts, adjustments are charged against income at that time. Management does not anticipate that in the aggregate such losses would have a material adverse effect on the company's consolidated financial position or liquidity; however, it is possible that the final outcomes could have a material impact on the company's reported results of operations.

Linde is subject to various claims, legal proceedings and government investigations that arise from time to time in the ordinary course of business. These actions are based upon alleged environmental, tax, antitrust and personal injury claims, among others (see Note 19 to the consolidated financial statements). Such contingencies are significant and the accounting requires considerable management judgments in analyzing each matter to assess the likely outcome and the need for establishing appropriate liabilities and providing adequate disclosures. Linde believes it records and/or discloses such contingencies as appropriate and has reasonably estimated its liabilities.

NEW ACCOUNTING STANDARDS

See Note 2 to the consolidated financial statements for information concerning new accounting standards and the impact of the implementation of these standards on the company's financial statements.

FAIR VALUE MEASUREMENTS

Linde does not expect changes in the aggregate fair value of its financial assets and liabilities to have a material impact on the consolidated financial statements. See Note 15 to the consolidated financial statements.

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NON-GAAP FINANCIAL MEASURES

The following non-GAAP measures are intended to supplement investors' understanding of the company's financial information by providing measures which investors, financial analysts and management use to help evaluate the company's financial leverage and operating performance. Special items which the company does not believe to be indicative of on-going business performance are excluded from these calculations so that investors can better evaluate and analyze historical and future business trends on a consistent basis. Definitions of these non-GAAP measures may not be comparable to similar definitions used by other companies and are not a substitute for similar GAAP measures.

The non-GAAP measures in the following reconciliations are presented in the Selected Financial Data (Item 6) or this MD&A.

Adjusted Amounts

Certain amounts for 2018, 2017, 2016, 2015 and 2014 have been included for reference purposes and to facilitate the calculations contained herein.

(Dollar amounts in millions, except per share data) **Year Ended December 31,**	**2018**	**2017**	**2016**	**2015**	**2014**
Adjusted Operating Profit and Margin					
Reported operating profit	$ 5,247	$ 2,444	$ 2,247	$ 2,370	$ 2,644
Less: Net gain on sale of businesses	(3,294)			—	—
Add: Transaction costs and other charges	309	52	—	—	—
Add: Purchase accounting impacts - Linde AG	714	—	—	—	—
Add: Venezuela currency devaluation	—	—	—	—	131
Add: Cost reduction program	—	—	96	165	—
Total adjustments	(2,271)	52	96	165	131
Adjusted operating profit	$ 2,976	$ 2,496	$ 2,343	$ 2,535	$ 2,775
Reported percent change	115 %	9 %	(5 %)	(10 %)	(2 %)
Adjusted percent change	19 %	7 %	(8 %)	(9 %)	2 %
Reported sales	$ 14,900	$ 11,437	$ 10,534	$ 10,776	$ 12,273
Reported operating margin	35.2 %	21.4 %	21.3 %	22.0 %	21.5 %
Adjusted operating margin	20.0 %	21.8 %	22.2 %	23.5 %	22.6 %
Adjusted Net pension and OPEB cost (benefit), excluding service cost					
Reported net pension and OPEB cost (benefit), excluding service cost	$ (4)	$ (4)	$ 9	49	36
Less: Pension settlement charge	(14)	(2)	(4)	(7)	(7)
Adjusted net pension and OPEB cost (benefit), excluding service cost	$ (18)	$ (6)	$ 5	$ 42	$ 29
Adjusted Interest Expense - Net					
Reported interest expense	202	161	190	161	213

Less: Bond redemption	(26)	—	(16)	—	(36)
Add: Purchase accounting impacts - Linde AG	21	—	—	—	—
Adjusted interest expense - net	$ 197	$ 161	$ 174	$ 161	$ 177

(Dollar amounts in millions, except per share data) Year Ended December 31,	2018	2017	2016	2015	2014
Adjusted Income Taxes and Effective Tax Rate					
Reported income taxes	$ 817	$ 1,026	$ 551	$ 612	$ 691
Add: Bond redemption	6	—	6	—	14
Add: Pension settlement charge	3	1	1	2	2
Add: Cost reduction program	—	—	28	39	—
Less: Tax Act	61	(394)	—	—	—
Add: Transaction costs and other charges	3	4	—	—	—
Less: Net gain on sale of businesses	(371)	—	—	—	—
Add: Other tax charge	(44)	—	—	—	—
Add: Purchase accounting impacts - Linde AG	191	—	—	—	—
Total adjustments	(151)	(389)	35	41	16
Adjusted income taxes	$ 666	$ 637	$ 586	$ 653	$ 707
Reported income before income taxes and equity investments	$ 5,049	$ 2,287	$ 2,048	$ 2,160	$ 2,395
Add: Bond redemption	26	—	16	—	36
Add: Pension settlement charge	14	2	4	7	7
Add: Venezuela currency devaluation	—	—	—	—	131
Add: Cost reduction program	—	—	96	165	—
Add: Transaction costs and other charges	309	52	—	—	—
Less: Net gain on sale of businesses	(3,294)	—	—	—	—
Add: Purchase accounting impacts - Linde AG	693	—	—	—	—
Total adjustments	(2,252)	54	116	172	174
Adjusted income before income taxes and equity investments	$ 2,797	$ 2,341	$ 2,164	$ 2,332	$ 2,569
Reported effective tax rate	16.2 %	44.9 %	26.9 %	28.3 %	28.9 %
Adjusted effective tax rate	23.8 %	27.2 %	27.1 %	28.0 %	27.5 %
Adjusted Noncontrolling Interests from Continuing Operations					
Reported noncontrolling interests from continuing operations	$ (15)	$ (61)	$ (38)	$ (44)	$ (52)
Add: Purchase accounting impacts - Linde AG	(59)	—	—	—	—
Less: Cost reduction program	1	—	(5)	(1)	—
Total adjustments	(58)	—	(5)	(1)	—
Adjusted noncontrolling interests from continuing operations	$ (73)	$ (61)	$ (43)	$ (45)	$ (52)
Adjusted Income from Continuing Operations					
Reported income from continuing operations	$ 4,273	$ 1,247	$ 1,500	$ 1,547	$ 1,694
Add: Bond redemption	20	—	10	—	22
Add: Pension settlement charge	11	1	3	5	5
Add: Venezuela currency devaluation	—	—	—	—	131
Add: Cost reduction program	1	—	63	125	—
Less: Net gain on sale of businesses	(2,923)	—	—	—	—

Add: Other tax charges	44	—	—	—	—
Add: Tax Act	(61)	394	—	—	—
Add: Transaction costs and other charges	305	48	—	—	—
Add: Purchase accounting impacts - Linde AG	451	—	—	—	—
Total adjustments	(2,152)	443	76	130	158
Adjusted income from continuing operations	$ 2,121	$ 1,690	$ 1,576	$ 1,677	$ 1,852
Reported percent change	243 %	(17)%	(3)%	(9)%	(3)%
Adjusted percent change	26 %	7 %	(6)%	(9)%	5 %

(Dollar amounts in millions, except per share data) Year Ended December 31,	2018	2017	2016	2015	2014
Adjusted Diluted Earnings Per Share from Continuing Operations					
Reported diluted earnings per share from continuing operations	$ 12.79	$ 4.32	$ 5.21	$ 5.35	$ 5.73
Add: Bond redemption	0.06	—	0.04	—	0.07
Add: Pension settlement charge	0.03	—	0.01	0.02	0.02
Add: Venezuela currency devaluation	—	—	—	—	0.45
Add: Cost reduction program	—	—	0.22	0.43	—
Add: Tax Act	(0.18)	1.36	—	—	—
Add: Transaction costs and other charges	0.92	0.17	—	—	—
Add: Net gain on sale of businesses	(8.75)	—	—	—	—
Less: Other tax charges	0.13	—	—	—	—
Less: Purchase accounting impacts - Linde AG	1.35	—	—	—	—
Total adjustments	(6.44)	1.53	0.27	0.45	0.54
Adjusted diluted earnings per share from continuing operations	$ 6.35	$ 5.85	$ 5.48	$ 5.80	$ 6.27
Reported percent change	196%	(17%)	(3%)	(7%)	(2%)
Adjusted percent change	9%	7%	(6%)	(7%)	6%

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EBITDA, Adjusted EBITDA, EBITDA Margin, and Adjusted EBITDA Margin

These measures are used by investors, financial analysts and management to assess a company's profitability.

(Dollar amounts in millions)

Year Ended December 31,	2018	2017	2016	2015	2014
Reported income from continuing operations	$ 4,273	$ 1,247	$ 1,500	$ 1,547	$ 1,694
Add: noncontrolling interest from continuing operations	15	61	38	44	52
Add: interest expense - net	202	161	190	161	213
Add: net pension and OPEB cost (benefit), excluding service cost	(4)	(4)	9	49	36
Add: income taxes	817	1,026	551	612	691
Add: depreciation and amortization	1,830	1,184	1,122	1,106	1,170
EBITDA	$ 7,133	$ 3,675	$ 3,410	$ 3,519	$ 3,856
Adjustments:					
Add: Cost reduction program and other charges, net	$ —	$ —	$ 96	$ 165	$ —
Add: Venezuela currency devaluation	—	—	—	—	131
Add: Transaction costs and other charges	309	52	—	—	—
Add: Net gain on sale of businesses	(3,294)	—	—	—	—
Add: Purchase accounting impacts - Linde AG	368	—	—	—	—
Adjusted EBITDA	$ 4,516	$ 3,727	$ 3,506	$ 3,684	$ 3,987
Reported Sales	$ 14,900	$ 11,437	$ 10,534	$ 10,776	$ 12,273
EBITDA Margin	47.9%	32.1%	32.4%	32.7%	31.4%
Adjusted EBITDA Margin	30.3%	32.6%	33.3%	34.2%	32.5%

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Linde is exposed to market risks relating to fluctuations in interest rates and currency exchange rates. The objective of financial risk management at Linde is to minimize the negative impact of interest rate and foreign exchange rate fluctuations on the company's earnings, cash flows and equity.

To manage these risks, Linde uses various derivative financial instruments, including interest-rate swaps, treasury rate locks, currency swaps, forward contracts, and commodity contracts. Linde only uses commonly traded and non-leveraged instruments. These contracts are entered into primarily with major banking institutions thereby minimizing the risk of credit loss. Also, see Notes 2 and 14 to the consolidated financial statements for a more complete description of Linde's accounting policies and use of such instruments.

The following discussion presents the sensitivity of the market value, earnings and cash flows of Linde's financial instruments to hypothetical changes in interest and exchange rates assuming these changes occurred at December 31, 2018. The range of changes chosen for these discussions reflects Linde's view of changes which are reasonably possible over a one-year period. Market values represent the present values of projected future cash flows based on interest rate and exchange rate assumptions.

Interest Rate Risk

At December 31, 2018, Linde had debt totaling $15,296 million ($9,000 million at December 31, 2017). For fixed-rate instruments, interest rate changes affect the fair market value but do not impact earnings or cash flows. Conversely, for floating-rate instruments, interest rate changes generally do not affect the fair market value of the instrument but impact future earnings and cash flows, assuming that other factors are held constant. At December 31, 2018, including the impact of derivatives Linde had fixed-rate debt of $12,565 million and floating-rate debt of $2,731 million, representing 82% and 18%, respectively, of total debt. At December 31, 2017, Linde had fixed-rate debt of $8,253 million and floating-rate debt of $747 million, representing 92% and 8%, respectively, of total debt.

Fixed Rate Debt

In order to mitigate interest rate risk, when considered appropriate interest-rate swaps are entered into as hedges of underlying financial instruments to effectively change the characteristics of the interest rate without actually changing the underlying financial instrument. At December 31, 2018, Linde had fixed-to-floating interest rate swaps outstanding that were designated as hedging instruments of the underlying debt issuances - refer to Note 14 to the consolidated financial statements for additional information. This sensitivity analysis assumes that, holding all other variables constant (such as foreign exchange rates, swaps and debt levels), a one-percentage-point increase in interest rates would decrease the unrealized fair market value of the fixed-rate debt portfolio by approximately $594 million ($450 million in 2017). A 100 basis point increase in interest rates would result in an approximate $92 million increase to derivative assets recorded.

Variable Rate Debt

At December 31, 2018, the after-tax earnings and cash flows impact of a one-percentage point increase in interest rates, including the offsetting impact of derivatives, on the variable-rate debt portfolio would be approximately $24 million. At December 31, 2017 the impact of a one-percentage point increase was $6 million, holding all other variables constant.

Foreign Currency Risk

Linde's exchange-rate exposures result primarily from its investments and ongoing operations in South America (primarily Brazil, Argentina, Chile and Colombia), Europe (primarily Germany, Scandinavia, and the United Kingdom), Canada, Mexico, Asia Pacific (primarily Australia, China, India, and Korea) and other business transactions such as the procurement of equipment from foreign sources. Linde frequently utilizes currency contracts to hedge these exposures. At December 31, 2018, Linde had a notional amount outstanding of $9,412 million ($2,693 million at December 31, 2017) related to foreign exchange contracts. The majority of these were to hedge recorded balance sheet exposures, primarily intercompany loans denominated in non-functional currencies. See Note 14 to the consolidated financial statements.

Holding all other variables constant, if there were a 10% adverse change in foreign-currency exchange rates for the portfolio, the fair market value of foreign-currency contracts outstanding at December 31, 2018 and 2017 would decrease by approximately $307 million and $174 million, respectively, which would be largely offset by an offsetting gain on the foreign-currency fluctuation of the underlying exposure being hedged.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

MANAGEMENT'S STATEMENT OF RESPONSIBILITY FOR FINANCIAL STATEMENTS

Linde's consolidated financial statements are prepared by management, which is responsible for their fairness, integrity and objectivity. The accompanying financial statements have been prepared in conformity with accounting principles generally accepted in the United States of America applied on a consistent basis, except for accounting changes as disclosed, and include amounts that are estimates and judgments. All historical financial information in this annual report is consistent with the accompanying financial statements.

Linde maintains accounting systems, including internal accounting controls, monitored by a staff of internal auditors, that are designed to provide reasonable assurance of the reliability of financial records and the protection of assets. The concept of reasonable assurance is based on recognition that the cost of a system should not exceed the related benefits. The effectiveness of those systems depends primarily upon the careful selection of financial and other managers, clear delegation of authority and assignment of accountability, inculcation of high business ethics and conflict-of-interest standards, policies and procedures for coordinating the management of corporate resources, and the leadership and commitment of top management. In compliance with Section 404 of the Sarbanes-Oxley Act of 2002, Linde assessed its internal control over financial reporting and issued a report (see below).

PricewaterhouseCoopers LLP, an independent registered public accounting firm, has completed an audit of Linde's 2018, 2017 and 2016 consolidated financial statements and of its internal control over financial reporting as of December 31, 2018 in accordance with the standards of the Public Company Accounting Oversight Board (United States) as stated in their report.

The Audit Committee of the Board of Directors, which consists solely of non-employee directors, is responsible for overseeing the functioning of the accounting system and related controls and the preparation of annual financial statements. The Audit Committee periodically meets with management, internal auditors and the independent accountants to review and evaluate their accounting, auditing and financial reporting activities and responsibilities, including management's assessment of internal control over financial reporting. The independent registered public accounting firm and internal auditors have full and free access to the Audit Committee and meet with the committee, with and without management present.

MANAGEMENT'S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING

Linde's management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Exchange Act Rule 13a-15(f). Under the supervision and with the participation of management, including the company's principal executive officer and principal financial officer, the company conducted an evaluation of the effectiveness of its internal control over financial reporting based on the framework in *Internal Control – Integrated F*ramework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (often referred to as COSO). Based on this evaluation, management concluded that the company's internal control over financial reporting was effective as of December 31, 2018.

Linde's evaluation of internal control over financial reporting as of December 31, 2018 did not include the internal control over financial reporting related to Linde AG because the business was acquired in a merger accounted for as a business combination consummated during 2018. Total assets and sales for Linde AG represent approximately 26.4% and 19.3%, respectively, of the related consolidated financial statement amounts as of and for the year ended December 31, 2018.

PricewaterhouseCoopers LLP, an independent registered public accounting firm, has audited and issued their opinion on the effectiveness of the company's internal control over financial reporting as of December 31, 2018 as stated in their report.

/s/ STEPHEN F. ANGEL	/s/ KELCEY E. HOYT
Stephen F. Angel **Chief Executive Officer**	**Kelcey E. Hoyt** **Chief Accounting Officer**
/s/ MATTHEW J. WHITE	
Matthew J. White **Chief Financial Officer**	March 18, 2019

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Shareholders of Linde plc

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Linde plc and its subsidiaries (the "Company") as of December 31, 2018 and 2017, and the related consolidated statements of income, comprehensive income, equity and cash flows for each of the three years in the period ended December 31, 2018, including the related notes (collectively referred to as the "consolidated financial statements"). We also have audited the Company's internal control over financial reporting as of December 31, 2018, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2018 and 2017, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2018 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2018, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the COSO.

Basis for Opinions

The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Report on Internal Control Over Financial Reporting. Our responsibility is to express opinions on the Company's consolidated financial statements and on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

As described in Management's Report on Internal Control Over Financial Reporting, management has excluded Linde Aktiengesellschaft ("Linde AG") from its assessment of internal control over financial reporting as of December 31, 2018 because the business was acquired in a merger accounted for as a business combination consummated during 2018. We have also excluded Linde AG from our audit of internal control over financial reporting. Linde AG is a subsidiary whose total assets and total sales excluded from management's assessment and our audit of internal control over financial reporting represent 26.4% and 19.3%, respectively, of the related consolidated financial statement amounts as of and for the year ended December 31, 2018.

Definition and Limitations of Internal Control over Financial Reporting

A company’s internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company’s internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company’s assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ PricewaterhouseCoopers LLP
Stamford, Connecticut
March 18, 2019

We have served as the Company’s or its predecessor auditor since 1992.

CONSOLIDATED STATEMENTS OF INCOME
LINDE PLC AND SUBSIDIARIES
(Dollar amounts in millions, except per share data)

Year Ended December 31,	2018	2017	2016
Sales	$ 14,900	$ 11,437	$ 10,534
Cost of sales, exclusive of depreciation and amortization	9,084	6,461	5,855
Selling, general and administrative	1,629	1,207	1,145
Depreciation and amortization	1,830	1,184	1,122
Research and development	113	93	92
Transaction costs and other charges	309	52	96
Net gain on sale of businesses	3,294	—	—
Other income (expenses) – net	18	4	23
Operating Profit	5,247	2,444	2,247
Interest expense – net	202	161	190
Net pension and OPEB cost (benefit), excluding service cost	(4)	(4)	9
Income From Continuing Operations Before Income Taxes and Equity Investments	5,049	2,287	2,048
Income taxes on continuing operations	817	1,026	551
Income From Continuing Operations Before Equity Investments	4,232	1,261	1,497
Income from equity investments	56	47	41
Income From Continuing Operations (Including Noncontrolling Interests)	4,288	1,308	1,538
Income from discontinued operations, net of tax	117	—	—
Net Income (Including Noncontrolling Interests)	4,405	1,308	1,538
Less: noncontrolling interests from continuing operations	(15)	(61)	(38)
Less: noncontrolling interests from discontinued operations	(9)	—	—
Net Income – Linde plc	$ 4,381	$ 1,247	$ 1,500
Net Income – Linde plc			
Income from continuing operations	$ 4,273	$ 1,247	$ 1,500
Income from discontinued operations	$ 108	$ —	$ —
Per Share Data – Linde plc Shareholders			
Basic earnings per share from continuing operations	$ 12.93	$ 4.36	$ 5.25
Basic earnings per share from discontinued operations	0.33	—	—
Basic earnings per share	$ 13.26	$ 4.36	$ 5.25
Diluted earnings per share from continuing operations	$ 12.79	$ 4.32	$ 5.21
Diluted earnings per share from discontinued operations	0.32	—	—
Diluted earnings per share	$ 13.11	$ 4.32	$ 5.21
Weighted Average Shares Outstanding (000's):			
Basic shares outstanding	330,401	286,261	285,677
Diluted shares outstanding	334,127	289,114	287,757

The accompanying Notes are an integral part of these financial statements.

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME
LINDE PLC AND SUBSIDIARIES
(Dollar amounts in millions)

Year Ended December 31,	2018	2017	2016
NET INCOME (INCLUDING NONCONTROLLING INTERESTS)	$ 4,405	$ 1,308	$ 1,538
OTHER COMPREHENSIVE INCOME (LOSS)			
Translation adjustments:			
Foreign currency translation adjustments	(401)	433	116
Reclassifications to net income (Note 4)	318	—	—
Income taxes	7	92	(48)
Translation adjustments	(76)	525	68
Funded status - retirement obligations (Note 18):			
Retirement program remeasurements	(260)	(39)	(163)
Reclassifications to net income	94	55	60
Income taxes	(55)	(5)	27
Funded status - retirement obligations	(221)	11	(76)
Derivative instruments (Note 14):			
Current year unrealized gain (loss)	—	—	1
Reclassifications to net income	(1)	—	(1)
Income taxes	—	—	—
Derivative instruments	(1)	—	—
Securities (Note 9):			
Current year unrealized gain (loss)	(1)	—	—
Reclassifications to net income	—	—	—
Income taxes	—	—	—
Securities	(1)	—	—
TOTAL OTHER COMPREHENSIVE INCOME (LOSS)	(299)	536	(8)
COMPREHENSIVE INCOME (INCLUDING NONCONTROLLING INTERESTS)	4,106	1,844	1,530
Less: noncontrolling interests	(83)	(95)	(34)
COMPREHENSIVE INCOME - LINDE PLC	$ 4,023	$ 1,749	$ 1,496

The accompanying Notes are an integral part of these financial statements.

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CONSOLIDATED BALANCE SHEETS
LINDE PLC AND SUBSIDIARIES
(Dollar amounts in millions)

December 31,	2018	2017
Assets		
Cash and cash equivalents	$ 4,466	$ 617
Accounts receivable – net	4,297	1,710
Contract assets	283	—
Inventories	1,651	614
Assets held for sale	5,498	—
Prepaid and other current assets	1,077	344
Total Current Assets	17,272	3,285
Property, plant and equipment – net	29,717	11,825
Equity investments	1,838	727
Goodwill	26,874	3,233
Other intangible assets – net	16,223	785
Other long-term assets	1,462	581
Total Assets	$ 93,386	$ 20,436
Liabilities and Equity		
Accounts payable	$ 3,219	$ 922
Short-term debt	1,485	238
Current portion of long-term debt	1,523	979
Contract liabilities	1,546	—
Accrued taxes	657	242
Liabilities of assets held for sale	768	—
Other current liabilities	3,758	926
Total Current Liabilities	12,956	3,307
Long-term debt	12,288	7,783
Other long-term liabilities	3,435	1,588
Deferred credits	7,611	1,236
Total Liabilities	36,290	13,914
Commitments and contingencies (Note 19)		
Redeemable noncontrolling interests	16	11
Linde plc Shareholders' Equity:		
Ordinary shares (2018: €0.001 par value, authorized 1,750,000,000 shares, issued 551,310,272 ordinary shares; 2017: and Common stock $0.01 par value, authorized 800,000,000 shares, issued 383,230,625 shares)	1	4
Additional paid-in capital	40,151	4,084
Retained earnings	16,529	13,224
Accumulated other comprehensive income (loss)	(4,456)	(4,098)
Less: Treasury stock, at cost (2018 – 4,068,642 shares and 2017 – 96,453,634 shares)	(629)	(7,196)
Total Linde plc Shareholders' Equity	51,596	6,018
Noncontrolling interests	5,484	493
Total Equity	57,080	6,511
Total Liabilities and Equity	$ 93,386	$ 20,436

The accompanying Notes are an integral part of these financial statements.

CONSOLIDATED STATEMENTS OF CASH FLOWS
LINDE PLC AND SUBSIDIARIES
(Millions of dollars)

Year Ended December 31,	2018	2017	2016
Increase (Decrease) in Cash and Cash Equivalents			
Operations			
Net income – Linde plc	$ 4,381	$ 1,247	$ 1,500
Less: income from discontinued operations, net of tax and noncontrolling interests	(108)	—	—
Add: Noncontrolling interests from continuing operations	15	61	38
Income from continuing operations (including noncontrolling interests)	$ 4,288	$ 1,308	$ 1,538
Adjustments to reconcile net income to net cash provided by operating activities:			
Transaction costs and other charges, net of payments	40	26	83
Amortization of merger-related inventory step-up	368	—	—
Tax Act income tax charge, net	(61)	394	—
Depreciation and amortization	1,830	1,184	1,122
Deferred income taxes, excluding Tax Act	(187)	136	(13)
Share-based compensation	62	59	39
Net gain on sale of businesses, net of tax	(2,923)	—	—
Non-cash charges and other	175	43	(43)
Working capital			
Accounts receivable	(124)	(92)	(33)
Inventory	(4)	(22)	(13)
Prepaid and other current assets	43	(66)	6
Payables and accruals	287	22	92
Pension contributions	(87)	(19)	(11)
Long-term assets, liabilities and other	(53)	68	22
Net cash provided by operating activities	3,654	3,041	2,789
Investing			
Capital expenditures	(1,883)	(1,311)	(1,465)
Acquisitions, net of cash acquired	(25)	(33)	(363)
Divestitures and asset sales, net of cash divested	5,908	30	58
Cash acquired in merger transaction	1,363	—	—
Net cash provided by (used for) investing activities	5,363	(1,314)	(1,770)
Financing			
Short-term debt borrowings (repayments) – net	208	(199)	191
Long-term debt borrowings	8	11	936
Long-term debt repayments	(3,124)	(583)	(770)
Issuances of ordinary shares	77	120	139
Purchases of ordinary shares	(599)	(12)	(228)
Cash dividends – Linde plc shareholders	(1,166)	(901)	(856)
Noncontrolling interest transactions and other	(402)	(92)	(71)
Net cash used for financing activities	(4,998)	(1,656)	(659)
Discontinued Operations			
Cash provided by operating activities	$ 48	$ —	$ —
Cash used for investing activities	(23)	—	—
Cash provided by financing activities	2	—	—
Net cash provided by discontinued operations	27	—	—
Effect of exchange rate changes on cash and cash equivalents	(60)	22	17

Change in cash and cash equivalents	3,986	93	377
Cash and cash equivalents, beginning-of-period	617	524	147
Cash and cash equivalents, including discontinued operations	$ 4,603	$ 617	$ 524
Cash and cash equivalents of discontinued operations	(137)	—	—

Cash and cash equivalents, end-of-period	$ 4,466	$ 617	$ 524
Supplemental Data			
Income taxes paid	$ 757	$ 565	$ 585
Interest paid, net of capitalized interest (Note 9)	$ 214	$ 184	$ 189

The accompanying Notes are an integral part of these financial statements.

CONSOLIDATED STATEMENTS OF EQUITY
LINDE PLC AND SUBSIDIARIES
(Dollar amounts in millions, except per share data, shares in thousands)

	Linde plc Shareholders' Equity									
	Ordinary shares					Treasury Stock				
Activity	**Shares**	**Amounts**	**Additional Paid-in Capital**	**Retained Earnings**	**Accumulated Other Comprehensive Income (Loss) (Note 9)**	**Shares**	**Amounts**	**Linde plc Shareholders' Equity**	**Noncontrolling Interests**	**Total Equity**
Balance, December 31, 2015	383,231	$ 4	$ 4,005	$ 12,229	$ (4,596)	98,352	$(7,253)	$ 4,389	$ 404	$ 4,793
Net Income				1,500				1,500	35	1,535
Other comprehensive income (loss)					(4)			(4)	(11)	(15)
Noncontrolling interests:										
Dividends and other capital reductions								—	(28)	(28)
Additions (Reductions)			50					50	20	70
Redemption value adjustments (Note 16)				6				6		6
Dividends ($3.00 per common share)				(856)				(856)		(856)
Issuances of common stock:										
For the dividend reinvestment and stock purchase plan						(60)	7	7		7
For employee savings and incentive plans			(20)			(2,044)	143	123		123
Other							5	5		5
Purchases of common stock						2,082	(238)	(238)		(238)
Share-based compensation			39					39		39
Balance, December 31, 2016	383,231	$ 4	$ 4,074	$ 12,879	$ (4,600)	98,330	$(7,336)	$ 5,021	$ 420	$ 5,441
Net Income				1,247				1,247	59	1,306
Other comprehensive income (loss)					502			502	34	536
Noncontrolling interests:										
Dividends and other capital reductions								—	(35)	(35)
Additions (Reductions)			—					—	15	15
Redemption value adjustments (Note 16)				(1)				(1)		(1)
Dividends ($3.15 per common share)				(901)				(901)		(901)

Activity	Linde plc Shareholders' Equity: Ordinary shares: Shares	Ordinary shares: Amounts	Additional Paid-in Capital	Retained Earnings	Accumulated Other Comprehensive Income (Loss) (Note 9)	Treasury Stock: Shares	Treasury Stock: Amounts	Linde plc Shareholders' Equity	Noncontrolling Interests	Total Equity
Issuances of common stock:										
For the dividend reinvestment and stock purchase plan						(50)	7	7		7
For employee savings and incentive plans			(49)			(1,835)	134	85		85
Purchases of common stock						9	(1)	(1)		(1)
Share-based compensation			59					59		59
Balance, December 31, 2017	383,231	$ 4	$ 4,084	$ 13,224	$ (4,098)	96,454	$(7,196)	$ 6,018	$ 493	$ 6,511
Net Income available for Linde plc shareholders				4,381				4,381	21	4,402
Other comprehensive loss					(265)			(265)	59	(206)
Noncontrolling interests:										
Dividends and other capital reductions								—	(49)	(49)
Additions (Reductions) - (Note 16)			(127)					(127)	(186)	(313)
Redemption value adjustments (Note 16)				(3)				(3)		(3)
Dividends ($3.30 per common share)				(1,166)				(1,166)		(1,166)
Issuances of ordinary shares:										
For the dividend reinvestment and stock purchase plan						(31)	5	5		5
For employee savings and incentive plans	255	—	(46)			(1,109)	79	33		33
Purchases of ordinary shares						4,079	(630)	(630)		(630)
Share-based compensation			62					62		62
Tax Act Reclassification (Note 7)				93	(93)			—		—
Impact of merger (Notes 3 and 16)	167,824	(3)	36,178			(95,324)	7,113	43,288	5,146	48,434
Balance, December 31, 2018	551,310	$ 1	$ 40,151	$ 16,529	$ (4,456)	4,069	$ (629)	$ 51,596	$ 5,484	$ 57,080

The accompanying Notes are an integral part of these financial statements

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
LINDE PLC AND SUBSIDIARIES

NOTE 1. FORMATION OF LINDE PLC AND BUSINESS COMBINATION OF PRAXAIR, INC. AND LINDE AG

Formation of Linde plc

Linde plc ("Linde" or “the company”), a public limited company incorporated in Ireland, was formed in accordance with the requirements of the business combination agreement, dated as of June 1, 2017, as amended (the “business combination agreement”). Pursuant to the business combination agreement, among other things, Praxair, Inc., a Delaware corporation (“Praxair”), and Linde Aktiengesellschaft, a stock corporation incorporated under the laws of Germany (“Linde AG”), agreed to combine their respective businesses through an all-stock transaction, and become subsidiaries of the company (collectively referred to as “business combination” or “merger”). On October 31, 2018, Linde plc completed the business combination. Prior to the business combination, the company did not conduct any business activities other than those required for its formation and matters contemplated by the business combination agreement.

Business Combination of Praxair, Inc. and Linde AG

The business combination has been accounted for using the acquisition method of accounting in accordance with the provisions of Financial Accounting Standards Board (“FASB”) Accounting Standards Codification ("ASC") 805, *“Business Combinations”*, with Praxair representing the accounting acquirer. Pursuant to Rule 12g-3(a) under the Exchange Act, as of October 31, 2018, the company became the successor issuer to Praxair. Also, the Linde plc shares are deemed to be registered under Section 12(b) of the Exchange Act, and the company is subject to the informational requirements of the Exchange Act and the rules and regulations promulgated thereunder. The Linde shares trade on the New York Stock Exchange and the Frankfurt Stock Exchange under the ticker symbol “LIN”. Prior to the business combination, the Praxair shares were registered pursuant to Section 12(b) of the Exchange Act and listed on the NYSE. In connection with the completion of the business combination, the Praxair shares were suspended from trading on the NYSE as of close of business (New York Time) on October 30, 2018. On November 1, 2018, Praxair filed a Form 25 to delist and deregister its three series of Euro-denominated notes, including its 1.50% Notes due 2020, 1.20% Notes due 2024 and 1.625% Notes due 2025, that were listed on the NYSE. Trading of the Euro-denominated notes on the NYSE was suspended as of close of business (New York Time) on November 9, 2018, and Praxair filed a Form 15 with the SEC terminating the registration under the Exchange Act of its securities and suspending Praxair’s reporting obligations under Section 15(d) of the Exchange Act.

In connection with the business combination, the company, Praxair and Linde AG entered into various agreements with regulatory authorities to satisfy anti-trust requirements to secure approval to consummate the business combination. These agreements included the sale of the majority of Praxair’s European businesses (subsequently completed on December 3, 2018), the majority of Linde AG’s America’s business (subsequently completed on March 1, 2019), as well as certain divestitures of other Praxair and Linde AG businesses in Asia that are expected to be sold in 2019 (collectively, the “merger-related divestitures”). See Note 4 for additional information relating to merger-related divestitures.

To obtain merger approval in the United States. Linde, Praxair and Linde AG entered into an agreement with the U.S. Federal Trade Commission dated October 1, 2018 (“hold separate order” or “HSO”). Under the HSO, the company, Praxair and Linde AG agreed to (i) continue to operate Linde AG and Praxair as independent, ongoing, economically viable, competitive businesses held separate, distinct, and apart from each other’s operations; (ii) not coordinate any aspect of the operations of Linde AG and Praxair, including the marketing or sale of any products; and (iii) maintain separate financial ledgers, books, and records that report on a periodic basis, consistent with past practices, the assets, liabilities, expenses, revenues, and income of each, until certain divestitures in the United States have been completed. The restrictions under the hold separate order were lifted March 1, 2019, concurrent with the sale of the required merger-related divestitures in the United States.

NOTE 2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Principles of Consolidation – The consolidated financial statements were prepared in conformity with accounting principles generally accepted in the United States of America (" U.S. GAAP") and include the accounts of all significant subsidiaries where control exists and, in limited situations, variable-interest entities where the company is the primary beneficiary. Intercompany transactions and balances are eliminated in consolidation and any significant related-party transactions have been disclosed.

Equity investments generally consist of 20% to 50% owned operations where the company exercises significant influence, but does not have control. Equity income from equity investments in corporations is reported on an after-tax basis.

Pre-tax income from equity investments that are partnerships or limited-liability corporations ("LLC") is included in other income (expenses) – net with related taxes included in Income taxes. Equity investments are reviewed for impairment whenever events or circumstances reflect that an impairment loss may have incurred. Operations less than 20% owned, where the company does not exercise significant influence, are generally carried at cost.

Changes in ownership interest that result either in consolidation or deconsolidation of an investment are recorded at fair value through earnings, including the retained ownership interest, while changes that do not result in either consolidation or deconsolidation of a subsidiary are treated as equity transactions.

Use of Estimates – The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. While actual results could differ, management believes such estimates to be reasonable.

Operations – Linde is the largest industrial gases company worldwide. The company produces, sells and distributes atmospheric, process and specialty gases, and high-performance surface coatings to a diverse group of industries including aerospace, chemicals, food and beverage, electronics, energy, healthcare, manufacturing, and metals. Linde's Engineering Division offers its customers an extensive range of gas production and processing services including suppling plant components and services directly to customers.

Revenue Recognition – Effective January 1, 2018, Linde adopted the FASB's Accounting Standards Update No. 2014-09 ("ASC 606") relating to Revenue Recognition. Revenue is recognized as control of goods or services are transferred to customers in an amount that reflects the consideration to which an entity expects to be entitled to receive in exchange for the goods or services. Refer to footnote 21 for additional details regarding Linde revenue recognition policies. Prior to adoption of ASC 606 revenue was recognized when a firm sales agreement exists, collectability of a fixed or determinable sales price is reasonably assured, and when title and risks of ownership transfer to the customer for product sales or, in the case of other revenues when obligations are satisfied or services are performed. The adoption of ASC 606 resulted in no differences in revenue recognition compared to previous policies.

Cash Equivalents – Cash equivalents are considered to be highly liquid securities with original maturities of three months or less.

Inventories – Inventories are stated at the lower of cost or net realizable value. Cost is determined using the average-cost method.

Property, Plant and Equipment – Net – Property, plant and equipment are carried at cost, net of accumulated depreciation. The company capitalizes interest as part of the cost of constructing major facilities (see Note 10). Depreciation is calculated on the straight-line method based on the estimated useful lives of the assets, which range from 3 years to 40 years (see Note 10). Linde uses accelerated depreciation methods for tax purposes where appropriate. Maintenance of property, plant and equipment is generally expensed as incurred.

The company performs a test for impairment whenever events or changes in circumstances indicate that the carrying amount of an individual asset or asset group may not be recoverable. Should projected undiscounted future cash flows be less than the carrying amount of the asset or asset group, an impairment charge reducing the carrying amount to fair value is required. Fair value is determined based on the most appropriate valuation technique, including discounted cash flows.

Asset-Retirement Obligations – An asset-retirement obligation is recognized in the period in which sufficient information exists to determine the fair value of the liability with a corresponding increase to the carrying amount of the related property, plant and equipment which is then depreciated over its useful life. The liability is initially measured at discounted fair value and then accretion expense is recorded in each subsequent period. The company's asset-retirement obligations are primarily associated with its on-site long-term supply arrangements where the company has built a facility on land leased from the customer and is obligated to remove the facility at the end of the contract term. The company's asset-retirement obligations are not material to its consolidated financial statements.

Foreign Currency Translation – For most foreign operations, the local currency is the functional currency and translation gains and losses are reported as part of the accumulated other comprehensive income (loss) component of equity as a cumulative translation adjustment (see Note 9).

Financial Instruments – Linde enters into various derivative financial instruments to manage its exposure to fluctuating interest rates, currency exchange rates, commodity pricing and energy costs. Such instruments primarily include interest-rate swap and treasury rate lock agreements; currency-swap agreements; forward contracts; currency options; and commodity-swap agreements. These instruments are not entered into for trading purposes. Linde only uses commonly traded and non-leveraged instruments.

There are three types of derivatives the company enters into: (i) those relating to fair-value exposures, (ii) those relating to cash-flow exposures, and (iii) those relating to foreign currency net investment exposures. Fair-value exposures relate to recognized assets or liabilities, and firm commitments; cash-flow exposures relate to the variability of future cash flows associated with recognized assets or liabilities, or forecasted transactions; and net investment exposures relate to the impact of foreign currency exchange rate changes on the carrying value of net assets denominated in foreign currencies.

When a derivative is executed and hedge accounting is appropriate, it is designated as either a fair-value hedge, cash-flow hedge, or a net investment hedge. Currently, Linde designates all interest-rate and treasury rate locks as hedges for accounting purposes; however, currency contracts are generally not designated as hedges for accounting purposes unless they are related to forecasted transactions. Whether designated as hedges for accounting purposes or not, all derivatives are linked to an appropriate underlying exposure. On an ongoing basis, the company assesses the hedge effectiveness of all derivatives designated as hedges for accounting purposes to determine if they continue to be highly effective in offsetting changes in fair values or cash flows of the underlying hedged items. If it is determined that the hedge is not highly effective, then hedge accounting will be discontinued prospectively.

Changes in the fair value of derivatives designated as fair-value hedges are recognized in earnings as an offset to the change in the fair values of the underlying exposures being hedged. The changes in fair value of derivatives that are designated as cash-flow hedges are deferred in accumulated other comprehensive income (loss) and are reclassified to earnings as the underlying hedged transaction affects earnings. Any ineffectiveness is recognized in earnings immediately. Hedges of net investments in foreign subsidiaries are recognized in the cumulative translation adjustment component of accumulated other comprehensive income (loss) on the consolidated balance sheets to offset translation gains and losses associated with the hedged net investment. Derivatives that are entered into for risk-management purposes and are not designated as hedges (primarily related to anticipated net income and currency derivatives other than for firm commitments) are recorded at their fair market values and recognized in current earnings.

See Note 14 for additional information relating to financial instruments.

Goodwill – Acquisitions are accounted for using the acquisition method which requires allocation of the purchase price to assets acquired and liabilities assumed based on estimated fair values. Any excess of the purchase price over the fair value of the assets and liabilities acquired is recorded as goodwill. Allocations of the purchase price are based on preliminary estimates and assumptions at the date of acquisition and are subject to revision based on final information received, including appraisals and other analyses which support underlying estimates.

The company performs a goodwill impairment test annually in the second quarter or more frequently if events or circumstances indicate that an impairment loss may have been incurred. The applicable guidance allows an entity to first assess qualitative factors to determine if it is more likely than not that the fair value of a reporting unit is less than carrying value. If it is determined that it is more likely than not that the fair value of a reporting unit is less than carrying value then the company will estimate and compare the fair value of its reporting units to their carrying value, including goodwill. Reporting units are determined based on one level below the operating segment level. As applicable, fair value is determined through the use of projected future cash flows, multiples of earnings and sales and other factors. Such analysis requires the use of certain market assumptions and discount factors, which are subjective in nature.

See Notes 3 and 11 for additional information relating to goodwill.

Other Intangible Assets – Other intangible assets, primarily customer relationships and brands/tradenames, are amortized over the estimated period of benefit. The determination of the estimated period of benefit will be dependent upon the use and underlying characteristics of the intangible asset. Linde evaluates the recoverability of its intangible assets subject to amortization when facts and circumstances indicate that the carrying value of the asset may not be recoverable. If the carrying value is not recoverable, impairment is measured as the amount by which the carrying value exceeds its estimated fair value. Fair value is generally estimated based on either appraised value or other valuation techniques. Indefinite lived intangible assets related to the Linde brand are evaluated for impairment on an annual basis or more frequently if events or circumstances indicate an impairment loss may have occurred.

See Notes 3 and 12 for additional information relating to other intangible assets.

Assets Held for Sale and Discontinued Operations – Assets held for sale, as well as liabilities directly related to these assets, are classified separately in the consolidated balance sheets as held for sale if the requirements of the FASB's Accounting Standards Codification ("ASC") 360, *Property, Plant and Equipment*, are satisfied. The main requirements of ASC 360 are: (i) management having the authority to approve the action has committed to a plan to sell the assets and an active program to locate a buyer has been initiated, (ii) the assets are available for sale in their present condition at a reasonable market price, and (iii) a sale within the next twelve months is probable. Assets classified as held for sale are measured at the lower of carrying amount and fair value less costs to sell. Amortization and depreciation has been discontinued. The process involved in determining the fair value less costs to sell involves estimates and assumptions that are subject to uncertainty.

Discontinued operations are reported as soon as a business is classified as held for sale, or has already been disposed of, and when the business to be disposed of represents a strategic shift that has (or will have) a major effect on the company's operations and financial results. Businesses acquired with the intent of divesting are also required to be reported as discontinued operations. The profit/loss from discontinued operations is reported separately from the expenses and income from continuing operations in the consolidated statements of income. In the consolidated statement of cash flows, the cash flows from discontinued operations are shown separately from the cash flows from continuing operations. The information provided in the Notes relates to continuing operations. If the information relates exclusively to discontinued operations, this is highlighted accordingly.

See Note 4 for additional information relating to assets held for sale and discontinued operations.

Income Taxes – Deferred income taxes are recorded for the temporary differences between the financial statement and tax bases of assets and liabilities using currently enacted tax rates. Valuation allowances are established against deferred tax assets whenever circumstances indicate that it is more likely than not that such assets will not be realized in future periods.

Under the guidance for accounting for uncertainty in income taxes, the company can recognize the benefit of an income tax position only if it is more likely than not (greater than 50%) that the tax position will be sustained upon tax examination, based solely on the technical merits of the tax position. Otherwise, no benefit can be recognized. The tax benefits recognized are measured based on the largest benefit that has a greater than 50% likelihood of being realized upon ultimate settlement. Additionally, the company accrues interest and related penalties, if applicable, on all tax exposures for which reserves have been established consistent with jurisdictional tax laws. Interest and penalties are classified as income tax expense in the financial statements.

See Note 7 for additional information relating to income taxes, including the U.S. Tax Cuts and Jobs Act enacted in December 2017.

Retirement Benefits – Most Linde employees participate in a form of defined benefit or contribution retirement plan, and additionally certain employees are eligible to participate in various post-employment health care and life insurance benefit plans. The cost of contribution plans is recognized in the year earned while the cost of other plans is recognized over the employees' expected service period to the company, all in accordance with the applicable accounting standards. The funded status of the plans is recorded as an asset or liability in the consolidated balance sheets. Funding of retirement benefits varies and is in accordance with local laws and practices.

See Note 18 for additional information relating to retirement programs.

Share-based Compensation– The company has historically granted share-based awards which consist of stock options, restricted stock and performance-based stock. Share-based compensation expense is generally recognized on a straight-line basis over the stated vesting period. For stock awards granted to full-retirement-eligible employees, compensation expense is recognized over the period from the grant date to the date retirement eligibility is achieved. For performance-based awards, compensation expense is recognized only if it is probable that the performance condition will be achieved.

See Note 17 for additional disclosures relating to share-based compensation.

Reclassifications – Certain prior years' amounts have been reclassified to conform to the current year's presentation, including reclassifications on the consolidated statements of income and segment operating profit relating to the adoption of accounting guidance on the presentation of net periodic pension and postretirement benefit costs.

As a result of the merger, certain reclassifications of prior period amounts were made to improve comparability and conform with the current presentation. Presentation changes were made to the consolidated balance sheets. In addition, certain reclassifications of prior period data were made in the Notes to the Consolidated Financial Statements to conform with the current period presentation. These reclassifications include: (i) the reclassification of capitalized software from property plant and equipment - net to other intangibles - net (see Note 10), and (ii) the reclassification of VAT receivables and VAT payables from accounts receivable and accounts payable, respectively, to other current assets and other current liabilities, respectively, (see Note 9).

Recently Issued Accounting Standards

Accounting Standards Implemented in 2018

The following standards were effective for Linde in 2018 and their adoption did not have a significant impact on the consolidated financial statements:

- **Revenue Recognition** – In May 2014, the Financial Accounting Standards Board ("FASB") issued updated guidance on the reporting and disclosure of revenue. Effective January 1, 2018, Linde has adopted this guidance using the modified retrospective transition method. No material differences in revenue recognition accounting were identified under the new guidance compared with the company's historic revenue recognition accounting (see Note 21).

- **Classification of Certain Cash Receipts and Cash Payments** – In August 2016, the FASB issued updated guidance on the classification of certain cash receipts and cash payments within the statement of cash flows. The update provides accounting guidance for specific cash flow issues with the objective of reducing diversity in practice. The adoption of this guidance did not have a material impact on the financial statements.

- **Intra-Entity Asset Transfers** – In October 2016, the FASB issued updated guidance for income tax accounting of intra-entity transfers of assets other than inventory. The update requires an entity to recognize the income tax consequences of an intra-entity transfer of an asset other than inventory in the period when the transfer occurs. The adoption of this guidance did not have a material impact on the financial statements.

- **Pension Costs** - In March 2017, the FASB issued updated guidance on the presentation of net periodic pension cost and net periodic postretirement benefit cost. The new guidance requires the service cost component be reported in the same line item or items as other compensation costs arising from services rendered by employees during the period. The other components of net benefit cost are required to be presented in the income statement separately from the service cost component and not included within operating profit. This guidance was adopted in the first quarter 2018. Accordingly, non-service related components of net periodic pension and postretirement benefit costs were reclassified out of "Operating Profit" to "Net pension and OPEB cost (benefit), excluding service cost" using the practical expedient to use the amounts disclosed in the retirement benefits note for the prior comparative periods as the estimation basis for applying the retrospective presentation requirements (see Note 18).

- **Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income** – In February 2018, the FASB issued updated guidance which allows a reclassification from accumulated other comprehensive income to retained earnings for stranded tax effects resulting from the Tax Cuts and Jobs Act. The company adopted this guidance in the fourth quarter of 2018 resulting in a reclassification adjustment of $93 million.

Accounting Standards to be Implemented

- **Leases** – In February 2016, the FASB issued updated guidance on the accounting and financial statement presentation of leases. The new guidance requires lessees to recognize a right-of-use asset and lease liability for all leases, except those that meet certain scope exceptions, and would require expanded quantitative and qualitative disclosures. This guidance will be effective for the company beginning in the first quarter 2019 and requires companies to transition using a modified retrospective approach. Linde has implemented a new application to administer the accounting and disclosure requirements and is finalizing its determination of the impact the standard will have on its consolidated financial statements.

- **Credit Losses on Financial Instruments** – In June 2016, the FASB issued an update on the measurement of credit losses. The guidance introduces a new accounting model for expected credit losses on financial instruments, including trade receivables, based on estimates of current expected credit losses. This guidance will be effective for the company beginning in the first quarter 2020, with early adoption permitted beginning in the first quarter 2019 and requires companies to apply the change in accounting on a prospective basis. The company is currently evaluating the impact this update will have on the consolidated financial statements.

- **Simplifying the Test for Goodwill Impairment** – In January 2017, the FASB issued updated guidance on the measurement of goodwill. The new guidance eliminates the requirement to calculate the implied fair value of goodwill to measure a goodwill impairment charge. The guidance will be effective for the company beginning in the first quarter 2020 with early adoption permitted. The company does not expect this guidance to have a material impact.

- **Derivatives and Hedging** - In August 2017, the FASB issued updated guidance on accounting for hedging activities. The new guidance changes both the designation and measurement for qualifying hedging relationships and the presentation of hedge results. This guidance will be effective for the company beginning in the first quarter 2019. The company does not expect the standard to have a material impact on the consolidated financial statements.

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NOTE 3. BUSINESS COMBINATIONS

Merger of Praxair, Inc. and Linde AG

As described in Note 1, on October 31, 2018 Praxair and Linde AG combined their respective businesses through an all-stock transaction and became subsidiaries of the company.

In connection with the business combination, each share of common stock of Praxair par value $0.01 per share, (excluding any shares held in treasury immediately prior to the effective time of the merger, which were automatically canceled and retired for no consideration) was converted into one ordinary share, par value €0.001 per share, of Linde plc. Additionally, each tendered share of common stock of Linde AG was converted into 1.54 ordinary shares of Linde plc.

As provided in the business combination agreement, at the effective time of the business combination outstanding Praxair stock options and other equity awards were generally converted into stock options and equity awards on a 1:1 basis with respect to Linde shares. Outstanding Linde AG share-based compensation awards were either settled in cash (for the portion vested), or are required to be converted into similar stock options and equity awards with respect to Linde shares (for the portion unvested), after giving effect to the 1.54 exchange ratio. This grant is expected to occur in the first half of 2019. See Notes 16 and 17 for additional information.

Preliminary Allocation of Purchase Price

In accordance with the FASB's ASC 805, *"Business Combinations"*, Praxair was determined to be the accounting acquirer. As such, the company has applied the acquisition method of accounting with respect to the identifiable assets and liabilities of Linde AG, which have been measured at estimated fair value as of the date of the business combination.

In accordance with the business combination agreement, Linde AG shareholders that accepted the exchange offer received Linde shares in exchange for Linde AG shares at an exchange ratio of 1.54 Linde shares for each Linde AG share. Because Praxair is the accounting acquirer, the fair value of the equity issued by Linde plc to Linde AG shareholders in the exchange transaction was determined by reference to the market price of Praxair shares. Accordingly, the purchase consideration below reflects the estimated fair value of the 92% of Linde AG shares tendered and Linde shares issued in exchange for those Linde AG shares, which is based on the final closing price of Praxair shares prior to the effective time of the merger on October 31, 2018 of $164.50 per share.

The purchase price and estimated fair value of Linde AG's net assets acquired as of the merger date on October 31, 2018 is presented as follows:

(in thousands, except value per share data, Linde AG exchange ratio, and purchase price)

Linde AG common stock tendered as of October 31, 2018 (i)	170,875 Shares
Business combination agreement exchange ratio (ii)	1.54 : 1
Linde plc ordinary shares issued in exchange for Linde AG	263,148
Per share price of Praxair, Inc. common stock (iii)	$164.50
Purchase price (millions of dollars)	$43,288

(i) Number of Linde AG shares tendered in the 2017 Exchange Offer.

(ii) Exchange ratio for Linde AG shares as set forth in the business combination agreement.

(iii) Closing price of Praxair shares on the New York Stock Exchange prior to the effective time of the business combination on October 31, 2018.

In accordance with ASC 805, Linde AG's assets and liabilities were measured at estimated fair values at October 31, 2018, primarily using Level 3 inputs except debt which was Level 1. Estimates of fair value represent management's best estimate of assumptions about future events and uncertainties, including significant judgments related to future cash flows (sales, costs, customer attrition rates, and contributory asset charges), discount rates, competitive trends, market comparables, and others. Inputs used were generally obtained from historical data supplemented by current and anticipated market conditions and growth rates.

The following table summarizes the preliminary allocation of purchase price to the identifiable assets acquired and liabilities assumed by Linde, with the excess of the purchase price over the fair value of Linde AG's net assets recorded as goodwill. Due to the timing of the business combination, the magnitude of and multi-national nature of the net assets acquired, and the hold separate order (See Note 1) which deferred integration of the two merged companies, at December 31, 2018 the valuation process to determine the fair values is not complete and further adjustments are expected in 2019. The company has estimated the preliminary fair value of net assets acquired based on information currently available and will continue to adjust those estimates as additional information becomes available, analysis is able to be performed, refinement of market participant assumptions, finalization of tax returns in the pre-merger period and the application of push-down accounting at the subsidiary level. The areas where the fair value assessments are not finalized and, therefore, subject to adjustment during the measurement period relate primarily to identifiable intangible assets, property, plant and equipment, net assets held for sale, equity investments, income taxes, noncontrolling interests, contingencies and goodwill. As the company finalizes the fair value of assets acquired and liabilities assumed, additional purchase price allocation adjustments will be recorded during the measurement period, but no later than one year from the date of the acquisition. The company will reflect measurement period adjustments in the period in which the adjustments are determined.

Therefore, final determination of the fair values will likely result in further adjustments to the values presented in the following table:

Millions of dollars	**Estimated Fair Value**
Assets	
Cash and cash equivalents	$ 1,363
Accounts receivable – net	2,859
Inventories	1,452
Assets held for sale	5,180
Prepaid and other current assets	1,251
Property, plant and equipment	19,381
Equity investments	1,395
Goodwill	24,146
Other intangible assets	15,592
Other long-term assets	1,024
Total Assets Acquired	$ 73,643
Less: Liabilities Assumed	
Accounts payable	$ 3,360
Short-term debt	1,177
Current portion of long-term debt	1,864
Accrued taxes	159
Liabilities of assets held for sale	676
Other current liabilities	3,016
Long-term debt	6,295
Other long-term liabilities	1,908
Deferred credits, including deferred income taxes	6,754
Total Liabilities Assumed	$ 25,209
Less: Noncontrolling Interests	5,146
Purchase Price (i)	$ 43,288

(i) See above for the calculation of the purchase price.

Summary of Significant Fair Value Methods

The methods used to determine the fair value of significant identifiable assets and liabilities included in the preliminary allocation of purchase price are discussed below.

Inventories

Acquired inventory is comprised of finished goods, work in process and raw materials. The fair value of finished goods was calculated as the estimated selling price, adjusted for costs of the selling effort and a reasonable profit allowance relating to the selling effort. The fair value of work in process inventory was primarily calculated as the estimated selling price, adjusted for estimated costs to complete the manufacturing, estimated costs of the selling effort, as well as a reasonable profit margin on the remaining manufacturing and selling effort. The fair value of raw materials and supplies was determined based on replacement cost which approximates historical carrying value. The preliminary fair value step-up of inventories is being recognized in “Cost of sales” as the inventory is sold.

Assets held for sale and Liabilities of assets held for sale

As described in Note 1, as a condition of the European Commission ("EC"), the U.S. Department of Justice ("DOJ"), and other governmental regulatory authorities approval of the merger, Linde plc, Praxair and Linde AG were required to divest various businesses in Europe, the Americas and Asia. The fair value of these businesses has been determined based on the estimated net selling prices or sales agreements. Actual amounts may differ from this preliminary determination. See Note 4 for further information on merger-related divestitures.

Property, Plant and Equipment

The fair value of property, plant and equipment was primarily calculated using replacement costs adjusted for the age and condition of the asset, and is summarized below:

Property, plant and equipment ("PP&E")		**(in millions)**
Production plants	$	10,739
Storage tanks		1,809
Transportation equipment and other		574
Cylinders		2,493
Buildings		1,970
Land and improvements		647
Construction in progress		1,149
Preliminary fair value of PP&E	$	19,381

The final fair value determination for property, plant and equipment or estimates of remaining useful lives may differ from this preliminary determination.

Identifiable Intangible Assets

The fair value of identifiable intangible assets is summarized below:

	Weighted Average Amortization Period (in years)		**(in millions)**
Identifiable intangible assets			
Customer relationships	27	$	12,555
Linde Brand	Indefinite		1,648
Brands/Tradenames	27		578
Other intangibles	8		811
Preliminary fair value of identifiable intangible assets	26	$	15,592

The fair value estimate for all other identifiable intangible assets is based on assumptions that market participants would use in pricing an asset, based on the most advantageous market for the asset (i.e., its highest and best use). The final fair value determination for identifiable intangibles or estimates of remaining useful lives may differ materially from this preliminary determination.

The fair value of the customer relationships intangible asset was valued using a multi-period excess earnings method, a form of the income approach, which incorporates the estimated future cash flows to be generated from Linde AG’s existing customer base. Excess earnings are the earnings remaining after deducting the market rates of return on the estimated values of contributory assets, including debt-free net working capital, tangible assets, and other identifiable intangible assets. The excess earnings are thereby calculated for each year of multi-year projection periods and discounted to present value.

Brands/Tradenames includes $1,648 million related to the Linde brand which is considered to have an indefinite life. Other intangibles primarily includes acquired technology. These intangible assets were valued using the relief from royalty method under the income approach; this method estimates the cost savings generated by a company related to the ownership of an asset for which it would otherwise have had to pay royalties or license fees on revenues earned through the use of the asset and discounted to present value.

Pension and Other Postretirement Liabilities

Linde recognized a pretax net liability representing the unfunded portion of Linde AG's defined-benefit pension and other postretirement benefit ("OPEB") plans. Refer to Note 18 for further information on pensions and OPEB arrangements.

Long-Term Debt

The fair value for long-term debt was primarily obtained from third party quotes, as the majority of the Linde AG bond portfolio is publicly traded.

Deferred Income Tax Assets and Liabilities

The deferred income tax assets and liabilities include the expected future federal, state and foreign tax consequences associated with temporary differences between the preliminary fair values of the assets acquired and liabilities assumed and the respective tax bases. Tax rates utilized in calculating deferred income taxes generally represent the enacted statutory tax rates at the effective date of the merger in the jurisdictions in which legal title of the underlying asset or liability resides. The final fair value of deferred income tax assets and liabilities may differ from this preliminary determination.

Refer to Note 7 for further information related to income taxes.

Noncontrolling Interests

Noncontrolling interests include the fair value of noncontrolling interests of Linde AG, including approximately $3.2 billion relating to the 8% of Linde AG shares which were not tendered in the Exchange Offer and are intended to be the subject of a cash-merger squeeze-out. The company's wholly-owned indirect subsidiary, Linde Intermediate Holding AG "Linde Holding"), which directly owns the 92% of Linde AG shares acquired in the Exchange Offer, determined the adequate cash compensation to be paid to the 8% remaining Linde AG minority shareholders in exchange for the transfer of their Linde AG shares for each Linde AG share. The cash-merger squeeze-out was approved by the shareholders of Linde AG at an extraordinary shareholders meeting of Linde AG on December 12, 2018, but remains subject to court approval. Also, as required by German law, a guarantee was obtained from a financial institution guaranteeing the fulfillment of Linde Holding's obligations to pay the minority shareholders of Linde AG all amounts due in connection with the squeeze-out transaction. The remaining noncontrolling interests relate to the fair value of historic noncontrolling interests of Linde AG and its subsidiaries. The final fair value determination for noncontrolling interests may differ from this preliminary determination.

Equity Investments

The fair value of equity investments was determined using a discounted cash flow approach. The final fair value of equity investments may differ from this preliminary determination.

Other Assets Acquired and Liabilities Assumed (excluding Goodwill)

Linde utilized the carrying values, net of allowances, to value accounts and notes receivable and accounts payable as well as other current assets and liabilities as it was determined that carrying values represented the fair value of those items at the merger date.

Goodwill

The excess of the consideration for the merger over the preliminary fair value of net assets acquired was recorded as goodwill. The merger resulted in the recognition of $24,146 million of goodwill, which is not deductible for tax purposes. The goodwill balance is primarily attributed to the assembled workforce, expanded market opportunities and cost and other operating synergies anticipated upon the integration of the operations of Praxair and Linde AG. The push down of goodwill to reporting units is not final and may differ from this preliminary determination.

Results of Linde AG Operations Since Merger

The results of operations of Linde AG have been included in the company’s consolidated statements of income since the merger. The following table provides Linde AG “Sales” and “Income (loss) from continuing operations” included in the company's results since the merger.

Millions of dollars **Linde AG Results of Operations**		November 1, - December 31, 2018
Sales	$	2,873
Income (loss) from continuing operations*	$	(385)

* Includes net charges of $451 million related to the impacts of purchase accounting.

Unaudited Pro Forma Information

Linde's unaudited pro forma results presented below were prepared pursuant to the requirements of ASC 805 and give effect to the merger as if it had been consummated on January 1, 2017. The pro forma results have been prepared for comparative purposes only, and do not necessarily represent what the revenue or results of operations would have been had the merger been completed on January 1, 2017. In addition, these results are not intended to be a projection of future operating results and do not reflect synergies that might be achieved.

The unaudited pro forma results include adjustments for the preliminary purchase accounting impact (including, but not limited to, depreciation and amortization associated with the acquired tangible and intangible assets, amortization of the fair value adjustment to investment in nonconsolidated affiliates, and reduction of interest expense related to the fair value adjustment to long-term debt along with the related tax and non-controlling interest impacts), the alignment of accounting policies, adjustments due to IFRS compliant reporting conversion to U.S. GAAP and the elimination of transactions between Praxair and Linde AG.

The unaudited pro forma results for all periods presented below exclude the results of operations of the Linde AG merger-related divestitures (See Note 4) as these divestitures are reflected as discontinued operations. The Praxair merger-related divestitures (See Note 4) are included in the results from continuing operations, including the results from Praxair's European business through the disposition date of December 3, 2018, in the unaudited pro forma results presented below, for all periods presented, as these divestitures do not qualify for discontinued operations.

The unaudited pro forma results are summarized below:

Millions of dollars		2018		2017
Sales (a)	$	29,774	$	28,449
Income from continuing operations	$	4,739	$	871

(a) Includes sales from Praxair's merger-related divestitures of $1,625 million and $1,553 million for the years ended December 31, 2018 and 2017, respectively.

Significant nonrecurring amounts reflected in the pro forma results are as follows:

A $3,294 million gain ($2,923 million after tax) was recorded in the fourth quarter 2018 as a result of the divestiture of Praxair's European industrial gases business and is included in the December 31, 2018 pro forma income from continuing operations.

From January 1, 2017 through December 31, 2018, Praxair, Inc. and Linde AG collectively incurred pre-tax costs of $736 million ($680 million after tax) to prepare for and close the merger. These merger costs were reflected within the results of operations in the pro forma results as if they were incurred on January 1, 2017. Any costs incurred related to merger-related divestitures and integration and to prepare for the intended business separations were reflected in the pro forma results in the period in which they were incurred.

The company incurred pre-tax charges of $368 million ($279 million after tax) and $10 million ($8 million after tax) in 2018 related to the fair value step-up of inventories acquired and sold as well as a pension settlement due to the payout to certain participants as a result of change in control provisions within a U.S. nonqualified pension plan, respectively. The 2018 pro forma results were adjusted to exclude these charges. The pro forma results for 2017 were adjusted to include these charges, as well as charges incurred subsequent to December 31, 2018 but less than a year from the date of the merger of $13 million ($10 million after tax) related to the remaining fair value step-up of inventories to be sold and $51 million ($40 million after tax) related to an additional pension settlement within the U.S. nonqualified pension plan will occur in the first quarter of 2019 upon payment. See Note 18 for further information relating to the U.S. nonqualified pension plan settlements.

2018 Non-Merger Related Acquisitions

Non-merger related acquisitions of $25 million during the year ended December 31, 2018 are not material individually or in the aggregate.

2017 Acquisitions

During the year ended December 31, 2017, Linde had acquisitions totaling $33 million, primarily acquisitions of packaged gas businesses and a carbon dioxide joint venture in North America. These transactions resulted in goodwill and other intangible assets of $24 million and $3 million, respectively (see Notes 11 and 12).

2016 Acquisitions

During the year ended December 31, 2016, Linde had acquisitions totaling $363 million, primarily the acquisition of Yara International ASA's European carbon dioxide business ("European CO2 business") and packaged gases businesses in North America and Europe. These transactions resulted in goodwill and other intangible assets of $141 million and $82 million, respectively (see Notes 11 and 12). In addition, Linde purchased a remaining 34% share in a Scandinavian joint venture for $104 million (see Note 16).

On June 1, 2016 Linde completed an acquisition of a European CO2 business, which is a leading supplier of liquid CO2 and dry ice primarily to the European food and beverage industries. The business operates CO2 liquefaction plants and dry ice production facilities across the UK, Ireland, Norway, Denmark, Germany, Netherlands, Belgium, France and Italy. This acquisition was accounted for as a business combination; accordingly, the results of operations were consolidated from June 1, 2016 in the European business segment.

The purchase price for the acquisition was approximately $230 million (€206 million) and resulted in $121 million of intangible assets. The intangible assets primarily consist of $69 million of goodwill and $51 million of customer relationships that will be amortized over their estimated life of 20 years. This business was subsequently sold as part of the merger Divestitures (see Note 4).

NOTE 4. MERGER-RELATED DIVESTITURES, DISCONTINUED OPERATIONS AND NET ASSETS HELD FOR SALE

As described in Note 1, as a condition of the European Commission ("EC"), the U.S. Department of Justice ("DOJ"), and other governmental regulatory authorities approval of the merger, Linde plc, Praxair and Linde AG were required to divest the following businesses:

Praxair Merger-Related Divestitures - Primarily European Industrial Gases Business

As a condition of the EC regulatory approval of the merger transaction, Praxair agreed to sell the majority of its industrial gases business in Europe. The sale was completed on December 3, 2018 in two transactions, as described below:

- The Società Italiana Acetilene e Derivati S.p.A. ("SIAD") Sale and Purchase Agreement dated December 5, 2017 whereby Praxair agreed, *inter alia*, to sell its 34% non-controlling participation in its Italian joint venture SIAD to its joint venture partner Flow Fin in exchange for Flow Fin's 40% non-controlling participation in Praxair's majority-owned Italian joint venture, Rivoira S.p.A., and cash payment of a net purchase price of €90 million ($102 million as of October 31, 2018) by Praxair to Flow Fin. This transaction was completed on October 31, 2018, and;

- The Praxair Europe Sale and Purchase Agreement dated July 5, 2018 pursuant to which Praxair sold the majority of its European businesses to Taiyo Nippon Sanso Corporation for €5,000 million in cash consideration ($5,700 million at December 3, 2018), reduced by estimated normal closing adjustments of €86 million ($96 million). These transactions were completed on December 3, 2018.

In connection with these transactions, the company recognized a net pre-tax gain of $3,294 million ($2,923 million after tax) in the consolidated statements of income and related to the Europe segment.

The net carrying value of Praxair's European business assets and liabilities divested on December 3, 2018 is presented below:

Millions of dollars	Carrying Value
Assets	
Cash and cash equivalents	$ 38
Accounts receivable – net	311
Inventories	67
Prepaid and other current assets	22
Property, plant and equipment – net	1,342
Equity investments	234
Goodwill	620
Other intangible assets – net	115
Other long-term assets	36
Total Assets Divested	$ 2,785
Liabilities	
Accounts payable	$ 215
Accrued taxes	27
Other current liabilities	111
Long-term debt	2
Other long-term liabilities	92
Deferred credits	174
Total Liabilities Divested	$ 621
Noncontrolling interests	$ 200
Accumulated other comprehensive income (loss)	
Pension/OPEB funded status obligation, net of taxes	(8)
Cumulative translation adjustment, net of taxes	(318)
Net Assets Divested	$ 2,290

Additionally, to satisfy regulatory requirements to consummate the business combination, Praxair agreed to the following transactions which will be completed during 2019:

- Praxair's Chilean business which will be sold as part of the Americas' SPA (as defined below) for $21 million proceeds which is further described below.

- Various transactions within China, India and South Korea.

2018 sales related to these businesses were approximately $160 million.

Effective October 22, 2018, the date of final regulatory approvals, these businesses have been accounted for as Assets Held for Sale on the Consolidated Balance Sheets. These businesses were evaluated for discontinued operations accounting treatment under U.S. GAAP and it was determined that they did not meet the definition of a discontinued operation as these transactions did not represent a strategic shift with a major effect, after considering the impact of the merger.

Linde AG Merger-Related Divestitures - Primarily Americas Industrial Gases Business

As a condition of the U.S. regulatory approval of the merger, Linde AG agreed to sell the majority of its industrial gases business in the Americas, as described below:

- The Linde AG Americas Sales and Purchase Agreement, dated July 16, 2018, as and further amended on September 22, 2018, October 19, 2018, and February 20, 2019 whereby Linde AG and Praxair, Inc. entered into an agreement with a consortium comprising companies of the German industrial gases manufacturer Messer Group and CVC Capital Partners Fund VII to sell the majority of Linde AG's industrial gases business in North America and certain industrial gases business activities of Linde AG's in South America for $2.97 billion in cash consideration after purchase price adjustments for certain items relating to assets and liabilities of the sold businesses. In addition, divestitures include $531 million of proceeds for incremental plant sales within the Americas under other agreements. These transactions were completed on March 1, 2019.

- Various transactions within China, India and South Korea.

Discontinued Operations

Only the sales of the Linde AG merger-related divestitures meet the criteria for discontinued operations, Praxair merger-related divestitures do not qualify as discontinued operations. As such, operations related to the Linde AG merger-related divestitures are included within Income from discontinued operations, net of tax for periods subsequent to the merger, as summarized below:

Millions of dollars		November 1, - December 31, 2018
Net sales	$	388
Cost of sales		173
Other operating costs		90
Operating profit	$	125
Income from equity investments		1
Income taxes		9
Income from discontinued operations, net of tax	$	117
Noncontrolling interests		(9)
Income from discontinued operations, net of tax and noncontrolling interests	$	108

For the year ended December 31, 2018 there were no material amounts of depreciation, amortization, capital expenditures, or significant operating or investing non-cash items related to discontinued operations.

Net Assets Held for Sale

Net assets held for sale includes both the Linde AG merger-related divestitures that meet the criteria for discontinued operations and the Praxair merger-related divestitures that do not. As of December 31, 2018, the following assets and liabilities are reported as components of the net assets held for sale in the consolidated balance sheets:

Millions of dollars		Carrying / Fair Market Value
Assets		
Cash and cash equivalents	$	182
Accounts receivable – net		297
Inventories		209
Prepaid and other current assets		54
Property, plant and equipment – net		2,005
Other Assets		187
Asset adjustments for estimated fair value (Note 3)		2,564
Total Assets Classified as Assets Held for Sale	$	5,498
Liabilities		
Accounts payable		125
Deferred credits		206
Other liabilities		437
Total Liabilities Classified as Assets Held for Sale		768

Net Assets Classified as Held for Sale	$	4,730

NOTE 5. TRANSACTION COSTS AND OTHER CHARGES

2018 Charges

Transaction costs and other charges were $309 million for the year ended December 31, 2018 ($306 after-tax and noncontrolling interests, or $0.92 per diluted share).

Transaction Costs

On October 31, 2018, Praxair and Linde AG combined under Linde plc, as contemplated by the business combination agreement (see Note 1). In connection with the business combination, Linde incurred transaction costs which totaled $236 million for the year ended December 31, 2018 ($236 million after-tax).

Other Charges

Also included in Transaction costs and other charges are other charges of $73 million for the year ended December 31, 2018 ($70 million after-tax) comprised of the following; (i) a $40 million charge ($40 million after-tax) related to an unfavorable development related to a supplier contract in China, (ii) restructuring charges of $21 million ($18 million after-tax) and (iii) a $12 million charge ($12 million after-tax) associated with the transition to hyper-inflationary accounting in Argentina.

2017 Charges

Transaction Costs

In connection with the intended business combination, Linde incurred transaction costs which totaled $52 million for the year ended December 31, 2017 ($48 million after-tax or $0.17 per diluted share).

2016 Charges

Cost Reduction Program and Other Charges

In the third quarter of 2016, Linde recorded pre-tax charges totaling $96 million ($63 million after-tax and noncontrolling interests of $0.22 per diluted share). Following is a summary of the pre-tax charge by reportable segment:

(millions of dollars)	Severance costs	Other Charges	Total
North America	$ 14	$ 29	$ 43
Europe	12	3	15
South America	5	7	12
Asia	6	13	19
Surface Technologies	3	4	7
Total	$ 40	$ 56	$ 96

The severance costs of $40 million are for the elimination of 730 positions. The other charges of $56 million are primarily related to (i) the consolidation of operations for efficiencies and cost reduction primarily in North America and Surface Technologies, (ii) integration costs for acquisitions in Europe and North America, and (iii) asset write-downs and other charges related to the impacts of weaker underlying industrial activity, primarily in the Americas and Asia. Amounts related to asset write-downs are net of expected sale proceeds, which are not significant.

The total cash requirement of the cost reduction program and other charges was approximately $50 million. The actions are completed.

Classification in the consolidated financial statements

The pre-tax charges for each year are shown within operating profit in a separate line item on the consolidated statements of income. In the consolidated balance sheets, reductions in assets are recorded against the carrying value of the related assets and unpaid amounts are recorded primarily as short-term liabilities. On the consolidated statement of cash flows, the pre-tax impact of these charges, net of cash payments, is shown as an adjustment to reconcile net income to net cash provided by operating activities. In Note 20 - Segment Information, Linde excluded these charges from its management definition of segment operating profit; a reconciliation of segment operating profit to consolidated operating profit is shown within the segment operating profit table.

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NOTE 6. LEASES

In the normal course of its business, Linde enters into various leases as the lessee, primarily involving manufacturing and distribution equipment and office space. Total lease and rental expenses under operating leases were $193 million in 2018, $146 million in 2017 and $141 million in 2016. The increase in 2018 is a result of the merger.

At December 31, 2018, minimum payments due under operating leases are as follows:

(Millions of dollars)		
2019	$	305
2020		236
2021		186
2022		145
2023		102
Thereafter		326
	$	1,300

Capital leases are included in property, plant and equipment – net (see Note 10). Related obligations are included in debt. Capital lease expense is recognized as part of depreciation and interest.

At December 31, 2018, minimum payments due under capital leases are as follows:

(Millions of dollars)		
2019		18
2020		17
2021		12
2022		10
2023		5
Thereafter		42
	$	104
Finance charge included in minimum lease payments	$	23

Linde's leases where it is the lessor are not material.

NOTE 7. INCOME TAXES

The year ended December 31, 2018 reflects Praxair for the entire year and the Linde AG for the period beginning October 31, 2018 (the merger date), including the impacts of purchase accounting. The amounts for historical periods prior to 2018 solely reflect the results of Praxair. See Notes 1 and 3.

Pre-tax income applicable to U.S. and foreign operations is as follows:

(Millions of dollars) **Year Ended December 31,**		**2018**		**2017**		**2016**
United States	$	931	$	1,003	$	954
Foreign (a)		4,118		1,284		1,094
Total income before income taxes	$	5,049	$	2,287	$	2,048

(a) includes a $3,294 million gain related to Europe divestiture (see Notes 4 and 9).

U.S. Tax Cuts and Jobs Act (Tax Act)

On December 22, 2017 the U.S. government enacted the Tax Cuts and Jobs Act ("Tax Act"). This comprehensive tax legislation significantly revised the U.S. corporate income tax rules by, among other things, lowering the corporate income tax rate from 35% to 21%, implementing a territorial tax system and imposing a one-time tax on accumulated earnings of foreign subsidiaries. Given the substantial uncertainties surrounding the Tax Act and the short period of time between December 22, 2017 and December 31, 2017 to calculate the U.S. Federal, U.S. state, and non-U.S. tax impacts of the Tax Act, at December 31, 2017 the company accounted for its income tax charge on a provisional (estimated) basis as allowed by SEC Staff Accounting Bulletin No. 118 ("SAB 118"). The company's 2017 net provisional income tax charge of $394 million has three main components: (i) an estimated $467 million U.S. Federal and state tax charge for deemed repatriation of accumulated foreign earnings; (ii) an estimated $260 million charge for foreign withholding taxes related to anticipated future repatriation of foreign earnings; and (iii) an estimated $333 million deferred tax benefit for the revaluation of net deferred tax liabilities from 35% to the new 21% tax rate. The $467 million U.S. federal and state tax charge for deemed repatriation of accumulated foreign earnings includes $422 million of deemed repatriation tax payable over eight years, of which $388 million is classified as of December 31, 2017 as other long-term liabilities on the consolidated balance sheets (see Note 9).

During 2018, the company continued to evaluate the Tax Act, additional guidance from the Internal Revenue Service, its historical foreign earnings and taxes and other items that could impact its net provisional tax charge. Additionally, the company continued to review its foreign capital structures, organizational cash needs and the foreign withholding tax cost of planned repatriation. In the fourth quarter of 2018, the company completed its accounting and updated its provisional estimates in accordance with SAB 118 resulting in a net reduction to tax expense of $61 million, $41 million U.S. federal and $20 million of state income tax (net of federal tax benefit). This resulted in a deemed repatriation tax payable of $291 million payable over the remaining seven years, of which $265 million is classified as of December 31, 2018 as other long-term liabilities on the consolidated balance sheets (see Note 9).

Further, the Tax Act enacted new provisions related to the taxation of foreign earnings, known as GILTI. The company has elected as an accounting policy to account for GILTI as period costs when incurred.

Additionally, in the fourth quarter of 2018 the company adopted Accounting Standards Update 2018-02, "Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income", electing to reclassify the income tax effects of the Tax Act from Accumulated Other Comprehensive Income ("AOCI") to retained earnings. This resulted in a net reduction to AOCI and a net increase to retained earnings of $93 million, $98 million directly related to the federal income tax rate change reduced by $5 million indirectly related to the federal tax rate change on state income taxes.

Provision for Income Taxes

The following is an analysis of the provision for income taxes:

(Millions of dollars) **Year Ended December 31,**	**2018 (a)**	**2017 (a)**	**2016**
Current tax expense (benefit)			
U.S. federal	$ 390	$ 565	$ 266
State and local	(7)	84	32
Foreign	620	374	266
	1,003	1,023	564
Deferred tax expense (benefit)			
U.S. federal	8	(221)	3
State and local	15	19	7
Foreign	(209)	205	(23)
	(186)	3	(13)
Total income taxes	$ 817	$ 1,026	$ 551

(a) Includes a benefit of $61 million and a charge of $394 million related to the Tax Act in 2018 and 2017, respectively and a charge of $371 million related to divestitures in 2018 (see Note 4) as follows:

	2018	2017
Current tax expense (benefit)		
U.S. federal	$ 219	$ 414
State and local	(36)	53
Foreign	114	60
	297	527
Deferred tax expense (benefit)		
U.S. federal	6	(333)
State and local	7	—
Foreign	—	200
	13	(133)
Total income taxes	$ 310	$ 394

Effective Tax Rate Reconciliation

For purposes of the effective tax rate reconciliation, the company utilized the U.S. statutory income tax rate of 21% in 2018 and 35% in years 2017 and 2016. An analysis of the difference between the provision for income taxes and the amount computed by applying the U.S. statutory income tax rate to pre-tax income follows:

(Dollar amounts in millions) Year Ended December 31,	2018		2017		2016	
U.S. statutory income tax	$ 1,060	21.0 %	$ 801	35.0 %	$ 717	35.0 %
State and local taxes – net of federal benefit	30	0.6 %	32	1.4 %	28	1.4 %
U.S. tax credits and deductions (a)	(12)	(0.2)%	(27)	(1.2)%	(32)	(1.6)%
Foreign tax differentials (b)	57	1.1 %	(145)	(6.3)%	(140)	(6.8)%
Share Based Compensation	(22)	(0.4)%	(35)	(1.5)%	(20)	(1.0)%
Tax Act	(61)	(1.2)%	394	17.2 %	—	— %
Divestitures (c)	(321)	(6.4)%	—	— %	—	— %
Other – net (d)	86	1.7 %	6	0.3 %	(2)	(0.1)%
Provision for income taxes	$ 817	16.2 %	$ 1,026	44.9 %	$ 551	26.9 %

(a) U.S. tax credits and deductions relate to foreign derived intangible income in 2018, the research and experimentation tax credit in 2018, 2017 and 2016 and manufacturing deduction in years 2017 and 2016.

(b) Primarily related to differences between the U.S. tax rate (21% in year 2018 and 35% in years 2017 and 2016) and the statutory tax rate in the countries where the company operates. Other permanent items and tax rate changes were not significant.

(c) Divestitures primarily relate to the sale of the company's European business (see Note 4).

(d) Other - net includes $34 million of U.S tax related to GILTI in 2018 and an increase in unrecognized tax benefits in Europe of $44 million.

__Net Deferred Tax Liabilities__

Net deferred tax liabilities included in the consolidated balance sheets are comprised of the following:

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(Millions of dollars) December 31,		2018		2017
Deferred tax liabilities				
Fixed assets	$	3,935	$	1,128
Goodwill		124		143
Other intangible assets		3,684		72
Subsidiary/equity investments		570		200
Other		648		93
	$	8,961	$	1,636
Deferred tax assets				
Carryforwards	$	526	$	209
Benefit plans and related (a)		575		257
Inventory		63		16
Accruals and other (b)		1,112		261
	$	2,276	$	743
Less: Valuation allowances (c)		(237)		(76)
	$	2,039	$	667
Net deferred tax liabilities	$	6,922	$	969
Recorded in the consolidated balance sheets as (Note 9):				
Other long-term assets		510		198
Deferred credits		7,432		1,167
	$	6,922	$	969

(a) Includes deferred taxes of $292 million and $217 million in 2018 and 2017, respectively, related to pension / OPEB funded status (see Notes 9 and 18).

(b) Includes $104 million and $130 million in 2018 and 2017, respectively, related to research and development costs.

(c) Summary of valuation allowances relating to deferred tax assets follows (millions of dollars):

		2018		2017		2016
Balance, January 1,	$	(76)	$	(132)	$	(123)
Income tax (charge) benefit (i)		(51)		59		(13)
Merger with Linde AG		(121)		—		—
Other, including write-offs		7		—		6
Translation adjustments		4		(3)		(2)
Balance, December 31,	$	(237)	$	(76)	$	(132)

(i) 2017 includes a $59 million benefit related to the utilization of foreign tax credits under the Tax Act.

The company evaluates deferred tax assets quarterly to ensure that estimated future taxable income will be sufficient in character (e.g., capital gain versus ordinary income treatment), amount and timing to result in their recovery. After considering the positive and negative evidence, a valuation allowance is established to reduce the assets to their realizable value when management determines that it is more likely than not (i.e., greater than 50% likelihood) that a deferred tax asset will not be realized. Considerable judgment is required in establishing deferred tax valuation allowances.

At December 31, 2018, the company had $526 million of deferred tax assets relating to net operating losses ("NOLs") and tax credits and $237 million of valuation allowances. These deferred tax assets include $445 million relating to NOLs of which $55 million expire within 5 years, $125 million expire after 5 years and $265 million have no expiration. The deferred tax assets also include $81 million related to credits of which $13 million expire within 5 years, $38 million expire after 5 years, and $30 million have no expiration. The valuation allowances of $237 million primarily relate to NOLs and are required because management has determined, based on financial projections and available tax strategies, that it is unlikely that the NOLs will be utilized before they expire. If events or circumstances change, valuation allowances are adjusted at that time resulting in an income tax benefit or charge.

The company has $570 million of foreign income taxes accrued related to its investments in subsidiaries and equity investments as of December 31, 2018. A provision has not been made for any additional foreign income tax at December 31, 2018 on approximately $30 billion related to its investments in subsidiaries because the company intends to remain indefinitely reinvested. While the $30 billion could become subject to additional foreign income tax if there is a sale of a subsidiary or earnings are remitted as dividends, it is not practicable to estimate the unrecognized deferred tax liability.

Uncertain Tax Positions

Unrecognized income tax benefits represent income tax positions taken on income tax returns but not yet recognized in the consolidated financial statements. The company has unrecognized income tax benefits totaling $319 million, $54 million and $56 million as of December 31, 2018, 2017 and 2016, respectively. If recognized, essentially all of the unrecognized tax benefits and related interest and penalties would be recorded as a benefit to income tax expense on the consolidated statement of income.

A reconciliation of the beginning and ending amount of unrecognized tax benefits is as follows:

(Millions of dollars)	2018	2017	2016
Unrecognized income tax benefits, January 1	$ 54	$ 56	$ 68
Additions for tax positions of prior years (a)	104	48	6
Reductions for tax positions of prior years	(7)	(26)	(15)
Additions for current year tax positions (b)	179	—	—
Reductions for settlements with taxing authorities (c)	(3)	(26)	(2)
Foreign currency translation and other	(8)	2	(1)
Unrecognized income tax benefits, December 31	$ 319	$ 54	$ 56

(a) Increase primarily relates to tax positions in the United States and Europe.

(b) 2018 includes $167 million related to the merger with Linde AG.

(c) Settlements are uncertain tax positions that were effectively settled with the taxing authorities, including positions where the company has agreed to amend its tax returns to eliminate the uncertainty.

The company classifies interest income and expense related to income taxes as tax expense in the consolidated statement of income. The company recognized net interest expense of $32 million in 2018, net interest expense of $8 million in 2017, and net interest income of $10 million in 2016. The company had $48 million and $8 million of accrued interest and penalties as of December 31, 2018 and December 31, 2017, respectively which were recorded in other long-term liabilities in the consolidated balance sheets (see Note 9).

As of December 31, 2018, the company remained subject to examination in the following major tax jurisdictions for the tax years as indicated below:

Major tax jurisdictions	Open Years
North and South America	
United States	2014 through 2018
Canada	2011 through 2018
Mexico	2012 through 2018
Brazil	2005 through 2018
Europe and Africa	
Belgium	2013 through 2018
Germany	2011 through 2018
Luxembourg	2013 through 2018
Netherlands	2013 through 2018
Republic of South Africa	2014 through 2018
Scandinavia	2008 through 2018
Spain	2004 through 2018
United Kingdom	2015 through 2018
Asia and Australia	
Australia	2013 through 2018
China	2008 through 2018
India	2006 through 2018
Korea	2013 through 2018
New Zealand	2014 through 2018
Taiwan	2014 through 2018

The company is currently under audit in a number of jurisdictions. As a result, it is reasonably possible that some of these matters will conclude or reach the stage where a change in unrecognized income tax benefits may occur within the next twelve months. At the time new information becomes available, the company will record any adjustment to income tax expense as required. Final determinations, if any, are not expected to be material to the consolidated financial statements. The company is also subject to income taxes in many hundreds of state and local taxing jurisdictions that are open to tax examinations.

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NOTE 8. EARNINGS PER SHARE – LINDE PLC SHAREHOLDERS

Basic and Diluted earnings per share - Linde plc shareholders is computed by dividing Income From Continuing Operations, Income From discontinued operations, net of tax, and Net income – Linde plc for the period by the weighted average number of either basic or diluted shares outstanding, as follows:

	2018	2017	2016
Numerator (millions of dollars)			
Income From Continuing Operations	$ 4,273	$ 1,247	$ 1,500
Income from discontinued operations, net of tax	108	—	—
Net Income – Linde plc	$ 4,381	$ 1,247	$ 1,500
Denominator (thousands of shares)			
Weighted average shares outstanding	330,088	285,893	285,289
Shares earned and issuable under compensation plans	313	368	388
Weighted average shares used in basic earnings per share *	330,401	286,261	285,677
Effect of dilutive securities			
Stock options and awards	3,726	2,853	2,080
Weighted average shares used in diluted earnings per share *	334,127	289,114	287,757
Basic earnings per share from continuing operations	$ 12.93	$ 4.36	$ 5.25
Basic earnings per share from discontinued operations	$ 0.33	$ —	$ —
Basic Earnings Per Share	$ 13.26	$ 4.36	$ 5.25
Diluted earnings per share from continuing operations	$ 12.79	$ 4.32	$ 5.21
Diluted earnings per share from discontinued operations	$ 0.32	$ —	$ —
Diluted Earnings Per Share	$ 13.11	$ 4.32	$ 5.21

* As a result of the merger, share amounts for the year ended December 31, 2018 reflect a weighted average effect of Praxair shares outstanding prior to October 31, 2018 and Linde plc shares outstanding on and after October 31, 2018.

There were no antidilutive shares for the years ended December 31, 2018 or 2017. Stock options of 2,602,770 for the year ended December 31, 2016 were antidilutive and therefore excluded in the computation of diluted earnings per share.

NOTE 9. SUPPLEMENTAL INFORMATION

The year ended December 31, 2018 reflects Praxair for the entire year and the Linde AG for the period beginning after October 31, 2018 (the merger date), including the impacts of purchase accounting. The amounts for historical periods prior to 2018 solely reflect the results of Praxair. See Notes 1 and 3.

Income Statement

(Millions of dollars) **Year Ended December 31,**	2018	2017	2016
Selling, General and Administrative			
Selling	$ 757	$ 511	$ 493
General and administrative	872	696	652
	$ 1,629	$ 1,207	$ 1,145

Year Ended December 31,	2018	2017	2016
Depreciation and Amortization (a)			
Depreciation	$ 1,615	$ 1,093	$ 1,028
Amortization of other intangibles (Note 12)	215	91	94

$	1,830	$	1,184	$	1,122

Year Ended December 31,	2018	2017	2016
Other Income (Expenses) – Net			
Currency related net gains (losses)	$ 4	$ (3)	$ 1
Partnership income	8	6	5
Severance expense	(7)	(6)	(7)
Asset divestiture gains (losses) – net	6	4	16
Other – net	7	3	8
	$ 18	$ 4	$ 23

Year Ended December 31,	2018	2017	2016
Interest Expense – Net			
Interest incurred on debt	$ 196	$ 189	$ 208
Interest capitalized	(20)	(28)	(34)
Bond redemption (b)	26	—	16
	$ 202	$ 161	$ 190

Year Ended December 31,	2018	2017	2016
Income Attributable to Noncontrolling Interests			
Noncontrolling interests' operations (c)	$ 12	$ 59	$ 35
Redeemable noncontrolling interests' operations (Note 16)	3	2	3
Noncontrolling interests from continuing operations	$ 15	$ 61	$ 38
Noncontrolling interests from discontinued operations	$ 9	$ —	$ —

Balance Sheet

(Millions of dollars) December 31,	2018	2017
Accounts Receivable		
Trade	$ 4,368	$ 1,814
Other	42	34
	4,410	1,848
Less: allowance for doubtful accounts (d)	(113)	(138)
	$ 4,297	$ 1,710

December 31,	2018	2017
Inventories		
Raw materials and supplies	$ 339	$ 224
Work in process	321	57
Finished goods	991	333
	$ 1,651	$ 614

December 31,	2018	2017
Prepaid and Other Current Assets		
Prepaid (e)	367	185
VAT Recoverable	250	94
Other	460	65
	$ 1,077	$ 344

December 31,	2018	2017
Other Long-term Assets		
Pension assets (Note 18)	$ 140	$ 17
Insurance contracts (f)	75	74
Long-term receivables, net (g)	135	54
Deposits	61	70
Investments carried at cost	76	12
Deferred charges	148	47
Deferred income taxes (Note 7)	510	198
Other	317	109
	$ 1,462	$ 581

December 31,	2018	2017
Other Current Liabilities		
Accrued expenses	$ 1,187	$ 319
Payroll	658	170
VAT Payable	235	50
Deferred Income	242	9
Pension and postretirement (Note 18)	117	30
Interest payable	137	81
Employee benefit accrual	104	23
Insurance reserves	36	12
Other	1,042	232
	$ 3,758	$ 926

December 31,	2018	2017
Other Long-term Liabilities		
Pension and postretirement (Note 18)	$ 2,004	$ 851
Tax liabilities for uncertain tax positions	191	35
Tax Act liabilities for deemed repatriation (Note 7)	265	388
Interest and penalties for uncertain tax positions (Note 7)	48	8
Insurance reserves	24	23
Other	903	283
	$ 3,435	$ 1,588

December 31,	2018	2017
Deferred Credits		
Deferred income taxes (Note 7)	$ 7,432	$ 1,167
Other	179	69
	$ 7,611	$ 1,236

December 31,	2018	2017
Accumulated Other Comprehensive Income (Loss)		
Cumulative translation adjustment - net of taxes:		
North America (h)	$ (955)	$ (885)
South America (h)	(2,347)	(2,004)
Europe (h)	(185)	(398)
Asia (h)	(300)	(151)
Surface Technologies	(34)	(17)
Linde AG (h)	231	—
	(3,590)	(3,455)
Derivatives – net of taxes	(2)	(1)
Unrealized gain (loss) on securities	(1)	—
Pension/OPEB funded status obligation (net of $292 million and $347 million tax benefit in 2018 and 2017) (Note 18)	(863)	(642)
	$ (4,456)	$ (4,098)

(a) Capitalized software has been reclassified from property plant and equipment - net to other intangibles - net. The associated expense has been reclassified from depreciation expense to amortization expense. The impact of this reclassification was $40 million and $43 million in 2018 and 2017, respectively. 2018 depreciation and amortization expense include $225 million and $121 million, respectively, of Linde AG purchase accounting impacts.

(b) In December 2018, Linde repaid $600 million of 4.50% notes due 2019 and €600 million of 1.50% notes due 2020 resulting in a $26 million interest charge ($20 million after-tax, or $0.06 per diluted share). In February 2016, Linde redeemed $325 million of 5.20% notes due March 2017 resulting in a $16 million interest charge ($10 million after-tax, or $0.04 per diluted share).

(c) Noncontrolling interests from continuing operations includes a $35 million charge in 2018 related to the 8% of Linde AG Shares which were not tendered in the Exchange Offer (see Note 3).

(d) Provisions to the allowance for doubtful accounts were $25 million, $33 million, and $41 million in 2018, 2017, and 2016, respectively. The allowance activity in each period related primarily to write-offs of uncollectible amounts, net of recoveries and currency movements.

(e) Includes estimated income tax payments of $172 million and $58 million in 2018 and 2017, respectively.

(f) Consists primarily of insurance contracts and other investments to be utilized for non-qualified pension and OPEB obligations.

(g) Long-term receivables are not material and are largely reserved. The balances at December 31, 2018 and 2017 are net of reserves of $46 million and $51 million, respectively. The amounts in both periods relate primarily to long-term notes receivable from customers and government receivables in Brazil. Collectability is reviewed regularly and uncollectible amounts are written-off as appropriate.

(h) North America consists of currency translation adjustments in Canada and Mexico. South America relates primarily to Brazil and Argentina. Europe relates primarily to Spain, Russia and Germany. Asia relates primarily to China, India and Korea. Linde AG includes currency movements since the merger date and relates primarily to the Euro.

NOTE 10. PROPERTY, PLANT AND EQUIPMENT – NET

Significant classes of property, plant and equipment are as follows (2018 reflects the impact of the Linde AG merger on October 31, 2018 (see Notes 1 and 3) and the divestiture of Praxair's European industrial gases business on December 3, 2018 (see Notes 1, 3 and 4)):

(Millions of dollars) December 31,	Depreciable Lives (Yrs)	2018	2017
Production plants (primarily 15-year life) (a)	10-20	$ 24,726	$ 16,258
Storage tanks	15-20	4,061	2,620
Transportation equipment and other (b)	3-15	2,654	1,588
Cylinders	10-30	3,955	1,875
Buildings	25-40	3,083	1,202
Land and improvements (c)	0-20	1,162	589
Construction in progress		2,296	1,159
		41,937	25,291
Less: accumulated depreciation		(12,220)	(13,466)
		$ 29,717	$ 11,825

(a) - Depreciable lives of production plants related to long-term customer supply contracts are consistent with the contract lives.

(b) - Capitalized software was previously reported in the transportation equipment and other line. At December 31, 2018, capitalized software balances were reported within other intangibles - net (see Note 12). Prior period amounts have been reclassified to conform to current year presentation (see Note 2).

(c) - Land is not depreciated.

The gross amount of assets recorded under capital leases by major class are as follows:

(Millions of dollars) December 31,	2018	2017
Production plants	$ 1	$ 2
Transportation equipment and other	49	1
Buildings	24	—
	$ 74	$ 3

NOTE 11. GOODWILL

Changes in the carrying amount of goodwill for the years ended December 31, 2018 and 2017 were as follows (2018 reflects the impact of the Linde AG merger on October 31, 2018 (see Notes 1 and 3) and the divestiture of Praxair's European industrial gases business on December 3, 2018 (see Notes 1 and 4)):

(Millions of dollars)	North America	South America	Europe	Asia	Surface Technologies	Linde AG	Total
Balance, December 31, 2016	$ 2,165	$ 132	$ 629	$ 58	$ 133	$ —	$ 3,117
Acquisitions (Note 3)	24	—	—	—	—	—	24
Purchase adjustments & other	—	(1)	1	—	—	—	—
Foreign currency translation	13	(2)	68	3	10	—	92
Balance, December 31, 2017	$ 2,202	$ 129	$ 698	$ 61	$ 143	$ —	$ 3,233
Addition due to Merger (Note 3)	—	—	—	—	—	24,146	24,146
Acquisitions (Note 3)	5	—	—	—	—	—	5
Purchase adjustments & other	12	—	—	—	—	—	12
Foreign currency translation	(11)	(23)	(37)	—	(5)	174	98
Disposals (Note 4)	—	—	(620)	—	—	—	(620)
Balance, December 31, 2018	$ 2,208	$ 106	$ 41	$ 61	$ 138	$ 24,320	$ 26,874

Linde has performed its goodwill impairment tests annually during the second quarter of each year, and historically has determined that the fair value of each of its reporting units was substantially in excess of its carrying value. For the 2018 test, Linde applied the FASB's accounting guidance which allows the company to first assess qualitative factors to determine the extent of additional quantitative analysis, if any, that may be required to test goodwill for impairment. Based on the qualitative assessments performed, Linde concluded that it was more likely than not that the fair value of each reporting unit substantially exceeded its carrying value and therefore, further quantitative analysis was not required. As a result, no impairment was recorded. There were no indicators of impairment through December 31, 2018.

NOTE 12. OTHER INTANGIBLE ASSETS

The following is a summary of Linde's other intangible assets at December 31, 2018 and 2017 (2018 reflects the impact of the Linde AG merger on October 31, 2018 (see Notes 1 and 3) and the divestiture of Praxair's European industrial gases business on December 3, 2018 (see Notes 1 and 4)):

(Millions of dollars) For the year ended December 31, 2018	Customer Relationships	Brands/ Tradenames	Other Intangible Assets	Total
Cost:				
Balance, December 31, 2017	$ 772	$ 46	$ 619	$ 1,437
Additions due to merger (Note 3)	12,555	2,226	811	15,592
Additions (primarily acquisitions)	1	—	26	27
Foreign currency translation	121	24	(9)	136
Disposals (Note 4)	(141)	(8)	(78)	(227)
Other *	(20)	—	(3)	(23)
Balance, December 31, 2018	13,288	2,288	1,366	16,942
Less: accumulated amortization:				
Balance, December 31, 2017	(260)	(18)	(374)	(652)
Amortization expense (Note 9)	(135)	(9)	(71)	(215)
Foreign currency translation	4	—	8	12
Disposals (Note 4)	55	5	52	112
Other *	19	—	5	24
Balance, December 31, 2018	(317)	(22)	(380)	(719)
Net intangible asset balance at December 31, 2018	$ 12,971	$ 2,266	$ 986	$ 16,223

(Millions of dollars) For the year ended December 31, 2017	Customer Relationships	Brands/ Tradenames	Other Intangible Assets	Total
Cost:				
Balance, December 31, 2016	$ 751	$ 45	$ 586	$ 1,382
Additions (primarily acquisitions)	1		40	41
Foreign currency translation	22	1	10	33
Other *	(2)		(17)	(19)
Balance, December 31, 2017	772	46	619	1,437
Less: accumulated amortization:				
Balance, December 31, 2016	(214)	(15)	(342)	(571)
Amortization expense (Note 9)	(40)	(3)	(48)	(91)
Foreign currency translation	(8)		(6)	(14)
Other *	2		22	24
Balance, December 31, 2017	(260)	(18)	(374)	(652)
Net balance at December 31, 2017	$ 512	$ 28	$ 245	$ 785

* Other primarily relates to the write-off of fully amortized assets, purchase accounting adjustments and reclassifications.

There are no expected residual values related to these intangible assets. Amortization expense for the years ended December 31, 2018, 2017 and 2016 was $215 million, $91 million and $94 million, respectively. The remaining weighted-average amortization period for intangible assets is approximately 26 years.

Total estimated annual amortization expense related to finite lived intangibles is as follows:

(Millions of dollars)		
2019	$	848
2020		830
2021		790
2022		648
2023		605
Thereafter		10,833
Total amortization related to finite-lived intangible assets		14,554
Indefinite-lived intangible assets at December 31, 2018		1,669
Net intangible assets at December 31, 2018	$	16,223

NOTE 13. DEBT

The following is a summary of Linde's outstanding debt at December 31, 2018 and 2017 (2018 reflects the impact of the Linde AG merger on October 31, 2018 (see Notes 1 and 3)).

(Millions of dollars)	2018	2017
Short-term		
Commercial paper and U.S. bank borrowings	$ 829	$ 202
Other bank borrowings (primarily international)	656	36
Total short-term debt	1,485	238
Long-term (a)		
1.20% Notes due 2018 (b)	—	498
1.25% Notes due 2018 (c)	—	475
1.90% Notes due 2019 (f)	500	500
Variable rate notes due 2019	150	—
1.75% Euro denominated notes due 2019 (e)	578	—
4.25% AUD denominated notes due 2019	71	—
4.50% Notes due 2019 (d)	—	599
Variable rate notes due 2019	200	—
1.50% Euro denominated notes due 2020 (d)	—	717
2.25% Notes due 2020	299	299
1.75% Euro denominated notes due 2020 (e)	1,185	—
0.634% Euro denominated notes due 2020	58	—
4.05% Notes due 2021	499	498
3.875% Euro denominated notes due 2021 (e)	755	—
3.00% Notes due 2021	498	497
0.250% Euro denominated notes due 2022 (e)	1,156	—
2.45% Notes due 2022	598	598
2.20% Notes due 2022	498	498
2.70% Notes due 2023	498	498
2.00% Euro denominated notes due 2023 (e)	805	—
5.875% GBP denominated notes due 2023 (e)	454	—
1.20% Euro denominated notes due 2024	628	658
1.875% Euro denominated notes due 2024 (e)	373	—
2.65% Notes due 2025	398	397
1.625% Euro denominated notes due 2025	568	594
3.20% Notes due 2026	725	725
3.434% Notes due 2026	195	—
1.652% Euro denominated notes due 2027	96	—
1.00% Euro denominated notes due 2028 (e)	861	—
1.90% Euro denominated notes due 2030	121	—
3.55% Notes due 2042	662	662
Other	10	12
International bank borrowings	291	33
Obligations under capital lease	81	4
	13,811	8,762
Less: current portion of long-term debt	(1,523)	(979)
Total long-term debt	12,288	7,783
Total debt	$ 15,296	$ 9,000

(a) Amounts are net of unamortized discounts, premiums and/or debt issuance costs as applicable.

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(b) In March 2018, Linde repaid $500 million of 1.20% notes that became due.

(c) In November 2018, Linde repaid $475 million of 1.25% notes that became due and the associated interest rate swap was settled. See Note 14 for additional information regarding interest rate swaps.

(d) In December 2018, Linde repaid $600 million of 4.50% notes due 2019 and €600 million of 1.50% notes due 2020 resulting in a $26 million interest charge ($20 million after-tax, or $0.06 per diluted share). Also during December Linde repaid €750 million of 3.125% notes acquired in the merger that became due in December 2018.

(e) The fair value decrease in debt related to hedge accounting for the year ended December 31, 2018 was $14 million; the impact in 2017 was not significant. See Note 14 for additional information.

(f) In February 2019, Linde repaid $500 million of 1.90% notes that became due.

Credit Facilities

At December 31, 2018, the company has the following major credit facilities available for future borrowing:

Millions of dollars	Total Facility	Borrowings Outstanding	Available for Borrowing	Expires
Praxair Senior Unsecured	$ 2,500	$ —	$ 2,500	Dec-19
Linde AG Revolving Credit Facility	€ 2,500	$ —	€ 2,500	Jul-20

In June 2017, Praxair entered into a $500 million 364-day revolving credit facility with a syndicate of banks which expired in June 2018 and was not renewed.

The $2.5 billion and €2.5 billion credit facilities are with major financial institutions and are non-cancelable by the issuing financial institutions until their respective maturities. There are no financial covenants contained in the agreement relating to the Linde AG €2.5 billion credit facility; the only financial covenant for the senior unsecured $2.5 billion credit facility requires the company not to exceed a maximum 70% leverage ratio. No borrowings were outstanding under the credit agreements as of December 31, 2018.

Covenants

Linde's $2.5 billion senior unsecured credit facility and long-term debt agreements contain various covenants which may, among other things, restrict certain types of mergers and changes in beneficial ownership of the company, and the ability of the company to incur or guarantee debt, sell or transfer certain assets, create liens against assets, enter into sale and leaseback agreements, or pay dividends and make other distributions beyond certain limits. These agreements also require Linde to not exceed a maximum 70% leverage ratio defined in the agreements as the ratio of consolidated total debt to the sum of consolidated total debt plus consolidated shareholders' equity of the company. For purposes of the leverage ratio calculation, consolidated shareholders' equity excludes changes in the cumulative foreign currency translation adjustments after June 30, 2011. At December 31, 2018, the actual leverage ratio, as calculated according to the agreement, was 34% and the company is in compliance with all financial covenants. Also, there are no material adverse change clauses or other subjective conditions that would restrict the company's ability to borrow under the agreement.

Other Debt Information

As of December 31, 2018 and 2017, the weighted-average interest rate of short-term borrowings outstanding was 0.6% and 2.1%, respectively. The decrease in the rate year-over-year is related primarily to significant European commercial paper balances at negative interest rates, which offsets the impact of higher rates on other bank borrowings.

Expected maturities of long-term debt are as follows:

(Millions of dollars)	
2019	$ 1,523
2020	1,642
2021	1,864
2022	2,336

2023	1,788
Thereafter	4,658
	$ 13,811

As of December 31, 2018, $74 million of Linde's assets were pledged as collateral for $81 million of long-term debt, including the current portion of long-term debt. The carrying amounts of assets pledged as collateral for long-term debt are disclosed primarily under property, plant, and equipment and are included within buildings and transportation equipment and other.

In February 2016, Linde redeemed $325 million of 5.20% notes due March 2017 resulting in a $16 million interest charge ($10 million after-tax, or $0.04 per diluted share).

See Note 15 for the fair value information related to debt.

NOTE 14. FINANCIAL INSTRUMENTS

In its normal operations, Linde is exposed to market risks relating to fluctuations in interest rates, foreign currency exchange rates, energy costs and to a lesser extent precious metal prices. The objective of financial risk management at Linde is to minimize the negative impact of such fluctuations on the company's earnings and cash flows. To manage these risks, among other strategies, Linde routinely enters into various derivative financial instruments ("derivatives") including interest-rate swap and treasury rate lock agreements, currency-swap agreements, forward contracts, currency options, and commodity-swap agreements. These instruments are not entered into for trading purposes and Linde only uses commonly traded and non-leveraged instruments.

There are three types of derivatives that the company enters into: (i) those relating to fair-value exposures, (ii) those relating to cash-flow exposures, and (iii) those relating to foreign currency net investment exposures. Fair-value exposures relate to changes in the fair value of recognized assets or liabilities, primarily financial assets and financial liabilities, and firm commitments. Cash-flow exposures relate to the variability of future cash flows associated with recognized assets or liabilities, or forecasted transactions for which no underlying exposure is yet reported in the consolidated balance sheet. Net investment exposures relate to the impact of foreign currency exchange rate changes on the carrying value of net assets denominated in foreign currencies.

When a derivative is executed and hedge accounting is appropriate, it is designated as either a fair-value hedge, cash-flow hedge, or a net investment hedge. Currently, Linde designates the majority of interest-rate and treasury-rate locks as hedges for accounting purposes; however, currency contracts are generally not designated as hedges for accounting purposes unless they are related to forecasted transactions. Whether designated as hedges for accounting purposes or not, all derivatives are linked to an appropriate underlying exposure. On an ongoing basis, the company assesses the hedge effectiveness of all derivatives designated as hedges for accounting purposes to determine if they continue to be highly effective in offsetting changes in fair values or cash flows of the underlying hedged items. If it is determined that the hedge is not highly effective, then hedge accounting will be discontinued prospectively.

Counterparties to Linde's derivatives are major banking institutions with credit ratings of investment grade or better. As of year-end, Linde AG had existing Credit Support Annexes ("CSAs") in place with their principal counterparties to minimize potential default risk and to mitigate counterparty risk. Under the CSAs, the fair values of derivatives for the purpose of interest rate and currency management are collateralized with cash on a regular basis. As of December 31, 2018, the impact of such collateral posting arrangements on the fair value of derivatives was insignificant. Management believes the risk of incurring losses on derivative contracts related to credit risk is remote and any resulting losses would be immaterial.

The following table is a summary of the notional amount and gross fair values of derivatives outstanding at December 31, 2018 and 2017 for consolidated subsidiaries:

(Millions of dollars) December 31,	Notional Amounts 2018	Notional Amounts 2017	Fair Value Assets (a) 2018	Fair Value Assets (a) 2017	Fair Value Liabilities (a) 2018	Fair Value Liabilities (a) 2017
Derivatives Not Designated as Hedging Instruments:						
Currency contracts:						
Balance sheet items	$ 6,357	$ 2,693	$ 24	$ 16	$ 42	$ 16
Forecasted transactions	945	—	15	—	17	—
Interest rate/Cross-currency interest rate swaps	2,110	—	112	—	40	—
Commodity contracts	—	—	27	—	9	—
Derivatives Designated as Hedging Instruments:						
Currency contracts:						
Balance sheet items	$ —	$ 38	$ —	$ —	$ —	$ 2
Forecasted transactions	158	4	2	1	3	—
Interest rate contracts:						
Interest rate swaps	2,164	475	13	—	10	—
Total Hedges	$ 2,322	$ 517	$ 15	$ 1	$ 13	$ 2
Total Derivatives	$ 11,734	$ 3,210	$ 193	$ 17	$ 121	$ 18

(a) Current assets of $67 million are recorded in prepaid and other current assets; long-term assets of $126 million are recorded in other long-term assets; current liabilities of $78 million are recorded in other current liabilities; and long-term liabilities of $43 million are recorded in other long-term liabilities.

Balance Sheet Items

Foreign currency contracts related to balance sheet items consist of forward contracts entered into to manage the exposure to fluctuations in foreign-currency exchange rates on recorded balance sheet assets and liabilities denominated in currencies other than the functional currency of the related operating unit. Certain forward currency contracts are entered into to protect underlying monetary assets and liabilities denominated in foreign currencies from foreign exchange risk and are not designated as hedging instruments. For balance sheet items that are not designated as hedging instruments, the fair value adjustments on these contracts are offset by the fair value adjustments recorded on the underlying monetary assets and liabilities.

Linde also enters into forward currency contracts, which are designated as hedging instruments, to limit the cash flow exposure on certain foreign-currency denominated intercompany loans. The fair value adjustments on these contracts are recorded to AOCI, with the effective portion immediately reclassified to earnings to offset the fair value adjustments on the underlying debt instrument.

Forecasted Transactions

Foreign currency contracts related to forecasted transactions consist of forward contracts entered into to manage the exposure to fluctuations in foreign-currency exchange rates on (1) forecasted purchases of capital-related equipment and services, (2) forecasted sales, or (3) other forecasted cash flows denominated in currencies other than the functional currency of the related operating units. For forecasted transactions that are designated as cash flow hedges, fair value adjustments are recorded to AOCI with deferred amounts reclassified to earnings over the same time period as the income statement impact of the associated purchase. For forecasted transactions that do not qualify for cash flow hedging relationships, fair value adjustments are recorded directly to earnings.

Interest Rate/Cross-Currency Interest Rate Swaps

Cross-currency interest rate swaps are entered into to limit the foreign currency risk of future principal and interest cash flows associated with intercompany loans, and to a more limited extent bonds, denominated in non-functional currencies. The fair value adjustments on the cross-currency swaps are recorded to earnings, where they are offset by fair value adjustments on the underlying intercompany loan or bond.

Commodity Contracts

Commodity contracts are entered into to manage the exposure to fluctuations in commodity prices, which arise in the normal course of business from its procurement transactions. To reduce the extent of this risk, Linde enters into a limited number of electricity, natural gas, and propane gas derivatives. As of December 31, 2018 these commodity contracts were not designated as cash flow hedges. Therefore, the fair value adjustments on these contracts are recorded to earnings and are eventually offset by the income statement impact of the underlying commodity purchase.

Net investment hedges

In 2014, Praxair designated the €600 million 1.50% Euro-denominated notes due 2020 and the €500 million ($568 million as of December 31, 2018) 1.625% Euro-denominated notes due 2025, as a hedge of the net investment position in its European operations. In 2016, Praxair designated an incremental €550 million ($628 million as of December 31, 2018) 1.20% Euro-denominated notes due 2024 as an additional hedge of the net investment position in its European operations.

On October 31, 2018 Praxair and Linde AG combined their respective businesses through an all-stock transaction and became subsidiaries of the company. In December 2018, as a condition of the merger, Praxair completed the sale of the majority of its European operations to Taiyo Nippon Sanso Corporation. This significantly reduced the net investment position in Praxair's European operations. During the same month Praxair also repaid the €600 million 1.50% Euro-denominated notes due 2020, which significantly reduced the debt balance designated as a hedge. In response to the above transactions, Praxair de-designated €965 million of its Euro-denominated notes. At December 31, 2017 Praxair had de-designated €200 million of its Euro-denominated notes in response to the U.S. government-enacted Tax Cuts and Jobs Act and associated decrease in the tax rate.

These Euro-denominated debt instruments reduce the company's exposure to changes in the currency exchange rate on investments in foreign subsidiaries with Euro functional currencies. Since hedge inception, exchange rate movements have reduced long-term debt by $202 million (long-term debt decreased by $105 million during the year ended December 31, 2018), with the offsetting gain shown within the cumulative translation component of AOCI in the consolidated balance sheets and the consolidated statements of comprehensive income.

Interest Rate Swaps

Linde uses interest rate swaps to hedge the exposure to changes in the fair value of financial assets and financial liabilities as a result of interest rate changes. These interest rate swaps effectively convert fixed-rate interest exposures to variable rates; fair value adjustments are recognized in earnings along with an equally offsetting charge/benefit to earnings for the changes in the fair value of the underlying financial asset or financial liability. The following table summarizes the outstanding interest rate swaps for Linde as of December 31, 2018:

	2018		2017	
(Millions of dollars)	**US$ Derivative Notional**	**Change in Fair Value (b)**	**US$ Derivative Notional**	**Change in Fair Value**
Underlying debt instrument:				
1.00% Euro denominated notes due 2028	$ 516	$ 8	$ —	$ —
1.25% Notes due 2018 (a)	—	—	475	—
0.250% Euro denominated notes due 2022	344	2	—	—
2.00% Euro denominated notes due 2023	287	2	—	—
3.875% Euro denominated notes due 2021	287	1	—	—
5.875% GBP denominated notes due 2023	254	1	—	—
1.75% Euro denominated notes due 2019	229	(1)	—	—
1.75% Euro denominated notes due 2020	132	—	—	—
1.875% Euro denominated notes due 2024	115	1	—	—
	$ 2,164	**$ 14**	**$ 475**	**$ —**

(a) At December 31, 2017, Praxair had one outstanding interest rate swap agreement with a $475 million notional amount related to the $475 million 1.25% notes maturing in November 2018. The increase in the fair value of this note was less than $1 million. In November 2018 the notes were repaid and the associated fixed-to-variable interest rate swap was settled.

(b) In connection with the merger, Linde AG's assets and liabilities were measured at estimated fair value as of October 31, 2018.

Terminated Treasury Rate Locks

The following table summarizes the unrecognized gains (losses) related to terminated treasury rate lock contracts:

(Millions of dollars)	Year Terminated	Original Gain / (Loss)	Unrecognized Gain / (Loss) (a) 12/31/2018	Unrecognized Gain / (Loss) (a) 12/31/2017
Treasury Rate Locks				
Underlying debt instrument:				
$500 million 2.20% fixed-rate notes that mature in 2022 (b)	2012	$ (2)	$ —	$ (1)
$500 million 3.00% fixed-rate notes that mature in 2021 (b)	2011	(11)	(3)	(4)
$600 million 4.50% fixed-rate notes that mature in 2019 (b,c)	2009	16	—	3
Total – pre-tax			$ (3)	$ (2)
Less: income taxes			1	1
After- tax amounts			$ (2)	$ (1)

(a) The unrecognized gains / (losses) for the treasury rate locks are shown in accumulated other comprehensive income ("AOCI") and are being recognized on a straight line basis to interest expense – net over the term of the underlying debt agreements. Refer to the table below summarizing the impact of the company's consolidated statements of income and AOCI for current period gain (loss) recognition.

(b) The notional amount of the treasury rate lock contracts are equal to the underlying debt instrument with the exception of the treasury rate lock contract entered into to hedge the $600 million 4.50% fixed-rate notes that mature in 2019. The notional amount of this contract was $500 million.

(c) In December 2018, Linde repaid $600 million of 4.50% notes that mature in 2019. The unrecognized gain on the associated treasury rate lock was reclassified from other comprehensive income to interest expense.

Impact of derivative instruments on earnings and AOCI

The following table summarizes the impact of the company's derivatives not designated as hedging instruments on the consolidated statements of income:

(Millions of dollars) December 31,	Amount of Pre-Tax Gain (Loss) Recognized in Earnings * 2018	2017	2016
Derivatives Not Designated as Hedging Instruments			
Currency contracts:			
Balance sheet items:			
Debt-related	$ (118)	$ 121	$ 21
Other balance sheet items	3	—	4
Total	$ (115)	$ 121	$ 25

* The gains (losses) on balance sheet items are offset by gains (losses) recorded on the underlying hedged assets and liabilities. Accordingly, the gains (losses) for the derivatives and the underlying hedged assets and liabilities related to debt items are recorded in the consolidated statements of income as interest expense-net. The gains (losses) on other balance sheet items are recorded in the consolidated statements of income as other income (expenses)-net.

The following table summarizes the impact of the company's derivatives designated as hedging instruments that impact AOCI:

(Millions of dollars)	Amount of Gain (Loss) Recognized in AOCI			Amount of Gain (Loss) Reclassified from AOCI to the Consolidated Statement of Income		
December 31,	2018	2017	2016	2018	2017	2016
Derivatives Designated as Hedging Instruments**						
Currency contracts:						
Net investment hedge	$ —	$ —	$ (4)	$ —	$ —	$ —
Forecasted transactions	—	1	—	—	—	—
Balance sheet items	—	(1)	1	—	—	—
Interest rate contracts:						
Treasury rate locks	—	—	—	(1)	—	(1)
Total – Pre tax	$ —	$ —	$ (3)	$ (1)	$ —	$ (1)
Less: income taxes	—	—	—	—	—	1
Total - Net of Taxes	$ —	$ —	$ (3)	$ (1)	$ —	$ —

** The gains (losses) on net investment hedges are recorded as a component of AOCI within foreign currency translation adjustments in the consolidated balance sheets and consolidated statements of comprehensive income. The gains (losses) on forecasted purchases, balance sheet items, and treasury rate locks are recorded as a component of AOCI within derivative instruments in the consolidated balance sheets and the consolidated statements of comprehensive income. There was no ineffectiveness for these instruments during 2018 or 2017. The gains (losses) on net investment hedges are reclassified to earnings only when the related currency translation adjustments are required to be reclassified, usually upon sale or liquidation of the investment. The gains (losses) for interest rate contracts are reclassified to earnings as interest expense –net on a straight-line basis over the remaining maturity of the underlying debt. Net losses of less than $1 million are expected to be reclassified to earnings during 2019.

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NOTE 15. FAIR VALUE DISCLOSURES

The fair value hierarchy prioritizes the inputs to valuation techniques used to measure fair value into three broad levels as follows:

Level 1 – quoted prices in active markets for identical assets or liabilities
Level 2 – quoted prices for similar assets and liabilities in active markets or inputs that are observable
Level 3 – inputs that are unobservable (for example cash flow modeling inputs based on assumptions)

Assets and Liabilities Measured at Fair Value on a Recurring Basis

The following table summarizes assets and liabilities measured at fair value on a recurring basis at December 31, 2018 and 2017:

	Fair Value Measurements Using					
(Millions of dollars)	Level 1		Level 2		Level 3	
	2018	2017	2018	2017	2018	2017
Assets						
Derivative assets	$ —	$ —	$ 193	$ 17	$ —	$ —
Investments and securities *	22	—	—	—	30	—
Total	$ 22	$ —	$ 193	$ 17	$ 30	$ —
Liabilities						
Derivative liabilities	$ —	$ —	$ 121	$ 18	$ —	$ —

* Investments and securities are recorded in prepaid and other current assets in the company's consolidated balance sheets.

The fair values of the derivative assets and liabilities are based on market prices obtained from independent brokers or determined using quantitative models that use as their basis readily observable market parameters that are actively quoted and can be validated through external sources, including third-party pricing services, brokers and market transactions. Level 1 investments and securities are marketable securities traded on an exchange. Level 3 investments and securities consist of a venture fund. For the valuation, Linde uses the net asset value received as part of the fund's quarterly reporting, which for the most part is not based on quoted prices in active markets. In order to reflect current market conditions, Linde proportionally adjusts these by observable market data (stock exchange prices) or current transaction prices.

The following table summarizes the changes in level 3 investments and securities for the years ended December 31, 2018 and December 31, 2017. Gains (losses) recognized in earnings are recorded to interest expense - net in the company's consolidated statements of income.

(Millions of dollars)	2018
Balance at January 1	$ —
Merger impact	28
Gains (losses) recognized in earnings	2
Balance at December 31	$ 30

The fair value of cash and cash equivalents, short-term debt, accounts receivables-net, and accounts payable approximate carrying value because of the short-term maturities of these instruments.

The fair value of long-term debt is estimated based on the quoted market prices for the same or similar issues. Long-term debt is categorized within either Level 1 or Level 2 of the fair value hierarchy depending on the trading volume of the issues and whether or not they are actively quoted in the market as opposed to traded through over-the-counter transactions. Linde AG's long-term debt is primarily categorized within Level 1 measurements as the majority of the Linde AG bond portfolio is publicly traded. At December 31, 2018, the estimated fair value of Linde’s long-term debt portfolio was $13,725 million versus a carrying value of $13,811 million. As Linde AG's assets and liabilities were measured at estimated fair value as of the merger date, differences between the carrying value and the fair value are insignificant; remaining differences are attributable to interest rate increases subsequent to when the debt was issued and relative to stated coupon rates. At December 31, 2017, the estimated fair value of Linde's long-term debt portfolio was $8,969 million versus a carrying value of $8,762 million.

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NOTE 16. EQUITY AND NONCONTROLLING INTERESTS

Linde plc Shareholders' Equity

At December 31, 2018, Linde has total authorized share capital of €1,825,000 divided into 1,750,000,000 ordinary shares of €0.001 each, 25,000 A ordinary shares of €1.00 each, 25,000 deferred shares of €1.00 each and 25,000,000 preferred shares of €0.001 each.

At December 31, 2018 there were 551,310,272 and 547,241,630 of Linde plc ordinary shares issued and outstanding, respectively. At December 31, 2018 there were no shares of A ordinary shares, deferred shares or preferred shares issued or outstanding.

At December 31, 2017 there were 800,000,000 shares of Praxair common stock authorized (par value $0.01 per share) of which shares 383,230,625 were issued and 286,776,991 were outstanding at December 31, 2017. At December 31, 2017, there were 25,000,000 shares of Praxair preferred stock (par value $0.01 per share) authorized, of which no shares were issued and outstanding.

Linde's Board of Directors may from time to time authorize the issuance of one or more series of preferred stock and, in connection with the creation of such series, determine the characteristics of each such series including, without limitation, the preference and relative, participating, optional or other special rights, and the qualifications, limitations or restrictions of the series.

Merger of Praxair and Linde AG

Following is a summary of the Linde plc shareholders' equity transactions related to the merger:

	Ordinary Shares		Additional Paid in Capital	Treasury Stock	
(Dollar amounts in millions, shares in thousands)	Shares	Amount		Shares	Amount
Merger with Linde AG (a)	263,148	$ —	$ 43,288	—	$ —
Conversion of Praxair to Linde plc shares (b)	—	(3)	3	—	—
Cancellation of Praxair Treasury stock (c)	(95,324)	—	(7,113)	(95,324)	7,113
Impact of Linde AG merger	167,824	$ (3)	$ 36,178	(95,324)	$ 7,113

(a) The total fair value of consideration transferred for the merger was $43,288 million, resulting in an increase to "Additional paid-in capital" in stockholders' equity (see Note 3 for additional information).
(b) On October 31, 2018, the conversion of Praxair common stock and Linde AG common stock into Linde ordinary shares resulted in a $3 million decrease to "Ordinary Shares" with a corresponding increase to "Additional paid-in capital" in stockholders' equity.
(c) Each share of Praxair common stock held in treasury immediately prior to the merger was canceled. The elimination of Praxair's historical treasury stock at cost resulted in a $7,113 million decrease in "Treasury stock" and "Additional paid-in capital" in stockholders' equity.

As indicated above, in connection with the merger, Praxair and Linde AG common stock was converted into shares of Linde plc ordinary shares. The following table provides a summary of the share activity resulting from the merger:

(in thousands, except Linde AG exchange ratio)

Linde plc shares exchanged for Linde AG shares	
Linde AG common stock tendered as of October 31, 2018 (i)	170,875
Business combination agreement exchange ratio (ii)	1.54
	263,148

Linde plc ordinary shares issued in exchange for Linde AG	
Linde plc shares issued to Praxair shareholders upon conversion	
Praxair shares outstanding at merger date	287,907
Total Linde plc shares issued at merger date	**551,055**

(i) Number of Linde AG shares tendered in the 2017 Exchange Offer.
(ii) Exchange ratio for Linde AG shares as set forth in the business combination agreement.

Other Linde plc Ordinary Share and Treasury Stock Transactions

Linde may issue new ordinary shares shares for dividend reinvestment and stock purchase plans and employee savings and incentive plans. The number of new Linde ordinary shares shares issued from merger date through December 31, 2018 was approximately 255 thousand shares. Prior to the merger, Praxair issued shares related to such activity out of treasury stock.

On December 10, 2018 the Linde board of directors approved the repurchase of $1.0 billion of its common stock under which Linde had repurchased 4,068,642 shares through December 31, 2018. Subsequently, on January 22, 2019 the company's board of directors approved the additional repurchase of $6.0 billion of its common stock.

Noncontrolling Interests

Noncontrolling interest ownership changes are presented within the consolidated statements of equity. The $186 million decrease during 2018 primarily relates to the sale of Praxair's industrial gases business in Europe (see Notes 1 and 4). The "Impact of Merger" line item of the consolidated statements of equity includes the fair value of the noncontrolling interests acquired from Linde AG, including the 8% of Linde AG shares which were not tendered in the Exchange Offer and are intended to be the subject of a cash-merger squeeze-out. See Note 3.

The $15 million increase during 2017 relates to additional funding provided to PG Technologies, LLC ("PGT") by the joint venture partner.

The $20 million increase during 2016 relates to the sale of an ownership interest in a majority-owned joint venture in India during the third quarter offset by the formation of PGT, a majority-owned joint venture with GE Aviation. The 2016 "Additions (Reductions)" line item of the consolidated statements of equity also includes an increase to Additional Paid-In Capital resulting from the sale of the noncontrolling interest to the PGT joint venture partner.

Redeemable Noncontrolling Interests

Noncontrolling interests with redemption features, such as put/sell options, that are not solely within the company's control ("redeemable noncontrolling interests") are reported separately in the consolidated balance sheets at the greater of carrying value or redemption value. For redeemable noncontrolling interests that are not yet exercisable, Linde calculates the redemption value by accreting the carrying value to the redemption value over the period until exercisable. If the redemption value is greater than the carrying value, any increase is adjusted directly to retained earnings and does not impact net income. At December 31, 2018, the redeemable noncontrolling interest balance includes one packaged gas distributor in the United States where the noncontrolling shareholder has a put option.

The following is a summary of redeemable noncontrolling interests for the years ended December 31, 2018, 2017 and 2016:

(Millions of dollars)	2018	2017	2016
Beginning Balance	$ 11	$ 11	$ 113
Net income	3	2	3
Distributions to noncontrolling interest	(1)	(3)	(2)
Redemption value adjustment/accretion	3	1	(6)
Foreign currency translation and other	—	—	7
Purchase/divestiture of noncontrolling interest *	—	—	(104)
Ending Balance	$ 16	$ 11	$ 11

* In June 2016, Linde acquired the remaining 34% stake in a Scandinavian joint venture for $104 million. The cash payment related to this acquisition is shown in the financing section of the consolidated statements of cash flows under the caption "Noncontrolling interest transactions and other" as there was no change in control.

NOTE 17. SHARE-BASED COMPENSATION

Share-based compensation expense was $62 million in 2018 ($59 million and $39 million in 2017 and 2016, respectively). The related income tax benefit recognized was $30 million in 2018 ($53 million and $32 million in 2017 and 2016, respectively). The expense was primarily recorded in selling, general and administrative expenses and no share-based compensation expense was capitalized.

Summary of Plans

The 2009 Praxair, Inc. Long-Term Incentive Plan was initially adopted by the board of directors and shareholders of Praxair, Inc. on April 28, 2009 and has been amended since its initial adoption ("the 2009 Plan"). Upon completion of the business combination of Praxair, Inc. with Linde AG on October 31, 2018, the 2009 Plan was assumed by the company. Prior to April 28, 2009, Praxair, Inc. granted equity awards under the 2002 Praxair, Inc. Long-Term Incentive Plan , (“the 2002 Plan”) which was also assumed by the company upon completion of the business combination. The 2009 Plan permits awards of stock options, stock appreciation rights, restricted stock and restricted stock units, performance-based stock units and other equity awards to eligible officer and non-officer employees and non-employee directors of the company and its affiliates. As of December 31, 2018, 8,009,603 shares remained available for equity grants under the 2009 Plan, of which 2,600,000 shares may be granted as awards other than options or stock appreciation rights.

In 2005, the board of directors and shareholders of Praxair, Inc. adopted the 2005 Equity Compensation Plan for Non-Employee Directors of Praxair, Inc. ("the 2005 Plan"). Upon completion of the business combination in October 2018, the 2005 Plan was also assumed by the company. Under the 2005 Plan, the aggregate number of shares available for option and other equity grants was limited to a total of 500,000 shares. The 2005 Plan expired on April 30, 2010, by its own terms, and no shares were available for grant thereafter.

Upon the completion of the business combination, all options outstanding under the 2009 Plan, the 2002 Plan and the 2005 Plan were converted into options to acquire the same number of shares of the company and at the same exercise price per share that applied prior to the business combination.

Exercise prices for options granted under the 2009 Plan may not be less than the closing market price of the company’s ordinary shares on the date of grant and granted options may not be re-priced or exchanged without shareholder approval. Options granted under the 2009 Plan subject only to time vesting requirements may become partially exercisable after a minimum of one year after the date of grant but may not become fully exercisable until at least three years have elapsed from the date of grant, and all options have a maximum duration of ten years. Options granted under predecessor plans had similar terms.

In connection with the business combination, on October 31, 2018 the company's Board of Directors adopted the Long Term Incentive Plan of Linde plc (“the LTIP 2018”), the purpose of which is to replace certain outstanding Linde AG equity based awards that were terminated. Under the LTIP 2018, the aggregate number of shares available for replacement option rights and replacement restricted share units was set at 473,128. As of December 31, 2018, all shares remained available for grant, as the Company is not obligated to make these replacement awards until 2019.

Exercise prices for the replacement option rights to be granted in 2019 under the LTIP 2018 will be equal to EUR 1.67 as prescribed in the business combination agreement. Each replacement option right granted under the LTIP 2018 will be subject to vesting based on continued service until the end of the four-year waiting period applicable to the relevant Linde AG award that had been granted before the business combination. After vesting, each option right will be exercisable for one year.

In order to satisfy option exercises and other equity grants, the Company may issue authorized but previously unissued shares or it may issue treasury shares.

Stock Option Fair Value

The company utilizes the Black-Scholes Options-Pricing Model to determine the fair value of stock options consistent with that used in prior years. Management is required to make certain assumptions with respect to selected model inputs, including anticipated changes in the underlying stock price (i.e., expected volatility) and option exercise activity (i.e., expected life). Expected volatility is based on the historical volatility of the company’s stock over the most recent period commensurate with the estimated expected life of the company’s stock options and other factors. The expected life of options granted, which represents the period of time that the options are expected to be outstanding, is based primarily on historical exercise experience. The expected dividend yield is based on the company’s most recent history and expectation of dividend payouts. The risk-free rate is based on the U.S. Treasury yield curve in effect at the time of grant for a period commensurate with the estimated expected life. If factors change and result in different assumptions in future periods, the stock option expense that the company records for future grants may differ significantly from what the company has recorded in the current period.

The weighted-average fair value of options granted during 2018 was $19.29 ($12.40 in 2017 and $8.91 in 2016) based on the Black-Scholes Options-Pricing model. The increase in grant date fair value year-over-year is primarily attributable to an increase in the company's stock price.

The following weighted-average assumptions were used to value the grants in 2018, 2017 and 2016:

Year Ended December 31,	2018	2017	2016
Dividend yield	2.1%	2.7%	2.9%
Volatility	14.4%	14.0%	14.4%
Risk-free interest rate	2.67%	2.13%	1.41%
Expected term years	5	6	6

The following table summarizes option activity under the plans as of December 31, 2018 and changes during the period then ended (averages are calculated on a weighted basis; life in years; intrinsic value expressed in millions):

Activity	Number of Options (000's)	Average Exercise Price	Average Remaining Life	Aggregate Intrinsic Value
Outstanding at January 1, 2018	10,787	$ 108.70		
Granted	1,625	154.00		
Exercised	(1,714)	95.25		
Cancelled or expired	(74)	131.91		
Outstanding at December 31, 2018	10,624	$ 117.65	5.9	$ 408
Exercisable at December 31, 2018	7,065	$ 111.16	4.7	$ 317

The aggregate intrinsic value represents the difference between the company's closing stock price of $156.04 as of December 31, 2018 and the exercise price multiplied by the number of in the money options outstanding as of that date. The total intrinsic value of stock options exercised during 2018 was $113 million ($137 million and $82 million in 2017 and 2016, respectively).

Cash received from option exercises under all share-based payment arrangements for 2018 was $66 million ($107 million and $128 million in 2017 and 2016, respectively). The cash tax benefit realized from share-based compensation totaled $30 million for 2018 ($51 million and $32 million cash tax benefit in 2017 and 2016, respectively).

As of December 31, 2018, $19 million of unrecognized compensation cost related to non-vested stock options is expected to be recognized over a weighted-average period of approximately 1 year.

Performance-Based and Restricted Stock Awards

No performance-based stock awards were granted in 2018 as restricted stock units were granted in place of performance-based stock awards. In years prior to 2018, the company granted performance-based stock awards under the 2009 Plan to senior management that vest, subject to the attainment of pre-established minimum performance criteria, principally on the third anniversary of their date of grant. These awards were tied to either return on capital ("ROC") performance or relative total shareholder return ("TSR") performance versus that of the S&P 500. The actual number of shares issued in settlement of a vested award can range from zero to 200 percent of the target number of shares granted based upon the company's attainment of specified performance targets at the end of a three-year period. Compensation expense related to these awards is recognized over the three-year performance period based on the fair value of the closing market price of the company's ordinary shares on the date of the grant and the estimated performance that will be achieved. Compensation expense for ROC awards were adjusted during the three-year performance period based upon the estimated performance levels that will be achieved. TSR awards were measured at their grant date fair value and not subsequently re-measured.

The weighted-average fair value of ROC performance-based stock awards granting during 2017 and 2016 was $109.68 and $93.46, respectively. These fair values are based on the closing market price of Linde's ordinary shares on the grant date adjusted for dividends that will not be paid during the vesting period.

The weighted-average fair value of performance-based stock tied to relative TSR performance granted during 2017 was $124.12 ($124.18 in 2016), and was estimated using a Monte Carlo simulation performed as of the grant date.

Upon completion of the merger, each outstanding ROC and TSR performance-based award was converted into a Linde RSU based on performance achieved as of immediately prior to the closing of the merger, and became subject to service-vesting conditions only. This resulted in the conversion of 435,000 performance-based shares into 704,000 restricted stock units. Compensation expense related to these awards will continue to be recognized over the remainder of the respective three-year service period.

There were 278,907 restricted stock units granted to employees by Praxair during 2018. The weighted-average fair value of restricted stock units granted during 2018 was $144.86 ($111.95 in 2017 and $98.18 in 2016). These fair values are based on the closing market price of Linde's ordinary shares on the grant date adjusted for dividends that will not be paid during the vesting period. Compensation expense related to the restricted stock units is recognized over the vesting period. These awards were converted into equivalent Linde restricted stock units at the time of the business combination.

The following table summarizes non-vested performance-based and restricted stock award activity as of December 31, 2018 and changes during the period then ended (shares based on target amounts, averages are calculated on a weighted basis):

	Performance-Based		Restricted Stock	
	Number of Shares (000's)	Average Grant Date Fair Value	Number of Shares (000's)	Average Grant Date Fair Value
Non-vested at January 1, 2018	665	$ 113.40	264	$ 107.56
Granted	—	—	279	144.86
Vested	(79)	119.98	(153)	117.67
Award conversions	(435)	—	704	—
Cancelled and Forfeited	(151)	110.29	(23)	111.41
Non-vested at December 31, 2018	—	$ —	1,071	$ 118.84

There are approximately 12 thousand restricted stock shares that are non-vested at December 31, 2018 which will be settled in cash due to foreign regulatory limitations. The liability related to these grants reflects the current estimate of performance that will be achieved and the current ordinary shares price.

As of December 31, 2018, $30 million of unrecognized compensation cost related to the restricted stock awards is expected to be recognized primarily through the first quarter of 2021.

NOTE 18. RETIREMENT PROGRAMS

Defined Benefit Pension Plans - U.S.

Linde has two main U.S. retirement programs which are non-contributory defined benefit plans: the Linde Pension Plan and the CBI Pension Plan. The latter program benefits primarily former employees of CBI Industries, Inc. which Linde acquired in 1996. Effective July 1, 2002, the Linde Pension Plan was amended to give participating employees a one-time choice to remain covered by the old formula or to elect coverage under a new formula. The old formula is based predominantly on years of service, age and compensation levels prior to retirement, while the new formula provides for an annual contribution to an individual account which grows with interest each year at a predetermined rate. Also, this new formula applies to all new employees hired after April 30, 2002 into businesses adopting this plan. The U.S. and international pension plan assets are comprised of a diversified mix of investments, including domestic and international corporate equities, government securities and corporate debt securities. Linde has several plans that provide supplementary retirement benefits primarily to higher level employees that are unfunded and are nonqualified for federal tax purposes. Pension coverage for employees of certain of Linde's international subsidiaries generally is provided by those companies through separate plans. Obligations under such plans are primarily provided for through diversified investment portfolios, with some smaller plans provided for under insurance policies or by book reserves.

Defined Benefit Pension Plans - International

Linde has international, defined benefit commitments primarily in Germany and the United Kingdom (U.K.). The defined benefit commitments in Germany relate to old age pensions, invalidity pensions and surviving dependents pensions. These commitments also take into account vested rights for periods of service prior to January 1, 2002 based on earlier final-salary pension plan rules. In addition, there are direct commitments in respect of the salary conversion scheme for the form of cash balance plans. The resulting pension payments are calculated on the basis of an interest guarantee and the performance of the corresponding investment. There are no minimum funding requirements. The pension obligations in Germany are partly funded by a Contractual Trust Agreement (CTA). Defined benefit commitments in the U.K. prior to July 1, 2003 are earnings-related and dependent on the period of service. Such commitments relate to old age pensions, invalidity pensions and surviving dependents pensions. Beginning in April 1, 2011, the amount of future increases in inflation-linked pensions and of increases in pensionable emoluments was restricted.

Multi-employer Pension Plans

In the United States Linde participates in six multi-employer defined benefit pension plans ("MEPs"), pursuant to the terms of collective bargaining agreements, covering approximately 200 union-represented employees. The collective bargaining agreements expire on different dates through 2021. In connection with such agreements, the company is required to make periodic contributions to the MEPs in accordance with the terms of the respective collective bargaining agreements. Linde's participation in these plans is not material either at the plan level or in the aggregate. Linde's contributions to these plans were $2 million in 2018, 2017, and 2016 (these costs are not included in the tables that follow). For all MEPs, Linde's contributions were significantly less than 1% of the total contributions to each plan for 2017 and 2016. Total 2018 contributions were not yet available from the MEPs.

Linde has obtained the most recently available Pension Protection Act ("PPA") annual funding notices from the Trustees of the MEPs. The PPA classifies MEPs as either Red, Yellow or Green zone plans. Among other factors, plans in the Red zone are generally less than 65 percent funded with a projected insolvency date within the next twenty years; plans in the Yellow zone are generally 65 to 80 percent funded; and plans in the Green zone are generally at least 80 percent funded. According to the most current data available, three of the MEPs that the company participates in are in a Red zone status and three are in a Green zone status. As of December 31, 2018, the three Red Zone plans have pending or have implemented financial improvement or rehabilitation plans. Linde does not currently anticipate significant future obligations due to the funding status of these plans. If Linde determined it was probable that it would withdraw from an MEP, the company would record a liability for its portion of the MEP's unfunded pension obligations, as calculated at that time. Historically, such withdrawal payments have not been significant.

Defined Contribution Plans

Linde's U.S. business employees are eligible to participate in the Linde defined contribution savings plan. Employees may contribute up to 40% of their compensation, subject to the maximum allowable by IRS regulations. For the U.S. packaged gases business, company contributions to this plan are calculated as a percentage of salary based on age plus service. U.S. employees other than those in the packaged gases business have company contributions to this plan calculated on a graduated scale based on employee contributions to the plan. The cost for these defined contribution plans was $33 million in 2018, $29 million in 2017 and $28 million in 2016 (these costs are not included in the tables that follow).

The defined contribution plans include a non-leveraged employee stock ownership plan ("ESOP") which covers all employees participating in this plan. The collective number of shares of Linde ordinary shares in the ESOP totaled 2,381,714 at December 31, 2018.

Certain international subsidiaries of the company also sponsor defined contribution plans where contributions are determined under various formulas. The expense for these plans was $32 million in 2018, $21 million in 2017 and $18 million in 2016 (these expenses are not included in the tables that follow).

Postretirement Benefits Other Than Pensions (OPEB)

Linde provides health care and life insurance benefits to certain eligible retired employees. These benefits are provided through various insurance companies and healthcare providers. Linde is also obligated to make payments for a portion of postretirement benefits related to retirees of Linde's former parent. Additionally, as part of the CBI acquisition in 1996, Linde assumed responsibility for healthcare and life insurance benefit obligations for CBI's retired employees. All postretirement healthcare programs have cost caps that limit the company's exposure to future cost increases. In addition, as part of the retirement elections made for July 1, 2002, eligible employees were given the choice of maintaining coverage in the current retiree medical design (as may be amended from time to time), or to move to a design whereby coverage would be provided, but with no Linde subsidy whatsoever. Also, all new employees hired after April 30, 2002 into a business adopting these plans will not receive a company subsidy. Linde does not currently fund its postretirement benefits obligations. Linde's retiree plans may be changed or terminated by Linde at any time for any reason with no liability to current or future retirees.

Linde uses a measurement date of December 31 for its pension and other post-retirement benefit plans.

Pension and Postretirement Benefit Costs

The components of net pension and postretirement benefits other than pension ("OPEB") costs for 2018, 2017 and 2016 are shown in the table below (2018 reflects the impact of the Linde AG merger on October 31, 2018 (see

Notes 1 and 3) and the divestiture of Praxair's European industrial gases business on December 3, 2018 (see Notes 1 and 4)):

(Millions of dollars) Year Ended December 31,	Pensions 2018	Pensions 2017	Pensions 2016	OPEB 2018	OPEB 2017	OPEB 2016
Amount recognized in Operating Profit						
Service cost	$ 74	$ 46	$ 45	$ 2	$ 3	$ 2
Amount recognized in Net pension and OPEB cost (benefit), excluding service cost						
Interest cost	128	103	100	5	5	6
Expected return on plan assets	(219)	(161)	(157)	—	—	—
Net amortization and deferral	71	68	59	(3)	(3)	(3)
Curtailment gain (a)	—	—	—	—	(18)	—
Settlement charges (b)	14	2	4	—	—	—
	$ (6)	$ 12	$ 6	$ 2	$ (16)	$ 3
Amount recognized in Net gain on sale of businesses						
Settlement gains from divestitures (c)	(44)	—	—	—	—	—
Net periodic benefit cost (benefit)	$ 24	$ 58	$ 51	$ 4	$ (13)	$ 5

(a) The curtailment gain recorded during the year ended December 31, 2017 resulted from the termination of an OPEB plan in South America in the first quarter.

(b) 2018 includes the impacts of a $4 million charge and a $10 million charge recorded in the third and fourth quarters, respectively. In the third quarter, a series of lump sum benefit payments made from the U.S. supplemental pension plan triggered a settlement of the related pension obligation. In the fourth quarter, a change in control provision triggered the settlement of a U.S. non-qualified plan. 2017 includes the impact of a $2 million charge related to a series of lump sum benefit payments for employees under an international pension plan. 2016 includes a charge of $4 million related primarily to the retirement of senior managers in the United States (see Note 2).

(c) In connection with Praxair merger-related divestitures, primarily the European industrial gases business, certain European pension plan obligations were settled. This resulted in the recognition of associated pension benefit obligations and deferred losses in accumulated other comprehensive income (loss) within operating profit in the "Net gain on sale of businesses" line item.

Funded Status

The changes in benefit obligation and plan assets for Linde’s pension and OPEB programs, including reconciliation of the funded status of the plans to amounts recorded in the consolidated balance sheet, as of December 31, 2018 and 2017 are shown below (2018 reflects the impact of the Linde AG merger on October 31, 2018 (see Notes 1 and 3) and the divestiture of Praxair's European industrial gases business on December 3, 2018 (see Notes 1 and 4)):

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(Millions of dollars) Year Ended December 31,	Pensions 2018 U.S.	Pensions 2018 International	Pensions 2017 U.S.	Pensions 2017 International	OPEB 2018	OPEB 2017
Change in Benefit Obligation ("PBO")						
Benefit obligation, January 1	$ 2,215	$ 725	$ 2,066	$ 666	$ 146	$ 156
Merger impact (a)	415	6,920	—	—	53	—
Service cost	42	32	32	14	2	3
Interest cost	74	54	70	33	5	5
Divestitures (b)	—	(106)	—	—	—	—
Participant contributions	—	4	—	—	9	6
Plan amendment	—	1	—	—	—	—
Actuarial loss (gain)	(100)	7	153	8	(11)	(6)
Benefits paid	(138)	(84)	(106)	(43)	(19)	(13)
Plan curtailment	—	—	—	—	—	(6)
Foreign currency translation and other changes	—	(20)	—	47	(1)	1
Benefit obligation, December 31	$ 2,508	$ 7,533	$ 2,215	$ 725	$ 184	$ 146
Accumulated benefit obligation ("ABO")	$ 2,428	$ 7,385	$ 2,113	$ 691		
Change in Plan Assets						
Fair value of plan assets, January 1	$ 1,655	$ 567	$ 1,507	$ 507	$ —	$ —
Merger impact (a)	475	5,880	—	—	—	—
Actual return on plan assets	(72)	(88)	243	44	—	—
Company contributions	—	75	4	15	—	—
Benefits paid from plan assets	(106)	(69)	(99)	(32)	—	—
Divestitures (b)	—	(49)	—	—	—	—
Foreign currency translation and other changes	—	(24)	—	33	—	—
Fair value of plan assets, December 31	$ 1,952	$ 6,292	$ 1,655	$ 567	$ —	$ —
Funded Status, End of Year	$ (556)	$ (1,241)	$ (560)	$ (158)	$ (184)	$ (146)
Recorded in the Balance Sheet (Note 9)						
Other long-term assets	$ 47	$ 93	$ —	$ 17	$ —	$ —
Other current liabilities	(94)	(10)	(13)	(7)	(13)	(10)
Other long-term liabilities	(509)	(1,324)	(547)	(168)	(171)	(136)
Net amount recognized, December 31	$ (556)	$ (1,241)	$ (560)	$ (158)	$ (184)	$ (146)
Amounts recognized in accumulated other comprehensive income (loss) consist of:						
Net actuarial loss (gain)	$ 834	$ 339	$ 807	$ 192	$ (23)	$ (15)
Prior service cost (credit)	—	10	—	11	(5)	(6)
Deferred tax benefit (Note 7)	(212)	(87)	(309)	(47)	7	9
Amount recognized in accumulated other	$ 622	$ 262	$ 498	$ 156	$ (21)	$ (12)

comprehensive income (loss) (Note 9)						

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(a) Represents Linde AG plan assets and benefit obligations assumed as part of the merger. Such plan assets and benefit obligations were remeasured as of the merger date and all subsequent activity through December 31, 2018 is presented within the respective captions above.

Funded status information as of December 31, 2018 for select international pension plans is presented in the table below as the benefit obligations of these plans are considered to be significant relative to the total benefit obligation:

	United Kingdom	Germany	Other International	Total International
(Millions of dollars)	2018	2018	2018	2018
Benefit obligation, December 31	$ 4,444	$ 1,916	$ 1,173	$ 7,533
Fair value of plan assets, December 31	4,339	1,043	910	6,292
Funded Status, End of Year	$ (105)	$ (873)	$ (263)	$ (1,241)

(b) Represents plan assets and benefit obligations associated with the divestiture of the majority of the Praxair industrial gases business in Europe.

The changes in plan assets and benefit obligations recognized in other comprehensive income in 2018 and 2017 are as follows:

	Pensions		OPEB	
(Millions of dollars)	2018	2017	2018	2017
Current year net actuarial losses (gains)*	$ 286	$ 34	$ (11)	$ (6)
Amortization of net actuarial gains (losses)	(70)	(67)	2	1
Divestitures	(12)	—	—	—
Amortization of prior service credits (costs)	(1)	(1)	1	2
Pension settlements (Note 5)	(14)	(2)	—	—
Curtailments	—	—	—	12
Foreign currency translation and other changes	(16)	13	1	(2)
Total recognized in other comprehensive income	$ 173	$ (23)	$ (7)	$ 7

* Pension net actuarial losses in 2018 are primarily driven by a lower actual return on plan assets, which more than offset the benefit derived from favorable liability experience. Pension net actuarial losses in 2017 are driven by lower U.S. discount rates, which more than offset favorable plan asset experience. OPEB net actuarial gains in 2018 relate to the benefits from higher U.S. discount rates and favorable actual participant experience and net actuarial gains in 2017 relate primarily to favorable liability experience.

The amounts in accumulated other comprehensive income (loss) that are expected to be recognized as components of net periodic benefit cost during 2019 are as follows:

(Millions of dollars)	Pension	OPEB
Net actuarial loss (gain)	$ 54	$ (3)
Prior service cost (credit)	2	(1)
	$ 56	$ (4)

The following table provides information for pension plans where the accumulated benefit obligation exceeds the fair value of the plan assets:

	Pensions			
(Millions of dollars)	2018		2017	
Year Ended December 31,	U.S.	International	U.S.	International
Projected benefit obligation ("PBO")	$ 2,139	$ 6,681	$ 2,215	$ 391
Accumulated benefit obligation ("ABO")	$ 2,060	$ 6,586	$ 2,113	$ 383

Fair value of plan assets	$	1,482	$	5,307	$	1,655	$	215

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Assumptions

The assumptions used to determine benefit obligations are as of the respective balance sheet dates and the assumptions used to determine net benefit cost are as of the previous year-end, as shown below:

	Pensions				OPEB	
	U.S.		International			
	2018	2017	2018	2017	2018	2017
Weighted average assumptions used to determine benefit obligations at December 31,						
Discount rate	4.20 %	3.61 %	2.72 %	4.46 %	4.16 %	3.58 %
Rate of increase in compensation levels	3.25 %	3.25 %	2.38 %	3.35 %	N/A	N/A
Weighted average assumptions used to determine net periodic benefit cost for years ended December 31,						
Discount rate	3.73 %	4.05 %	2.73 %	5.09 %	3.81 %	4.21 %
Rate of increase in compensation levels	3.25 %	3.25 %	2.45 %	3.73 %	N/A	N/A
Expected long-term rate of return on plan assets (1)	7.62 %	8.00 %	5.13 %	7.91 %	N/A	N/A

(1) The expected long term rate of return on the U.S. and international plan assets is estimated based on the plans' investment strategy and asset allocation, historical capital market performance and, to a lesser extent, historical plan performance. For the U.S. plans, the expected rate of return of 7.62% was derived based on the target asset allocation of 40%-60% equity securities (approximately 9.5% expected return), 30%-50% fixed income securities (approximately 5.5% expected return) and 5%-15% alternative investments (approximately 7% expected return). For the international plans, the expected rate of return was derived based on the weighted average target asset allocation of 15%-25% equity securities (approximately 10% expected return), 30%-50% fixed income securities (approximately 7.5% expected return), and 30%-40% alternative investments (approximately 7.5% expected return). For the U.S. plan assets, the actual annualized total return for the most recent 10-year period ended December 31, 2018 was approximately 8.44%. For the international plan assets, the actual annualized total return for the same period was approximately 6.26%. Changes to plan asset allocations and investment strategy over this time period limit the value of historical plan performance as factor in estimating the expected long term rate of return. For 2019, the expected long-term rate of return on plan assets will be 7.50% for the U.S. plans. Expected weighted average returns for international plans will vary.

	OPEB	
Assumed healthcare cost trend rates	2018	2017
Praxair, Inc.		
Healthcare cost trend assumed	6.25 %	6.50 %
Rate to which the cost trend rate is assumed to decline (the ultimate trend rate)	5.00 %	5.00 %
Year that the rate reaches the ultimate trend rate	2023	2023
Linde AG		
Healthcare cost trend assumed	5.49 %	
Rate to which the cost trend rate is assumed to decline (the ultimate trend rate)	4.50 %	
Year that the rate reaches the ultimate trend rate	2038	

These healthcare cost trend rate assumptions have an impact on the amounts reported. However, cost caps limit the impact on the net OPEB benefit cost in the U.S. To illustrate the effect, a one-percentage point change in assumed

healthcare cost trend rates would have the following effects:

	One-Percentage Point	
(Millions of dollars)	Increase	Decrease
Effect on the total of service and interest cost components of net OPEB benefit cost	$ —	$ —
Effect on OPEB benefit obligation	$ 7	$ (6)

Pension Plan Assets

The investments of the U.S. pension plan are managed to meet the future expected benefit liabilities of the plan over the long term by investing in diversified portfolios consistent with prudent diversification and historical and expected capital market returns. When Linde became an independent, publicly traded company in 1992, its former parent retained all liabilities for its term-vested and retired employees. Linde's plan received assets and retained pension liabilities for its own active employee base. Therefore, the liabilities under the Linde U.S. pension plan mature at a later date compared to pension funds of other similar companies. Investment strategies are reviewed by management and investment performance is tracked against appropriate benchmarks. There are no concentrations of risk as it relates to the assets within the plans.

The international pension plans are managed individually based on diversified investment portfolios, with different target asset allocations that vary for each plan. Linde's U.S. and international pension plans' weighted-average asset allocations at December 31, 2018 and 2017, and the target asset allocation range for 2018, by major asset category, are as follows:

	U.S.				International			
Asset Category	**Target 2018 ****	**Target 2017**	**2018**	**2017**	**Target 2018 ****	**Target 2017**	**2018**	**2017**
Equity securities	40%-60%	50%-70%	48 %	61 %	15%-25%	30%-50%	20 %	38 %
Fixed income securities	30%-50%	20%-40%	40 %	30 %	30%-50%	40%-60%	46 %	53 %
Other	5%-15%	2%-10%	13 %	9 %	30%-40%	0%-10%	34 %	9 %

** Target asset allocations provided above for fiscal year 2018 are calculated based on weighting the individual Praxair and Linde AG pension plan target allocations by their respective portions of the total asset portfolio.

The following table summarizes pension assets measured at fair value by asset category at December 31, 2018 and 2017. During the years presented, there has been no transfer of assets between Levels 1, 2 and 3 (see Note 13 for definition of the levels):

	Fair Value Measurements Using							
	Level 1		Level 2		Level 3 **		Total	
(Millions of dollars)	2018	2017	2018	2017	2018	2017	2018	2017
Cash and cash equivalents	$ 348	$ 7	$ —	$ —	$ —	$ —	$ 348	$ 7
Equity securities:								
Global equities	1,131	302	—	—	—	—	1,131	302
Mutual funds	74	—	43	—	—	—	117	—
Fixed income securities:								
Government bonds	—	—	1,772	246	—	—	1,772	246
Emerging market debt	—	—	522	—	—	—	522	—
Mutual funds	109	118	21	—	—	—	130	118
Corporate bonds	—	—	382	181	—	—	382	181
Bank loans	—	—	313	—	—	—	313	—
Alternative investments:								
Insurance contracts	—	—	—	—	—	50	—	50
Real estate funds	—	—	—	—	298	158	298	158
Private debt	—	—	—	—	671	—	671	—
Other investments	—	—	33	—	—	—	33	—
Liquid alternative	—	—	1,192	—	—	—	1,192	—
Total plan assets at fair value, December 31,	$ 1,662	$ 427	$ 4,278	$ 427	$ 969	$ 208	$ 6,909	$ 1,062
Pooled funds *							1,335	1,160
Total fair value plan assets December 31,							$ 8,244	$ 2,222

* Pooled funds are measured using the net asset value ("NAV") as a practical expedient for fair value as permissible under the accounting standard for fair value measurements and have not been categorized in the fair value hierarchy.

** The following table summarizes changes in fair value of the pension plan assets classified as level 3 for the periods ended December 31, 2018 and 2017:

(Millions of dollars)	Insurance Contracts	Real Estate Funds	Private Debt	Total
Balance, December 31, 2016	$ 45	$ 135	$ —	$ 180
Gain/(Loss) for the period	(1)	12	—	11
Acquisitions	—	11	—	11
Foreign currency translation	6	—	—	6
Balance, December 31, 2017	50	158	—	208
Assumed in Linde AG merger	—	148	667	815
Gain/(Loss) for the period	—	9	4	13
Acquisitions	—	—	—	—
Merger-related divestitures	(49)	—	—	(49)
Other divestitures	—	(17)	—	(17)
Foreign currency translation	(1)	—	—	(1)
Balance, December 31, 2018	$ —	$ 298	$ 671	$ 969

The descriptions and fair value methodologies for the U.S. and international pension plan assets are as follows:

Cash and Cash Equivalents – This category includes cash and short-term interest bearing investments with maturities of three months or less. Investments are valued at cost plus accrued interest. Cash and cash equivalents are classified within level 1 of the valuation hierarchy.

Equity Securities – This category is comprised of shares of common stock in U.S. and international companies from a diverse set of industries and size. Common stock is valued at the closing market price reported on a U.S. or international exchange where the security is actively traded. Equity securities are classified within level 1 of the valuation hierarchy.

Mutual Funds – These categories consist of publicly and privately managed funds that invest primarily in marketable equity and fixed income securities. The fair value of these investments is determined by reference to the net asset value of the underlying securities of the fund. Shares of publicly traded mutual funds are valued at the net asset value quoted on the exchange where the fund is traded and are primarily classified as level 1 within the valuation hierarchy.

U.S. and International Government Bonds – This category includes U.S. treasuries, U.S. federal agency obligations and international government debt. The majority of these investments do not have quoted market prices available for a specific government security and so the fair value is determined using quoted prices of similar securities in active markets and is classified as level 2 within the valuation hierarchy.

Corporate Bonds – This category is comprised of corporate bonds of U.S. and international companies from a diverse set of industries and size. The fair values for U.S. and international corporate bonds are determined using quoted prices of similar securities in active markets and observable data or broker or dealer quotations. The fair values for these investments are classified as level 2 within the valuation hierarchy.

Pooled Funds - Pooled fund NAVs are provided by the trustee and are determined by reference to the fair value of the underlying securities of the trust, less its liabilities, which are valued primarily through the use of directly or indirectly observable inputs. Depending on the pooled fund, underlying securities may include marketable equity securities or fixed income securities.

Bank Loans - This category is comprised of traded syndicated loans of larger corporate borrowers. Such loans are issued by sub-investment grade rated companies both in the U.S. and internationally and are syndicated by investment banks to institutional investors. They are regularly traded in an active dealer market comprised of large investment banks, which supply bid and offer quotes and are therefore classified within level 2 of the valuation hierarchy.

Liquid Alternative Investments - This category is comprised of investments in alternative mutual funds whose holdings include liquid securities, cash, and derivatives. Such funds focus on diversification and employ a variety of investing strategies including long/short equity, multi-strategy, and global macro. The fair value of these investments is determined by reference to the net asset value of the underlying holdings of the fund, which can be determined using observable data (e.g., indices, yield curves, quoted prices of similar securities), and is classified within level 2 of the valuation hierarchy.

Insurance Contracts – The fair value of insurance contracts is determined based on the cash surrender value of the insurance contract, which is determined based on such factors as the fair value of the underlying assets and discounted cash flows. These contracts are with highly rated insurance companies. Insurance contracts are classified within level 3 of the valuation hierarchy.

Real Estate Funds – This category includes real estate properties, partnership equities and investments in operating companies. The fair value of the assets is determined using discounted cash flows by estimating an income stream for the property plus a reversion into a present value at a risk adjusted rate. Yield rates and growth assumptions utilized are derived from market transactions as well as other financial and industry data. The fair value for these investments are classified within level 3 of the valuation hierarchy.

Private Debt - This category includes non-traded, privately-arranged loans between one or a small group of private debt investment managers and corporate borrowers, which are typically too small to access the syndicated market and have no credit rating. This category also includes similar loans to real estate companies or individual properties. Loans included in this category are valued at par value, are held to maturity or to call, and are classified within level 3 of the valuation hierarchy.

Contributions

At a minimum, Linde contributes to its pension plans to comply with local regulatory requirements (e.g., ERISA in the United States). Discretionary contributions in excess of the local minimum requirements are made based on many factors, including long-term projections of the plans' funded status, the economic environment, potential risk of overfunding, pension insurance costs and alternative uses of the cash. Changes to these factors can impact the timing of discretionary contributions from year to year. Pension contributions were $87 million in 2018, $19 million in 2017 and $11 million in 2016. Estimated required contributions for 2019 are currently expected to be in the range of $95 million to $160 million.

Estimated Future Benefit Payments

The following table presents estimated future benefit payments, net of participants contributions:

(Millions of dollars)	Pensions		
Year Ended December 31,	**U.S.**	**International**	**OPEB**
2019 (a)	$ 353	$ 322	$ 14
2020	150	333	15
2021	146	344	15
2022	168	352	15
2023	149	364	14
2024-2028	767	1,018	59

(a) In January 2019, benefits of $91 million were paid related to the settlement of a U.S. non-qualified plan that was triggered due to a change in control provision. This resulted in a $51 million charge.

NOTE 19. COMMITMENTS AND CONTINGENCIES

The company accrues non income-tax liabilities for contingencies when management believes that a loss is probable and the amounts can be reasonably estimated, while contingent gains are recognized only when realized. In the event any losses are sustained in excess of accruals, they will be charged against income at that time. Attorney fees are recorded as incurred. Commitments represent obligations, such as those for future purchases of goods or services, that are not yet recorded on the company's balance sheet as liabilities. The company records liabilities for commitments when incurred (i.e., when the goods or services are received).

Contingent Liabilities

Linde is subject to various lawsuits and government investigations that arise from time to time in the ordinary course of business. These actions are based upon alleged environmental, tax, antitrust and personal injury claims, among others. Linde has strong defenses in these cases and intends to defend itself vigorously. It is possible that the company may incur losses in connection with some of these actions in excess of accrued liabilities. Management does not anticipate that in the aggregate such losses would have a material adverse effect on the company's consolidated financial position or liquidity; however, it is possible that the final outcomes could have a significant impact on the company's reported results of operations in any given period.

Significant matters are:

- During May 2009, the Brazilian government published Law 11941/2009 instituting a new voluntary amnesty program ("Refis Program") which allowed Brazilian companies to settle certain federal tax disputes at reduced amounts. During the 2009 third quarter, Praxair decided that it was economically beneficial to settle many of its outstanding federal tax disputes and such disputes were enrolled in the Refis Program, subject to final calculation and review by the Brazilian federal government. The company recorded estimated liabilities based on the terms of the Refis Program. Since 2009, Praxair has been unable to reach final agreement on the calculations and initiated litigation against the government in an attempt to resolve certain items. Open issues relate to the following matters: (i) application of cash deposits and net operating loss carryforwards to satisfy obligations and (ii) the amount of tax reductions available under the Refis Program. It is difficult to estimate the timing of resolution of legal matters in Brazil.

- At December 31, 2018 the most significant non-income and income tax claims in Brazil, after enrollment in the Refis Program, relate to state VAT tax matters and a federal income tax matter where the taxing authorities are challenging the tax rate that should be applied to income generated by a subsidiary company. The total estimated exposure relating to such claims, including interest and penalties, as appropriate, is approximately $205 million. Linde has not recorded any liabilities related to such claims based on management judgments, after considering judgments and opinions of outside counsel. Because litigation in Brazil historically takes many years to resolve, it is very difficult to estimate the timing of resolution of these matters; however, it is possible that certain of these matters may be resolved within the near term. The company is vigorously defending against the proceedings.

- On September 1, 2010, CADE ("Brazilian Administrative Council for Economic Defense") announced alleged anticompetitive activity on the part of five industrial gas companies in Brazil and imposed fines on all five companies. Originally, CADE imposed a civil fine of R$2.2 billion Brazilian reais (US$568 million) against White Martins, the Brazil-based subsidiary of Praxair. In response to a motion for clarification, the fine was reduced to R$1.7 billion Brazilian reais (US$439 million) due to a calculation error made by CADE. The amount of the fine is subject to indexation using SELIC. On September 2, 2010, Praxair issued a press release and filed a report on Form 8-K rejecting all claims and stating that the fine represents a gross and arbitrary disregard of Brazilian law.

  On October 19, 2010, White Martins filed an annulment petition ("appeal") with the Federal Court in Brasilia seeking to have the fine against White Martins entirely overturned. In order to suspend payment of the fine pending the completion of the appeal process, Brazilian law required that the company tender a form of guarantee in the amount of the fine as security. Initially, 50% of the guarantee was satisfied by letters of credit with a financial institution and 50% by equity of a Brazilian subsidiary. On April 15, 2016, the Ninth Federal Court in Brasilia allowed White Martins to withdraw and cancel the letters of credit. Accordingly, the guarantee is currently satisfied solely by equity of a Brazilian subsidiary.

On September 14, 2015, the Ninth Federal Court of Brasilia overturned the fine against White Martins and declared the original CADE administrative proceeding to be null and void. On June 30, 2016, CADE filed an appeal against this decision with the Federal Circuit Court in Brasilia.

Praxair strongly believes that the allegations are without merit and that the fine will be entirely overturned during the appeal process. The company further believes that it has strong defenses and will vigorously defend against the allegations and related fine up to such levels of the Federal Courts in Brazil as may be necessary. Because appeals in Brazil historically take many years to resolve, it is very difficult to estimate when the appeal will be finally decided. Based on management judgments, after considering judgments and opinions of outside counsel, no reserve has been recorded for this proceeding as management does not believe that a loss is probable.

- As stated above, in 2010, the Brazilian competition authority CADE imposed fines on a number of gases companies, including Linde AG's Brazilian subsidiary, on the grounds of alleged anti-competitive business conduct. CADE imposed a fine of approximately R$188 million Brazilian reais (US $49 million) on Linde AG's Brazilian subsidiary. Based on the fact that the fine has been overturned by a federal court in the first instance and on a subsequent appeal by CADE, Linde believes that this decision will not stand up to judicial review in the third instance either, and deems the possibility of cash outflows to be extremely unlikely. As a result, no reserve has been recorded for this proceeding as management does not believe that a loss is probable.

Commitments

At December 31, 2018, Linde had undrawn outstanding letters of credit, bank guarantees and surety bonds valued at approximately $2,961 million from financial institutions. These relate primarily to customer contract performance guarantees (including plant construction in connection with certain on-site contracts), self-insurance claims and other commercial and governmental requirements, including foreign litigation matters.

Other commitments related to leases, tax liabilities for uncertain tax positions, long-term debt, other post retirement and pension obligations are summarized elsewhere in the financial statements (see Notes 6, 7, 13, and 18).

NOTE 20. SEGMENT INFORMATION

Effective October 31, 2018, Praxair and Linde AG completed the previously announced merger of equals transaction pursuant to the business combination agreement, resulting in a newly formed corporation named Linde plc. See Notes 1,3 and 4 for additional information on the merger. Although it is the company's intention to create new operating segments that will be used by management to allocate company resources and assess performance, due to the hold separate order with the U.S. Federal Trade Commission (see Note 1) it was not possible to implement this new management organization structure in calendar 2018. Therefore, the company has added Linde AG as a separate segment for 2018 reporting purposes effective with the merger date, which is consistent with the way the company was managed and results reviewed by the Chief Operating Decision Maker. As the restrictions under the hold separate order was lifted effective March 1, 2019, the company implemented a new operating segment structure effective for 2019 reporting periods, as follows: Americas; EMEA (Europe/Middle East/Africa); APAC (Asia/Pacific), Engineering and Other.

Accordingly, during 2018 the company's operations were organized into five reportable segments, four of which have been determined on a geographic basis of segmentation: North America, Europe, South America and Asia. The company's worldwide surface technologies business represents the fifth reportable segment. As discussed above, Linde AG became a sixth reportable segment effective with the merger on October 31, 2018.

Linde's operations consist of two major product lines: industrial gases and surface technologies. The industrial gases product line centers on the manufacturing and distribution of atmospheric gases (oxygen, nitrogen, argon, rare gases) and process gases (carbon dioxide, helium, hydrogen, electronic gases, specialty gases, acetylene). Many of these products are co-products of the same manufacturing process. Linde manufactures and distributes nearly all of its products and manages its customer relationships on a regional basis. Linde's industrial gases are distributed to various end-markets within a regional segment through one of three basic distribution methods: on-site or tonnage; merchant or bulk; and packaged or cylinder gases. The distribution methods are generally integrated in order to best meet the customer's needs and very few of its products can be economically transported outside of a region. Therefore, the distribution economics are specific to the various geographies in which the company operates and are consistent with how management assesses performance.

Linde evaluates the performance of its reportable segments based primarily on operating profit, excluding purchase accounting impacts of Linde AG, inter-company royalties and items not indicative of ongoing business trends. Corporate and globally managed expenses, and research and development costs relating to Praxair's global industrial gases business, are allocated to operating segments based on sales.

The table below presents information about reportable segments for the years ended December 31, 2018, 2017 and 2016.

(Millions of dollars)	2018	2017	2016
Sales (a)			
North America	$ 6,420	$ 6,023	$ 5,592
Europe	1,592	1,558	1,392
South America	1,369	1,501	1,399
Asia	1,964	1,738	1,555
Surface Technologies	682	617	596
Linde AG	2,873	$ —	$ —
	$ 14,900	$ 11,437	$ 10,534

	2018	2017	2016
Operating Profit			
North America	$ 1,648	$ 1,517	$ 1,431
Europe	316	301	274
South America	215	239	263
Asia	427	333	276
Surface Technologies	118	106	99
Linde AG	252	—	—
Segment operating profit	2,976	2,496	2,343
Transaction costs and other charges	(309)	(52)	(96)
Net gain on sale of business	3,294	—	—
Purchase accounting impacts - Linde AG	(714)	—	—
Total operating profit	$ 5,247	$ 2,444	$ 2,247

	2018	2017	2016
Total Assets (b)			
North America	$ 11,643	$ 10,419	$ 10,019
Europe	769	3,282	2,928
South America	2,675	2,738	2,748
Asia	3,518	3,252	2,984
Surface Technologies	940	745	653
Linde AG	73,841	—	—
	$ 93,386	$ 20,436	$ 19,332

	2018	2017	2016
Depreciation and Amortization			
North America	$ 660	$ 631	$ 614
Europe	146	169	155
South America	148	159	133
Asia	204	185	179
Surface Technologies	44	40	41
Linde AG	282	—	—
Segment depreciation and amortization	1,484	1,184	1,122
Purchase accounting impacts - Linde AG	346	—	—
Total depreciation and amortization	$ 1,830	$ 1,184	$ 1,122

	2018	2017	2016
Capital Expenditures and Acquisitions			
North America	$ 916	$ 779	$ 989
Europe	157	141	402
South America	97	129	232
Asia	248	209	165
Surface Technologies	93	86	40
Linde AG	397	—	—
	$ 1,908	$ 1,344	$ 1,828

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	2018	2017	2016
Sales by Product Group			
Atmospheric gases and related	$ 8,375	$ 7,938	$ 7,329
Process gases and other	2,970	2,882	2,609
Surface technologies	682	617	596
Linde AG	2,873	—	—
	$ 14,900	$ 11,437	$ 10,534

	2018	2017	2016
Sales by Major Country			
United States	$ 5,942	$ 4,973	$ 4,623
Europe, excluding Germany	2,435	1,372	1,240
Brazil	1,067	1,179	1,091
China	1,032	735	613
Germany	868	401	373
Other – foreign	3,556	2,777	2,594
	$ 14,900	$ 11,437	$ 10,534

	2018	2017	2016
Long-lived Assets by Major Country (c)			
United States	$ 7,189	$ 4,979	$ 4,779
Europe, excluding Germany	7,754	1,318	1,170
Germany	2,411	413	379
China	2,237	1,060	975
Brazil	1,012	1,204	1,240
Other – foreign	9,114	2,851	2,706
Total long-lived assets	$ 29,717	$ 11,825	$ 11,249

(a) Sales reflect external sales only and include two months of Linde AG sales from the merger date of October 31, 2018 to year end. Intersegment sales, primarily from North America to other segments, were not material.

(b) Includes equity investments as of December 31, as follows:

(Millions of dollars)	2018	2017	2016
North America	$ 118	$ 115	$ 121
Europe (i)	34	287	243
Asia	306	325	353
Linde AG (ii)	1,380	—	—
	$ 1,838	$ 727	$ 717

(i) The reduction in European equity investments relates primarily to the sale of Praxair's 34% non-controlling interest participation in its Italian joint venture - refer to Note 4, Divestitures, for additional information. Other fluctuations relate to equity investment earnings, dividends, and foreign currency impacts.

(ii) Linde AG equity investments relate primarily to Asia.

(c)

Long-lived assets include property, plant and equipment – net and reflect the impact of the merger with Linde AG (refer to Note 3).

NOTE 21. REVENUE RECOGNITION

Effective January 1, 2018, Linde adopted the FASB's Accounting Standards Update No. 2014-09 ("ASC 606") relating to Revenue Recognition using the modified retrospective transition method. The new accounting standard requires revenue to be recognized as control of goods or services are transferred to customers in an amount that reflects the consideration to which an entity expects to be entitled to receive in exchange for the goods or services. No material differences in revenue recognition were identified as compared to the company's historical revenue recognition accounting; accordingly, there is no adjustment to opening retained earnings at January 1, 2018 and therefore no need to present comparable revenue in accordance with the prior accounting policy. The following sections include Linde's revenue recognition accounting policies and disclosures in accordance with ASC 606.

Contracts with Customers

Approximately 76% of Linde's consolidated sales are generated from industrial gases and related products in four geographic segments (North America, Europe, South America and Asia), Linde AG represents approximately 19% of 2018 sales and the remaining 5% is related to the global surface technologies segment. Linde serves a diverse group of industries including healthcare, petroleum refining, manufacturing, food, beverage carbonation, fiber-optics, steel making, aerospace, chemicals and water treatment.

Industrial Gases

Within each of the company's geographic segments for industrial gases, there are three basic distribution methods: (i) on-site or tonnage; (ii) merchant or bulk liquid; and (iii) packaged or cylinder gases. The distribution method used by Linde to supply a customer is determined by many factors, including the customer's volume requirements and location. The distribution method generally determines the contract terms with the customer and, accordingly, the revenue recognition accounting practices. Linde's primary products in its industrial gases business are atmospheric gases (oxygen, nitrogen, argon, rare gases) and process gases (carbon dioxide, helium, hydrogen, electronic gases, specialty gases, acetylene). These products are generally sold through one of the three distribution methods.

Following is a description of each of the three industrial gases distribution methods and the respective revenue recognition policies:

On-site. Customers that require the largest volumes of product and that have a relatively constant demand pattern are supplied by cryogenic and process gas on-site plants. Linde constructs plants on or adjacent to these customers' sites and supplies the product directly to customers by pipeline. Where there are large concentrations of customers, a single pipeline may be connected to several plants and customers. On-site product supply contracts generally are total requirement contracts with terms typically ranging from 10-20 years and contain minimum purchase requirements and price escalation provisions. Many of the cryogenic on-site plants also produce liquid products for the merchant market. Therefore, plants are typically not dedicated to a single customer. Additionally, Linde is responsible for the design, construction, operations and maintenance of the plants and customers typically have no involvement in these activities. Advanced air separation processes also allow on-site delivery to customers with smaller volume requirements.

The company's performance obligations related to on-site customers are satisfied over time as customers receive and obtain control of the product. Linde has elected to apply the practical expedient for measuring progress towards the completion of a performance obligation and recognizes revenue as the company has the right to invoice each customer, which generally corresponds with product delivery. Accordingly, revenue is recognized when product is delivered to the customer and the company has the right to invoice the customer in accordance with the contract terms. Consideration in these contracts is generally based on pricing which fluctuates with various price indices. Variable components of consideration exist within on-site contracts but are considered constrained.

Merchant. Merchant deliveries generally are made from Linde's plants by tanker trucks to storage containers at the customer's site. Due to the relatively high distribution cost, merchant oxygen and nitrogen generally have a relatively small distribution radius from the plants at which they are produced. Merchant argon, hydrogen and helium can be shipped much longer distances. The customer agreements used in the merchant business are usually three-to seven-year supply agreements based on the requirements of the customer. These contracts generally do not contain minimum purchase requirements or volume commitments.

The company's performance obligations related to merchant customers are generally satisfied at a point in time as the customers receive and obtain control of the product. Revenue is recognized when product is delivered to the customer and the company has the right to invoice the customer in accordance with the contract terms. Any variable components of consideration within merchant contracts are constrained however this consideration is not significant.

Packaged Gases. Customers requiring small volumes are supplied products in containers called cylinders, under medium to high pressure. Linde distributes merchant gases from its production plants to company-owned cylinder filling plants where cylinders are then filled for distribution to customers. Cylinders may be delivered to the customer's site or picked up by the customer at a packaging facility or retail store. Linde invoices the customer for the industrial gases and the use of the cylinder container(s). The company also sells hardgoods and welding equipment purchased from independent manufacturers. Packaged gases are generally sold under one to three-year supply contracts and purchase orders and do not contain minimum purchase requirements or volume commitments.

The company's performance obligations related to packaged gases are satisfied at a point in time. Accordingly, revenue is recognized when product is delivered to the customer or when the customer picks up product from a packaged gas facility or retail store, and the company has the right to payment from the customer in accordance with the contract terms. Any variable consideration is constrained and will be recognized when the uncertainty related to the consideration is resolved.

Surface Technologies

The company's surface technologies segment, operated through Praxair Surface Technologies, Inc., supplies wear-resistant and high-temperature corrosion-resistant metallic and ceramic coatings and powders. Praxair Surface Technologies is a leading global supplier of coatings services and thermal spray consumables to customers in the aircraft, energy, printing, primary metals, petrochemical, textile, and other industries. Its coatings are used to provide wear resistance, corrosion protection, thermal insulation, and many other surface-enhancing functions which serve to extend component life, enable optimal performance, and reduce operating costs. It also manufactures a complete line of electric arc, plasma and wire spray, and high-velocity oxy-fuel ("HVOF") equipment.

The company's performance obligation related to surface technologies customers are generally satisfied at a point in time when the customer receives and takes control of product. Accordingly, revenue is recognized when product is delivered to the customer or when the customer picks up the product from the company's facility, and the company has the right to invoice the customer in accordance with the contract terms.

Linde Engineering

The company designs and manufactures equipment for air separation and other industrial gas applications manufactured specifically for end customers. Sale of equipment contracts are generally comprised of a single performance obligation. Revenue from sale of equipment is generally recognized over time as Linde has an enforceable right to payment for performance completed to date and performance does not create an asset with alternative use. For contracts recognized over time, revenue is recognized primarily using a cost incurred input method. Costs incurred to date relative to total estimated costs at completion are used to measure progress toward satisfying performance obligations. Costs incurred include material, labor, and overhead costs and represent work contributing and proportionate to the transfer of control to the customer. Contract modifications are typically accounted for as part of the existing contract and are recognized as a cumulative adjustment for the inception-to-date effect of such change.

Contract Assets and Liabilities

Contract assets and liabilities result from differences in timing of revenue recognition and customer invoicing. Contract assets primarily relate to sale of equipment contracts for which revenue is recognized over time. The balance represents unbilled revenue which occurs when revenue recognized under the measure of progress exceeds amounts invoiced to customers. Customer invoices may be based on the passage of time, the achievement of certain contractual milestones or a combination of both criteria.

Contract liabilities include advance payments or right to consideration prior to performance under the contract. Contract liabilities are recognized as revenue as performance obligations are satisfied under contract terms.

Linde has contract assets of $283 million and contract liabilities of $1,546 million at December 31, 2018. Contract assets and liabilities primarily relate to the Linde Engineering business acquired in the merger. The Industrial Gases Businesses and Surface Technologies do not have material contract assets or liabilities.

Payment Terms and Other

Linde generally receives payment after performance obligations are satisfied, and customer prepayments are not typical for the Industrial Gases Businesses and Surface Technologies. Payment terms vary based on the country where sales originate and local customary payment practices. Linde does not offer extended financing outside of customary payment terms. Amounts billed for sales and use taxes, value-added taxes, and certain excise and other specific transactional taxes imposed on revenue producing transactions are presented on a net basis and are not included in sales within the consolidated statement of income. Additionally, sales returns and allowances are not a normal practice in the industry and are not significant.

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Disaggregated Revenue Information

The company manages its industrial gases business on a geographic basis, while the surface technologies business is managed on a global basis. Linde AG had been managed as a separate segment due to the restrictions under the hold separate order, which were lifted on March 1, 2019. Further, the company believes that reporting sales by distribution method by reportable geographic segment best illustrates the nature, timing, type of customer, and contract terms for its revenues, including terms and pricing.

The following table shows sales by distribution method for each reportable segment and at the consolidated level for the year ended December 31, 2018.

(Dollars in Millions)

Sales	North America	Europe	South America	Asia	Surface Technologies	Linde AG	Total	%
Merchant	$ 2,364	$ 548	$ 520	$ 624	$ —	$ 524	$ 4,580	31 %
On-Site	1,901	291	454	984	—	501	4,131	28 %
Packaged Gas	1,995	685	361	221	—	1,257	4,519	30 %
Other	160	68	34	135	682	591	1,670	11 %
	$ 6,420	$ 1,592	$ 1,369	$ 1,964	$ 682	$ 2,873	$ 14,900	100 %

Remaining Performance Obligations

As described above, Linde’s contracts with on-site customers are under long-term supply arrangements which generally require the customer to purchase their requirements from Linde and also have minimum purchase requirements. The company estimates the consideration related to minimum purchase requirements is approximately $45 billion. This amount excludes all sales above minimum purchase requirements, which can be significant depending on customer needs. In the future, actual amounts will be different due to impacts from several factors, many of which are beyond the company’s control including, but not limited to, timing of newly signed, terminated and renewed contracts, inflationary price escalations, currency exchange rates, and pass-through costs related to natural gas and electricity. The actual duration of long-term supply contracts ranges up to twenty years. The company estimates that approximately half of the revenue related to minimum purchase requirements are estimated to be earned in the next five years and the remaining thereafter.

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NOTE 22. QUARTERLY DATA (UNAUDITED)

(Dollar amounts in millions, except per share data)

2018	1Q (a)	2Q (a)	3Q (a)	4Q (a)	YEAR (a)
Sales	$ 2,999	$ 3,061	$ 3,024	$ 5,816	$ 14,900
Cost of sales, exclusive of depreciation and amortization	$ 1,677	$ 1,723	$ 1,714	$ 3,970	$ 9,084
Depreciation and amortization	$ 311	$ 311	$ 306	$ 902	$ 1,830
Operating profit	$ 653	$ 689	$ 669	$ 3,236	$ 5,247
Net income – Linde plc	$ 462	$ 480	$ 461	$ 2,978	$ 4,381
Income from continuing operations	$ 462	$ 480	$ 461	$ 2,870	$ 4,273
Income from discontinued operations	$ —	$ —	$ —	$ 108	$ 108
Basic Per Share Data					
Income from continuing operations *	$ 1.61	$ 1.67	$ 1.60	$ 6.27	$ 12.93
Income from discontinued operations *	—	—	—	0.24	0.33
Weighted average shares (000’s)	287,504	287,803	288,093	457,518	330,401
Diluted Per Share Data					
Income from continuing operations *	$ 1.59	$ 1.65	$ 1.58	$ 6.22	$ 12.79
Income from discontinued operations *	—	—	—	0.23	0.32
Weighted average shares (000’s)	290,809	290,908	291,513	461,150	$ 334,127

2017	1Q (a)	2Q (a)	3Q (a)	4Q (a)	YEAR (a)
Sales	$ 2,728	$ 2,834	$ 2,922	$ 2,953	$ 11,437
Cost of sales, exclusive of depreciation and amortization	$ 1,549	$ 1,599	$ 1,652	$ 1,661	$ 6,461
Depreciation and amortization	$ 287	$ 292	$ 298	$ 307	$ 1,184
Operating profit	$ 567	$ 606	$ 632	$ 639	$ 2,444
Net income – Linde plc	$ 389	$ 406	$ 419	$ 33	$ 1,247
Basic Per Share Data					
Net income	$ 1.36	$ 1.42	$ 1.46	$ 0.11	$ 4.36
Weighted average shares (000’s)	285,509	286,090	286,467	286,976	286,261
Diluted Per Share Data					
Net income	$ 1.35	$ 1.41	$ 1.45	$ 0.11	$ 4.32
Weighted average shares (000’s)	287,384	288,535	289,216	290,456	289,114

* Due to quarterly changes in the share count as a result of the merger the sum of the four quarters does not equal the earnings per share amount calculated for the year.

(a) 2018 and 2017 include the impact of the following matters (see Notes 3, 4, 5, 7, 13 and 18):

(Millions of dollars)	Operating Profit/ (Loss)	Income from Continuing Operations
Transaction costs and other charges - Q1	$ (19)	$ (18)
Transaction costs and other charges - Q2	(24)	(21)
Transaction costs and other charges - Q3	(31)	(29)
Pension settlement charge - Q3	—	(3)
Transaction costs and other charges - Q4	(235)	(238)
Gain on sale of business - Q4	3,294	2,923
Bond redemption - Q4	—	(20)
Pension settlement charge - Q4	—	(8)
Tax Act and other tax charges - Q4	—	17
Purchase accounting impacts - Linde AG - Q4	(714)	(451)
Year 2018	$ 2,271	$ 2,152
Transaction costs and other charges - Q1	$ (6)	$ (6)
Transaction costs and other charges - Q2	(15)	(15)
Transaction costs and other charges - Q3	(14)	(13)
Pension settlement charge - Q3	—	(1)
Transaction costs and other charges - Q4	(17)	(14)
Tax Act - Q4	—	(394)
Year 2017	$ (52)	$ (443)

NOTE 23. SUBSEQUENT EVENTS

Divestitures

On March 1, 2019, Linde AG completed the sale of the majority of its industrial gases business in North America and certain industrial gases business activities in South America to a consortium comprising companies of the German industrial gases manufacturer Messer Group and CVC Capital Partners Fund VII, pursuant to a Sale and Purchase Agreement, dated July 16, 2018, as amended on September 22, 2018, October 19, 2018 and February 20, 2019, by and among the Company, Linde AG, Praxair, Inc., Messer Group and CVC Capital Partners Fund VII (the “SPA”). Messer Group and CVC Capital Partners Fund VII paid $2.97 billion in cash consideration after purchase price adjustments for certain items relating to assets and liabilities of the sold businesses. The SPA was entered into as part of the commitments in connection with the merger control review by the U.S. Federal Trade Commission (the “FTC”) of the previously completed combination of the businesses of Praxair, Inc. and Linde AG under the Company (the ”business combination” - see Note 1).

As part of the company’s, Praxair’s and Linde AG’s further commitments in connection with the merger control review by the FTC, Linde AG divested additional assets within the Americas for aggregate net proceeds of $531 million (i) to Matheson Tri-Gas, Inc., five of Linde AG’s HyCO facilities outside the Gulf Coast region, along with Linde AG’s hydrogen pipeline in the Gulf Coast, intellectual property, customer contracts, and other assets, (ii) to Celanese Corporation, Linde AG's Clear Lake, Texas plant, and (iii) to LyondellBasell Industries N.V., Linde AG’s La Porte, Texas plant.

Hold Separate Order

Additionally, concurrent with the sale of the required merger-related divestitures in the United States, on March 1, 2019, the hold separate order restrictions described in Note 1 were lifted and the Company was able to commence integration activities.

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

None.

ITEM 9A. CONTROLS AND PROCEDURES

Conclusion Regarding the Effectiveness of Disclosure Controls and Procedures

Based on an evaluation of the effectiveness of Linde's disclosure controls and procedures, which was made under the supervision and with the participation of management, including Linde's principal executive officer and principal financial officer, the principal executive officer and principal financial officer have each concluded that, as of the end of the annual period covered by this report, such disclosure controls and procedures are effective in ensuring that information required to be disclosed by Linde in reports that it files or submits under the Exchange Act of 1934 is recorded, processed, summarized and reported within the time periods specified in the Securities and Exchange Commission's rules and forms, and accumulated and communicated to management including Linde's principal executive officer and principal financial officer, to allow timely decisions regarding required disclosure.

Management's Report on Internal Control Over Financial Reporting

Refer to Item 8 for Management's Report on Internal Control Over Financial Reporting as of December 31, 2018.

Changes in Internal Control over Financial Reporting

There were no changes in Linde's internal control over financial reporting that occurred during the quarter ended December 31, 2018 that have materially affected, or are reasonably likely to materially affect, Linde's internal control over financial reporting.

ITEM 9B. OTHER INFORMATION

None.

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

Certain information required by this item is incorporated herein by reference to the sections captioned "Corporate Governance and Board Matters - Director Nominees" and "Corporate Governance And Board Matters - Section 16(a) Beneficial Ownership Reporting Compliance" in Linde's Proxy Statement to be filed by April 30, 2019 for the Annual General Meeting.

Identification of the Audit Committee

Linde has a separately-designated standing Audit Committee established in accordance with Section 3(a)(58)(A) of the Securities Exchange Act of 1934 as amended (the "Exchange Act"). The members of that audit committee are Prof. Dr. Clemens Börsig (chairman), Dr. Nance K. Dicciani, Dr. Thomas Enders, Edward G. Galante, Larry D. McVay and Dr. Victoria Ossadnik, and each member is independent within the meaning of the independence standards adopted by the Board of Directors and those of the New York Stock Exchange.

Audit Committee Financial Expert

The Linde Board of Directors has determined that Prof. Dr. Clemens Börsig is an "audit committee financial expert" as defined by Item 407(d)(5)(ii) of Regulation S-K of the Exchange Act and is independent within the meaning of the independence standards adopted by the Board of Directors and those of the New York Stock Exchange.

Code of Ethics

Linde has adopted a code of ethics that applies to the company's directors and all employees, including its Chief Executive Officer, Chief Financial Officer, and Controller. This code of ethics, including specific standards for implementing certain provisions of the code, has been approved by the Linde Board of Directors and is named the "Code of Business Integrity". This document is posted on the company's public website, www.linde.com but is not incorporated herein.

ITEM 11. EXECUTIVE COMPENSATION

Information required by this item is incorporated herein by reference to the sections captioned "Executive Compensation Matters" and "Corporate Governance and Board Matters - Director Compensation" in Linde's Proxy Statement to be filed by April 30, 2019 for the Annual General Meeting.

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ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

Equity Compensation Plans Information - The table below provides information as of December 31, 2018 about company shares that may be issued upon the exercise of options, warrants and rights granted to employees or members of Linde's Board of Directors under equity compensation plans that were assumed by Linde upon the completion of the business combination on October 31, 2018.

EQUITY COMPENSATION PLANS TABLE

Plan Category	Number of securities to be issued upon exercise of outstanding options, warrants and rights (a)		Weighted-average exercise price of outstanding options, warrants and rights (b)	Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in column (a)) (c)	
Equity compensation plans approved by shareholders	11,694,110	(1)	$ 117.65	8,482,731	(2)
Equity compensation plans not approved by shareholders	—		—	—	
Total	11,694,110		$ 117.65	8,482,731	

(1) This amount includes 1,070,423 restricted shares.

(2) This amount includes 8,009,603 shares available for future issuance pursuant to the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan assumed by Linde, and 473,128 shares available for future issuance pursuant to the Linde plc Long Term Incentive Plan 2018.

Certain information required by this item regarding the beneficial ownership of the company's ordinary shares is incorporated herein by reference to the section captioned "Information on Share Ownership" in Linde's Proxy Statement to be filed by April 30, 2019 for the Annual General Meeting.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS AND DIRECTOR INDEPENDENCE

Information required by this item is incorporated herein by reference to the sections captioned "Corporate Governance And Board Matters – Review, Approval or Ratification of Transactions with Related Persons," "Corporate Governance And Board Matters – Certain Relationships and Transactions," and "Corporate Governance And Board Matters – Director Independence" in Linde's Proxy Statement to be filed by April 30, 2019 for the Annual General Meeting.

ITEM 14. PRINCIPAL ACCOUNTING FEES AND SERVICES

Information required by this item is incorporated herein by reference to the section captioned "Audit Matters" in Linde's Proxy Statement to be filed by April 30, 2019 for the Annual General Meeting.

PART IV

ITEM 15. EXHIBITS, FINANCIAL STATEMENT SCHEDULES

(a) The following documents are filed as part of this report:

(1) The company's 2018 Consolidated Financial Statements and the Report of the Independent Registered Public Accounting Firm are included in Part II, Item 8. Financial Statements and Supplementary Data.

(2) Financial Statement Schedules – All financial statement schedules have been omitted because they are not applicable or the required information is shown in the financial statements or notes thereto.

(3) Exhibits – The exhibits filed as part of this Annual Report on Form 10-K are listed in the accompanying index.

INDEX TO EXHIBITS

Linde plc and Subsidiaries

Exhibit No.	Description
2.1	Business Combination Agreement by and among Linde Aktiengesellschaft, Praxair, Inc., Zamalight PLC, Zamalight Holdco LLC and Zamalight Subco, Inc. dated as of June 1, 2017 (Filed as Exhibit 2.1 to Praxair, Inc.'s Current Report on Form 8-K dated June 1, 2017, Filing No. 1-11037, and is incorporated herein by reference.)
2.1a	Amendment No. 1, dated August 10, 2017, to the Business Combination Agreement, by and among Praxair, Inc., Linde Aktiengesellschaft, Linde plc, Zamalight Holdco LLC and Zamalight Subco, Inc. (Filed as Exhibit 2.1 to Praxair, Inc.'s Current Report on Form 8-K dated August 10, 2017, Filing No. 1-11037, and is incorporated hereby by reference.)
**2.2	Sale and Purchase Agreement, dated July 5, 2018, by and among Praxair, Inc., Taiyo Nippon Sanso Corporation (“Taiyo”), and Linde plc with respect to the sale of a majority of Praxair’s businesses in Europe to Taiyo in connection with the Business Combination Agreement (Filed as Exhibit 2.1 to the Company’s Quarterly Report on Form 10-Q for the quarter ended September 30, 2018, File No. 1-38730, and is incorporated hereby by reference).
**2.3	Sale and Purchase Agreement, dated July 16, 2018, by and among Linde AG, Praxair, Inc., MG Industries GmbH, Messer Canada Inc., MG Industries USA, Inc. (the MG entities and Messer Canada, Inc. being collectively referred to as “Messer”), and Linde plc with respect to the sale of certain assets of Linde AG in the Americas and certain assets of Praxair, Inc. to Messer in connection with the Business Combination Agreement (Filed as Exhibit 2.2 to the Company’s Quarterly Report on Form 10-Q for the quarter ended September 30, 2018, File No. 1-38730, and is incorporated hereby by reference).
**2.3a	First Amendment dated September 21, 2018 to the Sale and Purchase Agreement, dated July 16, 2018, by and among Linde AG, Praxair, Inc., Messer, and Linde plc with respect to the sale of certain additional assets of Linde AG in the Americas to Messer in connection with the Business Combination Agreement (Filed as Exhibit 2.3 to the Company’s Quarterly Report on Form 10-Q for the quarter ended September 30, 2018, File No. 1-38730, and is incorporated hereby by reference).
**2.3b	Second Amendment dated October 19, 2018 to the Sale and Purchase Agreement, dated July 16, 2018, as amended by the First Amendment thereto, by and among Linde AG, Praxair, Inc., Messer, and Linde plc, with respect to the sale of certain additional assets of Linde AG in the Americas to Messer in connection with the Business Combination Agreement (Filed as Exhibit 2.2 to the Company’s Quarterly Report on Form 10-Q for the quarter ended September 30, 2018, File No. 1-11037, and is incorporated hereby by reference).
**2.3c	Third Amendment dated February 20, 2019 to the Sale and Purchase Agreement, dated July 16, 2018, as amended by the First and Second Amendment thereto, by and among Linde AG, Praxair, Inc., Messer, and Linde plc, with respect to the sale of certain additional assets of Linde AG in the Americas to Messer in connection with the Business Combination Agreement dated as of June 1, 2017, as amended, to effect a combination of the businesses of Linde AG and Praxair, Inc. (Filed as Exhibit 2.4 to the Company’s Current Report on Form 8-K, filed on March 7, 2019, File No. 1-11037, and is incorporated hereby by reference).
3.01	Amended and Restated Public Limited Company Constitution of Linde plc (Filed as Exhibit 3.1 to the Company’s Current Report on Form 8-K, filed on October 31, 2018, File No. 333-218485, and incorporated herein by reference).
4.01	Indenture, dated as of July 15, 1992, between Praxair, Inc. and U.S. Bank National Association, as the ultimate successor trustee to Bank of America, Illinois, formerly Continental Bank, National Association (Filed as Exhibit 4 to Praxair, Inc.'s Current Report on Form 8-K dated March 19, 2007, Filing No. 1-11037, and incorporated herein by reference).
4.02	Form of Subordinated Indenture for Praxair, Inc. (Filed as Exhibit 4.3 to Praxair, Inc.'s Form S-3, filed on May 12, 2015, File No. 333-204093, and is incorporated herein by reference.)
4.03	Copies of the agreements relating to long-term debt which are not required to be filed as exhibits to this Annual Report on Form 10-K will be furnished to the Securities and Exchange Commission upon request.
10.01	Credit Agreement dated as of December 19, 2014 among Praxair, Inc. and the Eligible Subsidiaries Referred to therein, the Lenders listed therein, and Bank of America, N.A., as Administrative Agent,

	Citibank N.A., Deutsche Bank Securities Inc. and HSBC Securities (USA) Inc., as Syndication Agents was filed as Exhibit 10.1 to Praxair, Inc.'s current report on Form 8-K, dated December 22, 2014, Filing No. 1-11037, and is incorporated herein by reference.
10.01a	Waiver, dated as of June 22, 2018, to the Credit Agreement, dated as of December 19, 2014, as amended, among Praxair, Inc., the Eligible Subsidiaries party thereto from time to time, the lenders party thereto from time to time and Bank of America, N.A., as Administrative Agent (Filed as Exhibit 10.1 to Praxair, Inc.'s Quarterly Report on Form 10-Q for the second quarter of 2018, File No. 1-11037, and is incorporated herein by reference).

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10.02	Credit Agreement dated as of July 18, 2013 among Linde AG and Linde Finance B.V., as original borrowers, the Lenders listed therein, and Deutsche Bank Luxembourg S.A., as Agent and EUR Swingline Agent, Deutsche Bank AG, New York Branch, as USD Swingline Agent, and the several Lead Arrangers listed therein.
10.02a	Waiver, dated as of June 19, 2018, to the Credit Agreement dated as of July 18, 2013 among Linde AG and Linde Finance B.V., as original borrowers, the Lenders listed therein, and Deutsche Bank Luxembourg S.A., as Agent and EUR Swingline Agent, Deutsche Bank AG, New York Branch, as USD Swingline Agent, and the several Lead Arrangers listed therein.
*10.03	Long Term Incentive Plan 2018 of Linde plc (Filed as Exhibit 4.4 to the Company’s Form S-8, filed on October 31, 2018, File No. 333-228084, and incorporated herein by reference).
*10.04	Linde plc Annual Variable Compensation Plan effective January 1, 2019 (Filed as Exhibit 10.1 to the Company’s Current Report on Form 8-K, filed on January 25, 2019, File No. 1-38730, and is incorporated hereby by reference).
*10.05	Form of Executive Severance Compensation Agreement effective January 1, 2009 (Filed as Exhibit 10.02 to Praxair, Inc.'s 2008 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.05a	Form of Amendment, effective December 31, 2012, to Executive Severance Compensation Agreements that were effective January 1, 2009 (Filed as Exhibit 10.1 to Praxair, Inc.'s Current Report on Form 8-K dated December 14, 2012, Filing No. 1-11037, and incorporated herein by reference.
*10.05b	Form of Executive Severance Compensation Agreement effective January 1, 2010 (Filed as Exhibit 10.02 to Praxair, Inc.'s Quarterly Report on Form 10-Q for the quarter ended June 30, 2010, Filing No. 1-11037, and incorporated herein by reference).
*10.05c	Form of Amendment, effective December 31, 2012, to Executive Severance Compensation Agreements that were effective January 1, 2010 (Filed as Exhibit 10.02c to Praxair, Inc.'s 2012 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.05d	Form of Executive Severance Compensation Agreement effective January 1, 2013 (Filed as Exhibit 10.02d to Praxair, Inc.'s 2012 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.05e	Form of Assumption of Praxair, Inc. Executive Severance Compensation Agreement by Linde plc.
*10.06	Praxair, Inc. Supplemental Retirement Income Plan A effective January 1, 2008 (Filed as Exhibit 10.05a to Praxair, Inc.'s 2008 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.06a	First amendment to the Praxair, Inc. Supplemental Retirement Income Plan A effective January 1, 2010 (Filed as Exhibit 10.05b to Praxair, Inc.'s 2009 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.06b	Second Amendment to Praxair, Inc. Supplemental Retirement Income Plan A effective February 28, 2017, (Filed as Exhibit 10.05c to Praxair, Inc.'s 2016 Annual Report on Form 10-K, Filing No. 1-11037, and is incorporated hereby by reference).
*10.06c	Praxair, Inc. Supplemental Retirement Income Plan B amended and restated effective December 31, 2007 (Filed as Exhibit 10.05b to Praxair, Inc.'s 2008 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.06d	First amendment to the Praxair, Inc. Supplemental Retirement Income Plan B effective January 1, 2010 (Filed as Exhibit 10.05d to Praxair, Inc.'s 2009 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.06e	Second Amendment to Praxair, Inc. Supplemental Retirement Income Plan B effective July 1, 2012 (Filed as Exhibit 10.05e to Praxair Inc.’s 2012 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.06f	Third Amendment to Praxair, Inc. Supplemental Retirement Income Plan B effective February 28, 2017, (Filed as Exhibit 10.05g to Praxair, Inc.’s 2016 Annual Report on Form 10-K, Filing No. 1-11037, and is incorporated herein by reference).

*10.07	Praxair, Inc. Equalization Benefit Plan amended and restated effective December 31, 2007 (Filed as Exhibit 10.05c to Praxair, Inc.'s 2008 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.07a	First amendment to the Praxair, Inc. Equalization Benefit Plan effective January 1, 2010 (Filed as Exhibit 10.05f to Praxair Inc.'s 2009 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.07b	Second Amendment to the Praxair, Inc. Equalization Benefit Plan effective February 28, 2017,(Filed as Exhibit 10.05j to Praxair, Inc.'s 2016 Annual Report on Form 10-K, Filing No. 1-11037, and is incorporated herein by reference).

*10.07c	Third Amendment to the Praxair, Inc. Equalization Benefit Plan effective December 1, 2017 (Filed as Exhibit 10.05k to Praxair, Inc.'s 2017 Annual Report on Form 10-K, File No. 1-11037, and is incorporated herein by reference).
*10.07d	Fourth Amendment to the Praxair, Inc. Supplemental Retirement Income Plan B effective December 1, 2017 (Filed as Exhibit 10.05l to Praxair, Inc.'s 2017 Annual Report on Form 10-K, File No. 1-11037, and is incorporated herein by reference).
*10.07e	Third Amendment to the Praxair, Inc. Supplemental Retirement Income Plan A effective December 1, 2017 (Filed as Exhibit 10.05m to Praxair, Inc.'s 2017 Annual Report on Form 10-K, File No. 1-11037, and is incorporated herein by reference).
*10.07f	Praxair, Inc. 2018 Equalization Benefit Plan (Filed as Exhibit 99.1 to Praxair, Inc.'s Current Report on Form 8-K filed on October 22, 2018, File No. 1-11037, and incorporated herein by reference).
*10.07g	Praxair, Inc. 2018 Supplemental Retirement Income Plan A (Filed as Exhibit 99.2 to Praxair, Inc.'s Current Report on Form 8-K filed on October 22, 2018, File No. 1-11037, and incorporated herein by reference).
*10.07h	Praxair, Inc. 2018 Supplemental Retirement Income Plan B (Filed as Exhibit 99.3 to Praxair, Inc.'s Current Report on Form 8-K, filed October 22, 2018, File No. 1-11037, and incorporated herein by reference).
*10.08	Praxair, Inc. Director's Fees Deferral Plan amended and restated effective January 26, 2010 (Filed as Exhibit 10.06 to Praxair Inc.'s 2009 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.09	Praxair, Inc. Compensation Deferral Program Amended and Restated as of July 15, 2014 (Filed as Exhibit 10.01 to Praxair, Inc.'s Quarterly Report on Form 10-Q for the quarter ended September 30, 2014, Filing No. 1-11037, and incorporated herein by reference).
*10.09a	First Amendment to the Praxair Compensation Deferral Program effective February 28, 2017,(Filed as Exhibit 10.07a to Praxair, Inc.'s 2016 Annual Report on Form 10-K, Filing No. 1-11037, and is incorporated herein by reference).
*10.10	Service Credit Arrangement for Stephen F. Angel dated May 23, 2007 was filed as Exhibit 10.20 to Praxair, Inc.'s Form 8-K filed on May 24, 2007 and is incorporated herein by reference.
*10.11	Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan (Filed as Exhibit 4.03 to Praxair, Inc.'s Form S-8, filed on October 31, 2018, File No. 333-228084, and incorporated herein by reference).
*10.11a	Form of Standard Option Award under the 2009 Praxair, Inc. Long Term Incentive Plan (Filed as Exhibit 10.22 to Praxair, Inc.'s 2009 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.11b	Form of Transferable Option Award under the 2009 Praxair, Inc. Long Term Incentive Plan (Filed as Exhibit 10.23 to Praxair, Inc.'s 2009 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.11c	Form of Restricted Stock Unit Award under the 2009 Praxair, Inc. Long Term Incentive Plan (Filed as Exhibit 10.24 to Praxair, Inc.'s 2009 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).

*10.11d	First Amendment, dated as of April 25, 2017, to the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan (Filed as Exhibit 10.01 to Praxair, Inc.'s Quarterly Report on Form 10-Q for the quarter ended March 31, 2017, Filing No. 1-11037, and is incorporated herein by reference).
*10.11e	Form of Transferable Option Award under the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan for grants made in 2015-2017 (Filed as Exhibit 10.26 to Praxair, Inc.'s 2014 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.11f	Form of Transferable Option Award under the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan for grants made in 2018 (Filed as Exhibit 10.26a to Praxair, Inc.'s 2017 Annual Report on Form 10-K, File No. 1-11037, and incorporated herein by reference).
*10.11g	Form of Restricted Stock Unit Award under the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan for grants made in 2015 and thereafter (Filed as Exhibit 10.27 to Praxair, Inc.'s 2014 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.11h	Form of Restricted Stock Unit Award under the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan for grants made in 2018 (Filed as Exhibit 10.27a to Praxair, Inc.'s 2017 Annual Report on Form 10-K, File No. 1-11037, and incorporated herein by reference).
*10.11i	Form of Performance Share Unit Award under the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan for grants made in 2015 and thereafter with Earnings Per Share performance metrics (Filed as Exhibit 10.28A to Praxair, Inc.'s 2014 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.11j	Form of Performance Share Unit Award under the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan for grants made in 2016-2017 with Total Shareholder Return performance metrics (Filed as Exhibit 10.28C to Praxair, Inc.'s 2015 Annual Report on Form 10-K, Filing No. 1-11037, and incorporated herein by reference).
*10.11k	Form of Non-Employee Director Restricted Stock Unit Award under the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan (Filed as Exhibit 10.01 to Praxair, Inc.'s Quarterly Report on Form 10-Q for the quarter ended June 30, 2015, Filing No. 1-11037, and incorporated herein by reference.
*10.11l	Form of Transferable Option Award under the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan for grants beginning in 2019.
*10.11m	Form of Restricted Stock Unit Award under the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan for grants beginning in 2019.
*10.11n	Form of Performance Share Unit Award under the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan for grants beginning in 2019 with Return on Capital performance metrics.
*10.11o	Form of Performance Share Unit Award under the Amended and Restated 2009 Praxair, Inc. Long Term Incentive Plan for grants beginning in 2019 with Total Shareholder Return performance metrics.
*10.12	Separation Agreement and General Release dated April 6, 2018, by and between Praxair, Inc. and Scott Telesz, Executive Vice President of Praxair (Filed as Exhibit 10.01 to the Praxair, Inc.'s Quarterly Report on Form 10-Q for the quarter ended March 31, 2018, File No. 1-11037, and incorporated herein by reference).
*10.13a	Plan conditions 2015 Awards under the Linde AG 2012 Long Term Incentive Plan.
*10.13b	Plan conditions 2016 Awards under the Linde AG 2012 Long Term Incentive Plan.
*10.13c	Plan conditions 2017 Awards under the Linde AG 2012 Long Term Incentive Plan.
*10.13d	Form of First Amendment to the Plan Conditions under the Linde AG 2012 Long Term Incentive Plan.
*10.13e	Form of Second Amendment to the Plan Conditions under the Linde AG 2012 Long Term Incentive Plan.

*10.13f	Form of Award Agreement under the Linde AG 2012 Long Term Incentive Plan.
*10.14	Form of Employer-Funded Pension Plan Executive Agreement of Linde AG.
*10.15	Form of Linde AG Executive Employment Agreement.
*10.15a	Form of Change Control Appendix to Linde AG Executive Employment Agreement.
*10.16	Executive Employment Agreement by and between Linde AG and Mr. Sanjiv Lamba, dated March 9, 2011, as amended.

*10.17	Form of Linde plc Director Indemnification Agreement (Filed as Exhibit 10.1 to the Company's Current Report on Form 8-K, filed on October 31, 2018, File No. 333-218485, and incorporated herein by reference).
21.01	Subsidiaries of Linde plc
23.01	Consent of Independent Registered Public Accounting Firm.
31.01	Rule 13a-14(a) Certification
31.02	Rule 13a-14(a) Certification
32.01	Section 1350 Certification (such certifications are furnished for the information of the Commission and shall not be deemed incorporated by reference into any filing under the Securities Act or the Exchange Act).
32.02	Section 1350 Certification (such certifications are furnished for the information of the Commission and shall not be deemed incorporated by reference into any filing under the Securities Act or the Exchange Act).
101.INS	XBRL Instance Document
101.SCH	XBRL Taxonomy Extension Schema
101.CAL	XBRL Taxonomy Extension Calculation Linkbase
101.LAB	XBRL Taxonomy Extension Label Linkbase
101.PRE	XBRL Taxonomy Extension Presentation Linkbase
101.DEF	XBRL Taxonomy Extension Definition Linkbase

Copies of exhibits incorporated by reference can be obtained from the SEC and are located in SEC File No. 1-11037.

*	Indicates a management contract or compensatory plan or arrangement.
**	Certain schedules or similar attachments have been omitted pursuant to Item 601(b)(2) of Regulation S-K. The Registrant agrees to furnish supplemental copies of any of the omitted schedules or attachments upon request by the SEC.

ITEM 16. FORM 10-K SUMMARY

None.

SIGNATURES

Linde plc and Subsidiaries

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned thereunto duly authorized.

Linde plc
(Registrant)

Date: March 18, 2019 By: /s/ KELCEY E. HOYT

Kelcey E. Hoyt
Chief Accounting Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the Registrant and in the capacities indicated on March 18, 2019.

/s/ PROF. DR. WOLFGANG REITZLE	/s/ STEPHEN F. ANGEL	/s/ MATTHEW J. WHITE
Wolfgang Reitzle *Chairman*	**Stephen F. Angel** *Chief Executive Officer and Director*	**Matthew J. White** *Chief Financial Officer*
/s/ PROF. DDR. ANN-KRISTIN ACHLIETNER	/s/ DR. CLEMENS BÖRSIG	/s/ DR. NANCE K. DICCIANI
Ann-Kristin Achleitner *Director*	**Clemens Börsig** *Director*	**Nance K. Dicciani** *Director*
/s/ DR. THOMAS ENDERS	/s/ FRANZ FEHRENBACH	/s/ EDWARD G. GALANTE
Thomas Enders *Director*	**Franz Fehrenbach** *Director*	**Edward G. Galante** *Director*
/s/ LARRY D. MCVAY	/s/ DR. VICTORIA OSSADNIK	/s/ PROF. DR. MARTIN H. RICHENHAGEN
Larry D. McVay *Director*	**Victoria Ossadnik** *Director*	**Martin Richenhagen** *Director*
/s/ ROBERT L. WOOD		
Robert L. Wood *Director*		

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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

FORM 10-K

☑ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the fiscal year ended December 31, 2017

OR

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from to

LINDE PLC

(Exact name of registrant as specified in its charter)

Ireland
(State or other jurisdiction of incorporation)

333-218485	**Not Applicable**
(Commission File Number)	**(IRS Employer Identification No.)**

**The Priestley Centre, 10 Priestley Road,
Surrey Research Park, Guildford, Surrey GU2 7XY United Kingdom**

	+44 1483 242200
(Address of principal executive offices)	**Registrant's Telephone Number, Including Area Code**

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☐ No ☑

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes ☑ No ☐

Indicate by check mark whether the Registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the Registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☐ No ☐

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§229.405 of this chapter) is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. ☑

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes ☑ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer	☐	Accelerated filer	☐
Non-accelerated filer	☑	Smaller reporting company	☐
		Emerging growth company	☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the Registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ☑ No ☐

All of the voting stock of the registrant is held by an affiliate of the registrant. There is no publicly traded market for any class of voting stock of the registrant.

At March 23, 2018, 25,000 A ordinary shares of €1.00 each of the Registrant were outstanding.

Explanatory Note

Linde plc's duty to file reports under Section 15 of the Securities Exchange Act of 1934 (the "Exchange Act") has automatically been suspended pursuant to Section 15(d)(1) of the Exchange Act as of January 1, 2018, because Linde plc's ordinary shares, nominal value €0.001 per share, have not yet been issued and as such are held of record by fewer than 300 persons. Linde plc files this Annual Report on Form 10-K in compliance with guidance of the Securities and Exchange Commission and has filed all reports required to be filed by Section 13 or 15(d) of the Exchange Act during the preceding 12 months (or for such shorter period that the Registrant was required to file such reports). The business combination between Praxair, Inc. and Linde AG is expected to be completed and Linde plc's ordinary shares, nominal value €0.001 per share, to be issued in the second half of 2018.

Linde plc

ANNUAL REPORT ON FORM 10-K
For the fiscal year ended December 31, 2017

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PART I

Item 1. Business

Linde plc, formerly known as Zamalight plc ("Linde plc" or the “Company”), was incorporated as a public limited company under the laws of Ireland on April 18, 2017, by Enceladus Holding Limited ("Enceladus") and Cumberland Corporate Services Limited ("Cumberland"). Zamalight plc was renamed "Linde plc" on July 20, 2017. The Company is registered in Ireland under the registration number 602527 and with its registered office located at Ten Earlsfort Terrace, Dublin 2, D02 T380 Ireland and principal executive offices at The Priestley Centre, 10 Priestley Road, The Surrey Research Park, Guildford, Surrey GU2 7XY, United Kingdom. The Company’s fiscal year ended on December 31, 2017.

The Company was formed in accordance with the requirements of the business combination agreement, dated as of June 1, 2017, as amended (the "business combination agreement"), pursuant to which, among other things, Praxair, Inc. (together with its subsidiaries, “Praxair”) and Linde AG (together with its subsidiaries, “Linde”) agreed to combine their respective businesses through an all-stock transaction, and become subsidiaries of the Company.

In connection with the proposed business combination, Linde plc filed a Registration Statement on Form S-4 ("the registration statement") which was declared effective by the U. S. Securities and Exchange Commission ("SEC") on August 14, 2017. Linde plc also filed an offer document with the German Federal Financial Supervisory Authority (*Bundesanstalt fuer Finanzdienstleistungsaufsicht*) (“BaFin”) which was approved for publication by BaFin on August 14, 2017 and published by Linde plc on August 15, 2017 (the "offer document"). Pursuant to the offer document, Linde plc made an offer to exchange each issued and outstanding no-par value bearer share of Linde AG for 1.540 ordinary shares of Linde plc (the “exchange offer”). In addition, upon completion of the exchange offer, Zamalight Subco, Inc., an indirect wholly-owned Delaware subsidiary of Linde plc, will merge with and into Praxair, Inc., with Praxair, Inc. surviving the merger (the “merger”, and together with the exchange offer, the “business combination”). In the merger, each share of Praxair, Inc. common stock will be converted into the right to receive one Linde plc ordinary share. Praxair, Inc.’s stockholders approved the merger at Praxair, Inc.’s special meeting held on September 27, 2017, and on November 24, 2017, the tender period for the exchange offer expired with approximately 92% of all Linde AG shares entitled to voting rights being tendered. The parties currently expect the business combination to be completed in the second half of 2018. Upon completion of the business combination, Linde plc will apply to list its ordinary shares on the New York Stock Exchange and the Frankfurt Stock Exchange, and will seek inclusion in the S&P 500 and DAX 30 indices.

To date, the Company has not conducted any material activities other than those incidental to its formation and the matters contemplated by the business combination agreement such as the incurrence of SEC registration fees and other transaction-related costs. For additional information related to the business combination agreement, please refer to Note 1 to the consolidated financial statements included in this annual report on Form 10-K (the “Form 10-K”) and to the registration statement.

In addition, the public may read and copy any materials filed with the SEC at the SEC’s Public Reference Room located at 100 F Street NE, Washington, D.C. 20549. The public may also obtain information on the operation of the Public Reference Room by calling the SEC at 1-800-SEC-0330. The SEC also maintains a website, www.sec.gov, that contains reports, proxy information statements and other information regarding issuers that file electronically.

Item 1A. Risk Factors

To date, the Company has not conducted any material activities other than those incidental to its formation and the matters contemplated by the business combination agreement. Important risk factors that could impact Linde plc’s future operations, financial performance and the trading prices of its common shares are presented below. The following risk factors should be read in conjunction with discussions of Linde plc’s activities located elsewhere in this Form 10-K and the risk factors, including risks related to Praxair’s and Linde’s businesses, included or incorporated by reference into Linde plc’s subsequent filings with the SEC.

Linde plc, Praxair and Linde must obtain governmental and regulatory approvals to consummate the business combination, which could delay the completion of the business combination or, if not granted, would result in a

termination of the business combination. In addition, conditions imposed by such agencies in connection with their approvals may adversely impact the business, financial condition or results of operations of the combined group.

Completion of the business combination remains conditioned upon regulatory approval or expiration or termination of statutory waiting periods (including extensions thereof) under merger control or competition law regimes in the United States (including CFIUS approval), the European Union, Brazil, Canada, China, India, Mexico, and South Korea. In addition, regulatory approvals have been solicited and filings made in other jurisdictions in which the parties mutually agreed antitrust filings to be necessary. The relevant agencies have commenced or may commence in-depth investigations, may impose requirements, limitations or costs or require divestitures or place restrictions on the conduct of Linde plc's, Praxair's and Linde AG's respective businesses. For example, on February 16, 2018, the European Commission initiated a Phase II review of the proposed business combination and on August 31, 2017, Praxair, Inc. and Linde AG entered into timing agreements with the United States Federal Trade Commission (the "FTC"). In accordance with such timing agreements, the proposed business combination will not close before 12:01 a.m. Eastern Time on the 120th calendar day following the date on which Praxair and Linde AG provide written notice to the FTC of their intention to close, unless they have received prior notice that the FTC has closed its investigation. While timing agreements with the FTC and a Phase II review by the European Commission are customary in large transactions of this nature and the companies are continuing to work closely and cooperatively with regulators, any delay for regulatory reasons could diminish the anticipated benefits of the business combination or result in additional transaction costs. No assurance can be given that the required approvals will be obtained or that the required conditions to the business combination will be satisfied, and if they are, as to the terms, conditions and timing of the approvals. If the requisite regulatory approvals have not been obtained by October 24, 2018, the business combination agreement will terminate.

Conditions imposed by regulatory agencies in connection with their approval of the business combination may require changes to the operations of Linde plc, Praxair and/or Linde, restrict their ability to operate in certain jurisdictions following the business combination, restrict the combination of Praxair's and Linde's operations in certain jurisdictions or require other commitments regarding ongoing operations. Such conditions may also restrict Linde plc's, Praxair's and/or Linde's ability to modify the operations of their businesses in response to changing circumstances for a period of time after completion of the business combination or their ability to expend cash for other uses or otherwise have an adverse effect on the anticipated benefits of the business combination, thereby adversely impacting the business, financial condition or results of operations of Linde plc, Praxair and Linde. The companies currently expect to divest certain assets in order to obtain certain regulatory approvals, which may result in loss of value due to the loss of those assets or businesses or a sale of those assets or businesses at less than the desired price or under otherwise unfavorable conditions, in particular as a result of timing constraints and the limited universe of buyers acceptable to the regulatory authorities, especially in challenging market conditions. The business combination agreement contemplates certain revenue and EBITDA thresholds with respect to such potential divestitures. The companies may also make certain other commitments regarding ongoing operations in certain jurisdictions in response to regulatory requirements. Linde plc, Praxair and Linde may not be successful in obtaining all required regulatory approvals, and if they are, any restrictions, requirements or conditions imposed by regulators could have a material adverse effect on the business, results of operations, financial condition and prospects of Linde plc and reduce substantially or eliminate the synergies and cost reductions and the advantages which Linde plc, Praxair and Linde expect to achieve from the business combination.

In addition, the business combination agreement, or certain covenants therein, may be terminated for, or may terminate as a result of, certain reasons, including, among others, a permanent injunction or order by any governmental entity in Ireland, the United Kingdom, Germany or the United States that prohibits or makes illegal the completion of the business combination, the occurrence of a change, event, occurrence or effect that has had or is reasonably expected to have a "material adverse change" (as defined in the business combination agreement) on Linde AG or Praxair, Inc. or the failure to obtain approval by requisite governmental regulators and authorities described in the preceding paragraph. No assurance can be given that no event giving rise to termination of the business combination agreement will occur.

Because the exchange ratios in the merger and the exchange offer are fixed, the market value of the Linde plc shares received by Praxair shareholders in the merger or by Linde AG shareholders in the exchange offer may be less than the market value of the Praxair or Linde AG shares that such holder held prior to the completion of the business combination.

Praxair shareholders will receive one Linde plc share for each of their Praxair shares in the merger and Linde AG shareholders who tendered their Linde AG shares in the exchange offer will receive 1.540 Linde plc shares for each Linde AG share tendered and not withdrawn. These exchange ratios are fixed and will not vary even if the market price of Praxair shares or Linde AG shares varies. The market value of Praxair shares and Linde AG shares at the time of the completion of the business combination may vary significantly from the value on the date of the execution of the business combination agreement, the date of this document, the date on which Praxair shareholders voted on the merger, the date on which Linde AG shareholders tendered their shares in the exchange offer or the expiration of the acceptance period. Because the exchange ratios will not be adjusted to reflect any changes in the market price of the Praxair shares or Linde AG shares, the value of the consideration paid to the Praxair shareholders in the merger or to the Linde AG shareholders who tendered their shares in the exchange offer may be lower than the market value of their Praxair or Linde AG shares, respectively, on earlier dates.

Changes in share prices may result from a variety of factors that are beyond the control of Linde plc, Praxair and Linde, including their respective business, operations and prospects, market conditions, economic development, geopolitical events, regulatory considerations, governmental actions, legal proceedings and other developments. Market assessments of the benefits of the business combination and of the likelihood that the business combination will be completed, as well as general and industry-specific market and economic conditions, may also have an adverse effect on share prices.

The pendency of the business combination, during which Praxair and Linde are subject to certain operating restrictions, could have an adverse effect on Linde plc's, Praxair's and Linde's businesses and cash flows, financial condition and results of operations.

The pendency of the business combination could disrupt Praxair's and Linde's businesses, and uncertainty about the effect of the business combination may have an adverse effect on Linde plc, Praxair and Linde. These uncertainties could cause suppliers, vendors, partners, customers and others that deal with Praxair and Linde to defer entering into contracts with, or making other decisions concerning, Praxair and Linde or to seek to change or cancel existing business relationships with the companies. In addition, Praxair's and Linde's employees may experience uncertainty regarding their roles after the business combination. Employees may depart either before or after the completion of the business combination because of uncertainty and issues relating to the difficulty of coordination or because of a desire not to remain following the business combination. Therefore, the pendency of the business combination may adversely affect Linde plc's, Praxair's and Linde's ability to retain, recruit and motivate key personnel. Additionally, the attention of Praxair's and Linde's management may be directed towards the completion of the business combination, including obtaining regulatory approvals, and may be diverted from the day-to-day business operations of Praxair and Linde. Matters related to the business combination may require commitments of time and resources that could otherwise have been devoted to other opportunities that might have been beneficial to Praxair and Linde. Additionally, the business combination agreement requires Praxair and Linde to refrain from taking certain specified actions, for example significant investments or disposals, while the business combination is pending (except those necessary in connection with obtaining regulatory approvals). These restrictions may prevent Praxair and Linde from pursuing otherwise attractive business opportunities or capital structure alternatives and from executing certain business strategies prior to the completion of the business combination. Further, the business combination may give rise to potential liabilities, including those that may result from pending and future shareholder lawsuits relating to the business combination or a post-completion reorganization. Any of these matters could adversely affect the businesses of, or harm the results of operations, financial condition or cash flows of Linde plc, Praxair and Linde.

Further, certain adverse changes in the business of Linde or Praxair in the period prior to the closing of the business combination may occur that would not result in Praxair, Linde or Linde plc having the right to terminate the business combination agreement, or certain covenants therein. If adverse changes occur but Praxair and Linde are still required to complete the business combination, the market value of Praxair shares, Linde AG shares or Linde plc shares may decrease. If the business combination is not completed, these risks may still materialize and materially adversely affect the business and financial results of Linde plc.

Negative publicity related to the business combination may materially adversely affect Linde plc, Praxair and Linde.

From time to time, political and public sentiment in connection with a business combination may result in a significant amount of adverse press coverage and other adverse public statements affecting the parties to the business combination. Adverse press coverage and public statements, whether or not driven by political or popular sentiment, may also result in legal claims or in investigations by regulators, legislators and law enforcement officials. Responding to these investigations and lawsuits, regardless of the ultimate outcome of the proceedings, can divert the time and effort of senior management from operating their businesses. Addressing any adverse publicity, governmental scrutiny or enforcement or other legal proceedings could be time-consuming and expensive and, regardless of the factual basis for the assertions being made, could have a negative impact on the reputation of Linde plc, Praxair and Linde, on the morale and performance of their employees and on their relationships with regulators, suppliers and customers. It may also have a negative impact on their ability to take timely advantage of various business and market opportunities. The direct and indirect effects of negative publicity, and the demands of responding to and addressing it, may have a material adverse effect on Linde plc's, Praxair's and Linde's respective business and cash flows, financial condition and results of operations

Upon completion of the business combination, certain change-of-control rights under material agreements may be triggered.

Praxair and Linde are parties to agreements that contain change-of-control provisions that may be triggered upon completion of the business combination. Upon the triggering of these change-of-control provisions, the counterparties to the agreement may be able to exercise certain rights that have a negative effect on Praxair, Linde or, after the business combination, Linde plc. For example, the terms of Linde's approximately €8.5 billion notes outstanding include change of control clauses triggered by a change of control of Linde AG and a resulting below investment grade ratings downgrade of Linde AG's corporate and debt ratings. In addition, Linde's €2.5 billion undrawn syndicated credit facility and Praxair's $2.5 billion credit facility each include a change of control clause relating to a change of control of Linde AG and Praxair, Inc., respectively. If parties to agreements with change-of-control provisions exercise such rights, contracts that are beneficial to Linde or Praxair may be terminated which may have an adverse effect on the business, the cash flows and the financial condition and results of operations of Linde plc, Praxair and Linde.

The business combination triggered a mandatory takeover offer with respect to Linde's listed local subsidiary in India, and may require such mandatory takeover offers in other jurisdictions.

The completion of the business combination will result in Linde plc acquiring indirect control of Linde's subsidiaries listed on local stock exchanges. Should relevant conditions under local laws of individual jurisdictions be met and if an exemption is not available or granted under the respective regulations, the business combination may trigger the obligation to make a public offer with respect to the outstanding shares in certain of Linde's subsidiaries that are publicly listed. To the extent that Linde plc is unable to obtain any applicable exemption, potentially costly and complex takeover procedures may have to be conducted. In addition, the granting of any applicable exemption may depend on the discretion of the competent authority and may also depend on the competent authority's interpretation of the applicable laws and regulations, including the need for any application for any such exemption. No assurance can be provided that the respective competent authorities will grant the requested exemptions or will confirm that no mandatory takeover offers with respect to any such listed subsidiaries will be required as a result of the transaction, even if such authority may have granted exemptions for similar transactions in the past. Accordingly, the business combination will require such a mandatory takeover offer in India, subject to and following the completion of the business combination, and may require such mandatory takeover offers in other jurisdictions, which would result in additional transaction costs and complexity.

Praxair and Linde have incurred and will continue to incur significant transaction fees and costs in connection with the business combination.

Praxair and Linde expect to continue to incur a number of significant non-recurring implementation and restructuring costs associated with combining the operations of the two companies. In addition, Praxair and Linde will incur significant banking, legal, accounting and other transaction fees and costs related to the business combination. Additional costs substantially in excess of currently anticipated costs may also be incurred in connection with the integration of the businesses of Praxair and Linde.

Any cost savings or other efficiencies related to the integration of the businesses that could offset these transaction- and combination-related costs over time may not be achieved in the near term, or at all. In addition, the timeline in which cost savings are expected to be realized is lengthy and may not be achieved. Failure to realize these synergies and cost reductions and other efficiencies in a timely manner or at all could have a material adverse effect on Linde plc's, Praxair's and Linde's respective businesses and cash flows, financial condition and results of operations.

Linde plc may fail to realize the anticipated strategic and financial benefits sought from the business combination.

Linde plc may not realize all of the anticipated benefits of the business combination. The success of the business combination will depend on, among other things, Linde plc's ability to combine Praxair's business with Linde's business in a manner that facilitates growth and realizes anticipated cost savings. In addition, the actual integration of Praxair and Linde will involve complex operational, technological and personnel-related challenges. This process will be time-consuming and expensive, and it may be disruptive to the combined businesses. Linde plc may not realize all of the anticipated benefits of the business combination. Difficulties in the integration of the businesses, which may result in significant costs and delays, include:

- managing a significantly larger combined group;
- aligning and executing the strategy of the combined group;
- integrating and unifying the offerings and services available to customers and coordinating distribution and marketing efforts in geographically separate organizations;

- coordinating corporate and administrative infrastructures and aligning insurance coverage;
- coordinating accounting, information technology, communications, administration and other systems;
- addressing possible differences in corporate cultures and management philosophies;
- the combined group becoming subject to Irish laws and regulations and legal action in Ireland;
- coordinating the compliance program and creating uniform financial reporting, information technology and other standards, controls, procedures and policies;

- the implementation, ultimate impact and outcome of potential post-completion reorganization transactions, which may be delayed or not take effect as a result of litigation or otherwise;
- unforeseen and unexpected liabilities related to the business combination or Linde plc's business;
- managing tax costs or inefficiencies associated with integrating the operations of the combined group;
- identifying and eliminating redundant and underperforming functions and assets;
- effecting actions that may be required in connection with obtaining regulatory approvals; and
- a deterioration of credit ratings.

These and other factors could result in increased costs and diversion of management's time and energy, as well as decreases in the amount of expected revenue and earnings, which could materially impact Linde plc's business, financial condition and results of operations. The integration process and other disruptions resulting from the business combination may also adversely affect Linde plc's relationships with employees, suppliers, customers, distributors, licensors and others with whom Praxair and Linde have business or other dealings, and difficulties in integrating the businesses of Praxair and Linde could harm the reputation of the combined group.

If the combined group is not able to successfully combine the businesses of Praxair and Linde in an efficient, cost-effective and timely manner, the anticipated benefits and cost savings of the business combination may not be realized fully, or at all, or may take longer to realize than expected.

Linde plc intends to implement certain post-closing reorganization transactions with respect to Linde AG. If the effectiveness of such transactions is delayed as a result of litigation or otherwise or does not occur, this may have an adverse effect on the ability to realize synergies and cost reductions and on the market value of Linde plc shares.

Following completion of the business combination, Linde AG will be an indirect subsidiary of Linde plc and, thus, a dependent company within the meaning of Section 17 of the German Stock Corporation Act. The legal framework for this dependency between Linde plc and Linde AG is, subject to other applicable law, set forth in Sections 311 *et seq.* of the German Stock Corporation Act, which may prevent or impede the realization of synergies and cost reductions absent certain post-closing reorganization transactions, which may include a domination agreement or a cash merger squeeze-out under German law. If the effectiveness of such transactions is delayed as a result of litigation or otherwise or does not occur, Linde plc may be unable to initiate any transactions or measures that are disadvantageous to Linde AG, unless Linde plc provides adequate compensation to Linde AG, which may preclude Linde plc from implementing certain transactions related to the integration of Linde into the combined group, including realizing synergies. The failure to realize synergies may lead to a decline of the market value of Linde plc shares.

Linde plc may experience a loss of customers or may fail to win new customers in certain countries.

Following the completion of the business combination, third parties with whom Praxair or Linde had relationships prior to the announcement of the business combination may terminate or otherwise reduce the scope of their relationship with either party in anticipation or after the completion of the business combination. In addition, the combined group may face difficulties to acquire new customers in certain countries. Any such loss of business or the inability to win new customers could limit the combined group's ability to achieve the anticipated benefits of the business combination. Such risks could also be exacerbated by a delay in the settlement of the exchange offer and the business combination.

Linde plc may be unable to retain and motivate Praxair and/or Linde personnel successfully.

The success of the business combination will depend, in part, on Linde plc's ability to retain the talents and dedication of key employees, including key decision-makers, currently employed by Praxair and Linde. Such employees may decide not to remain with Praxair and Linde, as applicable, while the business combination is pending or with the combined group after the business combination is completed. If key employees terminate their employment, or if an insufficient number of employees are retained to maintain effective operations, the combined group's business activities may be adversely affected and management's attention may be diverted from successfully integrating Praxair and Linde to hiring suitable replacements, all of which may cause Linde plc's business to deteriorate. Praxair and Linde may not be able to locate suitable replacements for any key employees who leave either company, or offer employment to potential replacements on reasonable terms. In addition, Linde plc, Praxair and Linde may not be able to motivate certain key employees following the completion of the business combination due to organizational changes, reassignments of responsibilities, the perceived lack of appropriate opportunities for advancement or other reasons. If the combined group fails to successfully retain and motivate the employees of Praxair and/or Linde, relevant capabilities and expertise may be lost which may have an adverse effect on the cash flows and the financial condition and results of operations of Linde plc, Praxair and Linde.

A change in Linde plc's tax residency could have a negative effect on Linde plc's future profitability, and may trigger taxes on dividends or exit charges.

Linde plc intends to continue to manage its affairs so that it is centrally managed and controlled in, and effectively managed from, the United Kingdom and therefore has its tax residency only in the United Kingdom. However, we cannot assure you that Linde plc is or will continue to be resident only in the United Kingdom for tax purposes.

Under current Irish legislation, an Irish incorporated company will be considered Irish tax resident except where it is tax resident in a territory with which Ireland has a double tax treaty, under the terms of the double tax treaty. Under current U.K. legislation, a company that is centrally managed and controlled in the United Kingdom is regarded as resident in the United Kingdom for taxation purposes unless it is treated as resident in another jurisdiction pursuant to any appropriate double tax treaty with the United Kingdom. Other jurisdictions may also seek to assert taxing jurisdiction over Linde plc. For example, a company is subject to German taxation on its worldwide income if it has either its registered seat or place of effective management and control in Germany. This is a question of fact and needs to be determined on an overall assessment of the actual circumstances. Where a company is treated as tax resident under the domestic laws of both the United Kingdom and Ireland, article 4(3) of the Double Tax Convention between Ireland and the United Kingdom (the "residence tie-breaker") currently provides that the company shall be treated as resident only in one of those two jurisdictions if its place of effective management is situated there. A similar situation would exist if Linde plc was treated as a tax resident under the domestic laws of both the United Kingdom and Germany, or of Ireland and Germany.

The Organisation for Economic Co-operation and Development has proposed a number of measures relating to the tax treatment of multinationals, some of which are to be implemented by amending double tax treaties through a multilateral instrument ("MLI"). The MLI has been signed by a number of countries, including Germany, Ireland and the United Kingdom. The MLI allows signatories to opt into or out of certain changes: the effect for a given double tax convention depends on the options chosen by the two contracting states. Ireland and the United Kingdom have indicated they intend to change the residence tie-breaker so that it will depend on a ruling by the "competent authorities" (that is, the tax authorities) of the two contracting states, instead of an objective application of the place of effective management test. Accordingly, if Ireland and the United Kingdom maintain their position and enough countries ratify the MLI, the residence tie-breaker would be amended to depend on a determination by Irish Revenue Commissioners and HM Revenue and Customs. It is not certain when this will take place nor what factors will be taken into account in making the determination, but Linde plc does not expect such a determination to alter its tax residency.

It is possible that in the future, whether as a result of a change in law (including the entry into force of the MLI or a change to the intention of Germany, Ireland or the United Kingdom in relation to the MLI) or the practice of any relevant tax authority or as a result of any change in the conduct of Linde plc's affairs, Linde plc could become, or be regarded as having become, resident in a jurisdiction other than the United Kingdom. If Linde plc ceases to be resident in the United Kingdom and becomes resident in another jurisdiction, it may be subject to U.K. exit charges, and could become liable for additional tax charges in the other jurisdiction (including, by way of example, dividend withholding taxes or corporate income tax charges). If Linde plc were to be treated as resident in more than one jurisdiction, it could be subject to multiple taxation. If, for example, Linde plc were considered to be a tax resident of Ireland, Linde plc could become liable for Irish corporation tax and any dividends paid by it could be subject to Irish dividend withholding tax. If Linde plc were to be treated as tax resident in Germany, it would become liable for German corporate income tax on its worldwide income and trade tax on its income allocable to its German business, and dividends paid by Linde plc to its shareholders could be subject to German dividend withholding tax, and such tax may not be fully creditable or refundable under a double tax convention or the domestic rules of a shareholder.

The relevant criteria for Linde plc's treatment as a foreign corporation for U.S. federal tax purposes may not be met, or the IRS may not agree with the conclusion that Linde plc should be treated as such.

Although Linde plc is incorporated in Ireland, the U.S. Internal Revenue Service (the "IRS") may assert that Linde plc should be treated as a U.S. corporation (and, therefore, a U.S. tax resident) for U.S. federal income tax purposes pursuant to Section 7874 of the U.S. Internal Revenue Code of 1986, as amended (the "Code"). Further, changes to Section 7874 of the Code or the U.S. Treasury Regulations promulgated thereunder, or interpretations thereof, could affect Linde plc's status as a foreign corporation.

For U.S. federal income tax purposes, a corporation is generally considered a U.S. "domestic" corporation (or U.S. tax resident) if it is organized in the United States, and a corporation is generally considered a "foreign" corporation (or non-U.S. tax resident) if it is not a U.S. domestic corporation. Because Linde plc is an entity incorporated in Ireland, it would generally be classified as a foreign corporation (or non-U.S. tax resident) under these rules. However, Code Section 7874 provides an exception under which a foreign incorporated entity may, in certain circumstances, be treated as a U.S. domestic corporation for U.S. federal income tax purposes.

Unless Linde plc has satisfied the substantial business activities exception, as defined in Section 7874 and described in more detail below (the "Substantial Business Activities Exception"), Linde plc would be treated as a U.S. domestic corporation (*i.e.*, as a U.S. tax resident) for U.S. federal income tax purposes under Code Section 7874 if the percentage (by vote or value) of Linde plc shares considered to be held by former holders of Praxair shares after the merger by reason of holding Praxair shares for purposes of Code Section 7874 (the "Section 7874 Percentage") is 60% or more (if, as expected, the "Third Country Rule" applies; under the Third Country Rule, if (i) there is an acquisition of a domestic company by a foreign acquiring company in which the Section 7874 Percentage is at least 60% (reduced from the general 80% threshold otherwise applicable under Section 7874 of the Code and the U.S. Treasury Regulations promulgated thereunder), and (ii) in a related acquisition, such foreign acquiring company acquires another foreign corporation and the foreign acquiring company is not subject to tax as a resident in the foreign country in which the acquired foreign corporation was subject to tax as a resident prior to the merger, then the foreign acquiring company will be treated as a U.S. domestic corporation for U.S. federal income tax purposes). In order for Linde plc to satisfy the Substantial Business Activities Exception, at least 25% of the employees (by headcount and compensation), real and tangible assets and gross income of the Linde plc expanded affiliated group must be based, located and derived, respectively, in the country in which Linde plc is a tax resident after the merger. The Substantial Business Activities Exception is not expected to be satisfied.

The Section 7874 Percentage is currently expected to be less than 60%. However, the calculation of the Section 7874 Percentage is complex, is calculated based on the facts as of the effective time of the merger, is subject to detailed regulations (the application of which is uncertain in various respects and would be impacted by changes in such regulations) and is subject to factual uncertainties (including fluctuations in the value of Praxair shares, and therefore in the value of Linde plc shares, as of the effective time of the merger). As a result, the IRS could assert that the Section 7874 Percentage is greater than or equal to 60% and that Linde plc therefore is treated for U.S. federal income tax purposes as a U.S. domestic corporation (*i.e.*, as a U.S. tax resident). If the IRS successfully challenges Linde plc's status as a foreign corporation, significant adverse tax consequences would result for Linde plc, the combined group and for certain of Linde plc's stockholders.

Linde plc is not currently expected to be treated as a domestic corporation, but it is possible that changes in U.S. federal income tax law could alter that result.

Transfers of Linde plc ordinary shares may be subject to Irish stamp duty.

For the majority of transfers of Linde plc shares, there will not be any Irish stamp duty. However, Irish stamp duty will become payable in respect of certain share transfers occurring after completion of the business combination. A transfer of Linde plc shares from a seller who holds shares beneficially (*i.e.* through DTC or Clearstream) to a buyer who holds the acquired shares beneficially will not be subject to Irish stamp duty (unless the transfer involves a change in the nominee that is the record holder of the transferred shares). A transfer of Linde plc shares by a seller who holds shares directly (*i.e.* not through DTC or Clearstream) to any buyer, or by a seller who holds the shares beneficially to a buyer who holds the acquired shares directly, may be subject to Irish stamp duty (currently at the rate of 1% of the price paid or the market value of the shares acquired, if higher) payable by the buyer. A shareholder who directly holds shares may transfer those shares into his or her own broker account to be held through DTC/Clearstream (or vice versa) without giving rise to Irish stamp duty provided that the shareholder has confirmed to Linde plc's transfer agent that there is no change in the ultimate beneficial ownership of the shares as a result of the transfer and the transfer is not in contemplation of a sale of the shares.

Because of the potential Irish stamp duty on transfers of Linde plc shares, directly registered Praxair shareholders may face disadvantages if they do not open broker accounts and do not transfer their shares into such accounts as soon as possible, and in any event prior to completion of the business combination. Any person who wishes to acquire Linde plc shares after completion of the business combination may face disadvantages if they do not acquire such shares through DTC or Clearstream.

Changes in tax laws and policy could adversely impact Linde plc's financial position or results of operations.

Linde plc, Praxair and Linde are subject to the tax rules and regulations in the U.S., Germany, Ireland, the U.K. and other countries in which Linde plc, Praxair and Linde and their affiliates operate. Such tax rules and regulations are subject to change on a prospective or retroactive basis. Under current economic and political conditions, including the referendum in June 2016 in the U.K. in which voters approved an exit from the EU and the ongoing exit process, tax rates and policies in any jurisdiction, including the U.S., the U.K. and EU, are subject to significant change. In particular, since Linde plc is expected to be treated as U.K. tax resident, any potential changes in the tax rules applying to U.K. tax-resident companies would directly affect Linde plc.

When tax rules change, this may result in a higher tax expense and the need to make higher tax payments. In addition, changes in tax legislation may have a significant impact on Linde plc's, Praxair's and Linde's tax receivables and tax liabilities as well as on their deferred tax assets and deferred tax liabilities. Moreover, uncertainty about the tax environment in some regions may restrict Linde plc's, Praxair's or Linde's opportunities to enforce their respective rights under the law. Companies in the combined group will also operate in countries with complex tax regulations which could be interpreted in different ways. Interpretations of these regulations or changes in the tax system might have an adverse impact on the tax liabilities, profitability and business operations of Praxair, Linde or the combined group. Linde plc, Praxair, Inc. and Linde AG and their respective subsidiaries are subject to periodic audits by the tax authorities in various jurisdictions or other review actions by the relevant financial or tax authorities. The ultimate tax outcome may differ from the amounts recorded in Linde plc's, Praxair's and Linde's financial statements and may materially affect their respective financial results for the period when such determination is made.

In the current environment, the U.S. Congress, the European Union, the Organisation for Economic Co-operation and Development and other government agencies in jurisdictions where Linde plc and its affiliates do business have had an extended focus on issues related to the taxation of multinational corporations. One area of focus has been "base erosion and profit shifting," including situations where payments are made between affiliates from a jurisdiction with high tax rates to a jurisdiction with lower tax rates. However, the prospect of any reform with respect to these issues remains highly uncertain. Any such changes, among other possible changes in applicable tax rules and regulations, could affect the treatment of Linde plc, Praxair, Linde, or their respective affiliates or shareholders significantly. Additionally, on December 22, 2017, tax reform legislation was enacted in the United States. This legislation made significant changes to the U.S. Internal Revenue Code that are are highly complex and unclear and there is limited guidance regarding their application. The overall impact of this legislation also depends on the future interpretations and regulations that may be issued by U.S. tax authorities.

There has been no prior public market for Linde plc shares, and the market price of Linde plc shares may be volatile.

Linde plc will list the Linde plc shares on the NYSE and the Frankfurt Stock Exchange. It is not expected, but cannot be entirely excluded that an active public market for Linde plc shares may not develop or be sustained after the completion of the business combination. Linde plc cannot predict the extent to which a trading market will develop or how liquid that market might become.

The market price of Linde plc shares may be volatile. Broad general economic, political, market and industry factors may adversely affect the market price of Linde plc shares, regardless of Linde plc's actual operating performance. Factors that could cause fluctuations in the price of Linde plc shares may include, among other things:

- actual or anticipated variations in operating results and the results of competitors;
- changes in financial estimates by Linde plc or by any securities analysts that might cover Linde plc shares;
- conditions or trends in the industry, including regulatory changes;
- announcements by Linde plc or its competitors of significant acquisitions, strategic partnerships or divestitures;
- announcements of investigations or regulatory scrutiny of Linde plc's operations or lawsuits filed against it;
- additions or departures of key personnel; and
- issues or sales of Linde plc shares, including sales of shares by its directors and officers or its strategic investors.

Shareholders of Linde plc may lose parts of or their entire investment, if the market price of Linde plc shares falls due to one or several of the described factors.

Any dividend paid in respect of Linde plc shares is subject to a number of factors, including the distributions of earnings to Linde plc by its subsidiaries, the financial condition and results of operations of the combined group, as well as the distributable reserves of Linde plc.

Although Linde plc currently expects to pay dividends, any dividend paid or changes to dividend policy are within the discretion of the board of directors and will depend upon many factors, including distributions of earnings to Linde plc by its subsidiaries, the financial condition and results of operations of the combined group, legal requirements, including limitations imposed by Irish law, terms of any outstanding shares of preferred stock, restrictions in any debt agreements that limit its ability to pay dividends to shareholders, restrictions in any series of preferred stock and other factors the board of directors deems relevant. As a holding company, Linde plc will conduct substantially all of its operations through its subsidiaries, such entities will generate substantially all of its operating income and cash flow, and Linde plc's ability to pay dividends is limited under Irish law to the extent it has distributable reserves. Distributable reserves means the accumulated realized profits so far as not previously utilized by distribution or capitalization, less accumulated realized losses so far as not previously written off in a reduction or a reorganization of capital duly made. In addition, no distribution or dividend may be made if, at that time, the net assets of Linde plc are not, or would not be after giving effect to such distribution or dividend, equal to, or in excess of, the aggregate of Linde plc's called-up share capital plus undistributable reserves. Linde plc's ability to pay dividends in the future is affected by a number of factors, principally on its ability to receive sufficient dividends from its subsidiaries. The ability of such entities to make dividend payments to Linde plc depends largely on their financial condition and ability to generate profits. In addition, because Linde plc's subsidiaries are separate and distinct legal entities, they will have no obligation to pay any dividends or to lend or advance to Linde plc funds and may be restricted from doing so by contract, including other financing arrangements, charter provisions, other shareholders or the applicable laws and regulations of the various countries in which they operate. Additionally, claims of the creditors of Linde plc's subsidiaries have priority over any claims that Linde plc may have with respect to the assets of its subsidiaries. Further, the ability of Linde plc to direct dividend payments from Linde AG may be limited subject to Linde AG becoming a wholly-owned indirect subsidiary of Linde plc for which there can be no assurance. Any delay in implementing the post-completion reorganization could adversely impact the payment of dividends from Linde AG to Linde plc.

Linde plc will not have distributable reserves immediately following completion of the business combination. Until such time as Linde plc creates distributable reserves through dividends from its subsidiaries, the creation of distributable reserves of Linde plc (by reducing its share premium) requires the approval of the Irish High Court and, in connection with seeking such court approval, the approval of Praxair shareholders on a non-binding advisory basis was obtained at the special meeting of shareholders of Praxair, Inc. and approval on a non-binding advisory basis is provided by the Linde AG shareholders as part of the offer acceptance to allow for the creation of distributable reserves of Linde plc. Linde plc is not aware of any reason why the Irish High Court would not approve the creation of distributable reserves, however, the issuance of the required order is a matter for the discretion of the Irish High Court. In the event that distributable reserves of Linde plc are not created in this way, distributions by way of dividends, share repurchases or otherwise will generally not be permitted under Irish law until such time as the group has created sufficient distributable reserves in the audited statutory financial statements of Linde plc as a result of its business activities.

The rights of the shareholders of Linde plc and the responsibilities of members of Linde plc's board of directors will be governed by Irish law and the Linde plc constitution, which will differ in some respects from the rights and responsibilities of shareholders under Delaware or German law and the current organizational documents of Praxair, Inc. and Linde AG.

Following the completion of the business combination, Linde plc's corporate affairs will be governed by the Linde plc constitution and the laws governing companies incorporated in Ireland. The rights of Linde plc shareholders and the responsibilities of members of the Linde plc board of directors under the laws of Ireland will differ from the rights of shareholders and the responsibilities of a company's board of directors under the laws of Delaware and the supervisory board and executive board of a company under German law.

Irish law significantly limits the circumstances under which shareholders in Irish companies may bring derivative actions and does not afford appraisal rights to dissenting shareholders in the form available under certain circumstances to shareholders of a U.S. company.

Praxair shareholders and Linde AG shareholders will have a reduced ownership and voting interest after the business combination and will exercise less influence over management of the combined group.

After the completion of the business combination, Praxair shareholders and Linde AG shareholders will own a smaller percentage of Linde plc than they currently own of Praxair, Inc. and Linde AG, respectively, because ownership in Linde plc shares will be allocated between Praxair and Linde AG shareholders in accordance with the exchange ratios set forth in the business combination agreement. Consequently, Praxair shareholders, as a group, will have reduced ownership and voting power in the combined group compared to their current ownership and voting power in Praxair, Inc., and Linde AG shareholders, as a group, will have reduced ownership and voting power in the combined group compared to their current ownership and voting power in Linde AG and each, as a group, could exercise less influence over the management and policies of the combined group than they currently have over the management and policies of Praxair and Linde, respectively.

Linde plc shareholders could be diluted in the future if Linde plc increases its issued share capital because of the dis-application of statutory preemption rights. In addition, shareholders in certain jurisdictions, including the United States, may not be able to exercise their pre-emption rights even if those rights have not been dis-applied.

As a matter of Irish law, holders of Linde plc shares will have a pre-emption right with respect to any issuance of Linde plc shares for cash consideration or the granting of rights to subscribe for Linde plc shares for cash consideration, unless such pre-emption right is dis-applied, in whole or in part, either in the Linde plc constitution or by resolution of the shareholders of Linde plc at a general meeting of shareholders or otherwise. It is intended that the Linde plc constitution that will be in effect upon the completion of the business combination will dis-apply the statutory pre-emption rights to the maximum extent permitted by Irish law, *i.e.*, the Linde plc board of directors will be permitted to issue up to all of Linde plc's authorized but unissued share capital on a non pre-emptive basis for cash consideration at any stage during the period of five years after the date of completion of the business combination. Accordingly, the board of directors will have discretion to issue up to all of Linde plc's authorized but unissued share capital for cash consideration without regard to pre-emption rights for a period of five years from the date of completion of the business combination. In addition, even if the dis-application of pre-emption rights contained in the Linde plc constitution expires (and is not renewed by shareholders at general meeting) or is terminated by the shareholders of Linde plc in a general meeting, due to laws and regulations in certain jurisdictions outside Ireland, shareholders in such jurisdictions may not be able to exercise their pre-emption rights unless Linde plc takes action to register or otherwise qualify the rights offering under the laws of that jurisdiction. For example, in the United States, U.S. holders of Linde plc shares may not be able to exercise pre-emption rights unless a registration statement under the Securities Act is declared effective with respect to the Linde plc shares issuable upon exercise of such rights or an exemption from the U.S. registration requirements is available. If shareholders in such jurisdictions are unable to exercise their pre-emption rights, their ownership interest in Linde plc would be diluted. Any future issuance of Linde plc shares or debt instruments convertible into Linde plc shares where pre-emption rights of Linde plc shareholders are not available or are excluded would result in the dilution of existing Linde plc shareholders and reduce the earnings per Linde plc share, which could have a material adverse effect on the price of Linde plc shares.

U.S. civil liabilities may not be enforceable against Linde plc.

Linde plc is organized under the laws of Ireland and substantial portions of its assets will be located outside of the United States. In addition, certain members of the board of directors of Linde plc (the "Linde plc board of directors") reside outside the United States. As a result, it may be difficult for investors to effect service of process within the United States upon Linde plc or such other persons, or to enforce outside the United States judgments obtained against such persons in U.S. courts in any action, including actions predicated upon the civil liability provisions of the U.S. federal securities laws. In addition, it may be difficult for investors to enforce, in original actions brought in courts in jurisdictions located outside the United States, rights predicated upon the U.S. federal securities laws.

A judgment for the payment of money rendered by a court in the United States would not be automatically enforceable in Ireland. There is no treaty between Ireland and the United States providing for the reciprocal enforcement of foreign judgments. The following requirements must be met before the foreign judgment will be deemed to be enforceable in Ireland:

(i) the judgment must be for a definite sum;

(ii) the judgment must be final and conclusive; and

(iii) the judgment must be provided by a court of competent jurisdiction.

An Irish court will also exercise its right to refuse judgment if the foreign judgment (a) was obtained by fraud; (b) violated Irish public policy; (c) is in breach of natural justice; or (d) if the judgment is irreconcilable with an earlier foreign judgment.

Based on the foregoing, there can be no assurance that U.S. investors will be able to enforce against Linde plc, any member of its board of directors, the Linde AG supervisory board or executive board, or the Praxair, Inc.

board of directors, or any officer of such companies, or any expert named herein who is a resident of a country other than the United States, any judgments obtained in U.S. courts in civil and commercial matters, including judgments under the U.S. federal securities laws.

In addition, there is doubt as to whether an Irish court would accept jurisdiction and impose civil liability on Linde plc, any member of its board of directors, or any officer who is a resident of a country other than the United States, in an original action predicated solely upon the U.S. federal securities laws brought in a court of competent jurisdiction in Ireland against Linde plc or such director or officer, respectively.

Item 1B. Unresolved Staff Comments

None.

Item 2. Properties

Linde plc neither rents nor owns any properties. Linde plc uses the office space of Linde located at The Priestley Centre, 10 Priestley Road, Surrey Research Park, Guildford, Surrey GU2 7XY United Kingdom at no cost.

Item 3. Legal Proceedings

None.

Item 4. Mine Safety Disclosures

Not applicable.

PART II

Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities

Market Information

There is currently no public trading market for the Company's securities. In connection with the completion of the business combination, Linde plc will apply to list and admit to trading its ordinary shares on the New York Stock Exchange and the Frankfurt Stock Exchange and will seek inclusion in the S&P 500 and DAX 30 indices.

Holders

As of December 31, 2017, Enceladus Holding Limited ("Enceladus") and Cumberland Corporate Services Limited ("Cumberland") are the only shareholders of Linde plc, each holding 12,500 A ordinary shares of €1.00 each in the capital of Linde plc.

Enceladus is wholly owned by Praxair’s Irish legal counsel. It was established as a corporate services provider to facilitate transactions undertaken by clients of Praxair’s Irish legal counsel and it is managed by its board of directors.

Cumberland is wholly owned by Linde’s Irish legal counsel. It was established as a corporate services provider to facilitate transactions undertaken by clients of Linde’s Irish legal counsel and it is managed by its board of directors.

Dividends

Linde plc has not paid any dividends to date.

General Provisions Relating to Profit Allocation and Dividend Payments under Irish Law

Under Irish law, Linde plc may only pay dividends, make distributions and also generally repurchase or redeem shares from its distributable reserves, which are, generally, its accumulated realized profits so far as not previously utilized by distribution or capitalization, less its accumulated realized losses so far as not previously written off in a reduction or reorganization of capital duly made. In addition, no distribution or dividend may be made if the net assets of Linde plc are not, or if making such distribution or dividend will cause the net assets of Linde plc to not be, equal to, or in excess of, the aggregate of Linde plc’s called-up share capital plus undistributable reserves. Undistributable reserves include Linde plc’s undenominated capital and the amount by which Linde plc’s accumulated unrealized profits exceeds its accumulated unrealized losses.

The determination as to whether or not Linde plc has sufficient distributable reserves to fund a dividend must be made by reference to Linde plc’s most recent unconsolidated annual audited financial statements or other financial statements properly prepared in accordance with the Companies Act 2014 (as amended) (Ireland). The relevant financial statements must be filed in the Companies Registration Office (the official public registry for companies in Ireland).

Immediately following the business combination, the unconsolidated balance sheet of Linde plc will not contain any distributable reserves, and “shareholders’ equity” in such balance sheet will be comprised entirely of (i) “share capital” (equal to the aggregate nominal value of the Linde plc shares issued pursuant to the business combination), (ii) “share premium” (resulting from the issuance of Linde plc shares as part of the merger which will be equal to the aggregate market value of Praxair less the nominal value of the share capital issued to Praxair shareholders), (iii) the “merger reserve” (resulting from the issuance of Linde plc shares in connection with the German exchange offer which will be equal to the aggregate market value of Linde AG shares owned by Linde plc on completion of the business combination, less the share capital issued to Linde shareholders) and (iv) incorporation "share premium" (resulting from the share premium paid in by Enceladus and Cumberland in respect of the 25,000 ordinary shares of €1.00 each in the capital of Linde plc issued on incorporation which is equal to the aggregate sum of €25,000 ($26,827)).

Dividend Policy

The dividend policy for the combined group will be determined following completion of the business combination. The Linde plc constitution authorizes the directors to declare dividends out of funds lawfully available without shareholder approval. The board of directors may also recommend a dividend to be approved and declared by the Linde plc shareholders at a general meeting. Any dividend paid or changes to dividend policy are within the discretion of the board of directors and will depend upon many factors, including distributions of earnings to Linde plc by its subsidiaries, the financial condition and results of operations of the combined group, legal requirements, including limitations imposed by Irish law, terms of any outstanding shares of preferred stock, restrictions in any debt agreements that limit its ability to pay dividends to shareholders, restrictions in any series of preferred stock and other factors the board of directors deems relevant. Linde plc currently expects to pay dividends subject to its ability to do so.

Issuer Purchases of Equity Securities

None.

Securities Authorized for Issuance under Equity Compensation Plan

None.

Item 6. Selected Financial Data

The information set forth below is a summary that should be read together with the consolidated financial statements of Linde plc and the related notes thereto, included in Item 8 to this Form 10-K. To date, Linde plc has not conducted any material activities other than those incidental to its formation and the matters contemplated by the business combination agreement.

From the Consolidated Statement of Income - in USD	**April 18, 2017 - December 31, 2017**
Other expenses	$ 1,882,646
Operating loss	(1,882,646)
Net finance costs	—
Loss before tax	(1,882,646)
Income tax	—
Net income (loss) for the period	(1,882,646)
Other comprehensive income	
Other comprehensive income (loss) for the period, net of tax	(42,828)
Total comprehensive loss for the period	$ (1,925,474)
Net income (loss) per share - basic and diluted	$ (75.31)
Weighted average shares outstanding - basic and diluted	25,000

From the Consolidated Balance Sheet - in USD	December 31, 2017	Opening Balance April 18, 2017
ASSETS		
CURRENT ASSETS		
Cash at banks	$ 84,862	$ —
Other assets	9,129,562	—
NON-CURRENT ASSETS	—	—
TOTAL ASSETS	$ 9,214,424	$ —
SHAREHOLDER'S EQUITY AND LIABILITIES		
CURRENT LIABILITIES		
Accrued liabilities	$ 1,644,799	$ —
Related party debt (Note 7)	9,501,470	—
NON CURRENT LIABILITIES	—	—
CAPITAL AND RESERVES		
Share Capital (A ordinary shares of €1.00 each, authorized and issued shares - 25,000 shares)	26,827	26,827
Additional paid-in capital	26,827	26,827
Accumulated other comprehensive income	(42,828)	—
Receivable from shareholders	(60,025)	(53,654)
Retained earnings (losses)	(1,882,646)	—
TOTAL SHAREHOLDER'S EQUITY	(1,931,845)	—
EQUITY AND LIABILITIES	$ 9,214,424	$ —

From the Consolidated Statement of Cash Flows - in USD	April 18, 2017 - December 31, 2017
OPERATIONS	
Net income (loss)	$ (1,882,646)
Working capital:	
Accrued liabilities	1,847,848
Net cash provided by (used for) operating activities	(34,798)
INVESTING	
Net cash used for investing activities	—
FINANCING	
Related party debt	118,140
Net cash provided by (used for) financing	118,140
Effect of exchange rate changes on cash	1,520
Cash and cash equivalents, beginning-of-period	—
Cash and cash equivalents, end-of-period	$ 84,862

Item 7. Management’s Discussion and Analysis of Financial Condition and Results of Operations

The information set forth below is a summary that should be read together with the consolidated financial statements of Linde plc and the related notes thereto, included in Item 8 to this Form 10-K.

To date, Linde plc has not conducted any material activities other than those incidental to its formation and the matters contemplated by the business combination agreement. Linde plc does not have any material assets and the management of Linde plc has not resolved to make any future investments other than in relation to the business combination. In connection with the proposed business combination, Linde plc filed a Registration Statement on Form S-4 which was declared effective by the SEC on August 14, 2017.

On July 24, 2017 Linde plc entered into a cash management agreement with Praxair International Finance UC to finance the Company´s working capital obligations. The total available amount under the facility is €30,000,000. The cash management agreement is Euro denominated and has a variable interest rate of one month EUR LIBOR plus a 0% spread. The cash management agreement terminates on the earlier of the termination date of the business combination agreement or the business day immediately following the closing date of the business combination. As of December 31, 2017, $9,501,470 was outstanding under this facility primarily related to SEC registration fees paid by Praxair International Finance UC on behalf of Linde plc.

In addition, Linde plc has incurred expenses of $1,882,646 for the period from inception to December 31, 2017, primarily related to accounting and advisory services incurred in connection with the business combination.

As of December 31, 2017, Linde plc did not have any off-balance sheet arrangements. In addition, as of December 31, 2017, Linde plc did not have any long-term debt, capital lease obligations, operating lease obligations, purchase obligations or other long-term liabilities.

Forward-looking Statements

Certain statements and assumptions in this document contain or are based on “forward-looking” information. Forward-looking statements are based on Linde plc’s beliefs and assumptions on the basis of factors currently known to them. These forward-looking statements include terms and phrases such as: “anticipate,” “expect,” “continue,” “should,” “could,” “may,” “plan,” “project,” “predict,” “will,” “potential,” “forecast,” and similar expressions. These forward-looking statements include statements regarding benefits of the proposed business combination, integration plans and expected synergies and cost reductions, anticipated future growth, financial and operating performance and results. Forward-looking statements involve significant risks and uncertainties that may cause actual results to be materially different from the results predicted or expected. No assurance can be given that these forward-looking statements will prove accurate and correct, or that projected or anticipated future results will be achieved. All forward-looking statements included in this document are based upon information available to Linde plc on the date hereof, and Linde plc disclaims and does not undertake any obligation to update or revise any forward-looking statements, whether as a result of new information, future events or otherwise, except as required by law.

In light of these risks, uncertainties and assumptions, the events described in the forward-looking statements might not occur or might occur to a different extent or at a different time than Linde plc has described. All such factors are difficult to predict and beyond Linde plc’s control. These factors include:

- failure to obtain applicable governmental or regulatory approvals in a timely manner or otherwise, or being required to accept conditions, including divestitures, that could reduce the anticipated benefits of the proposed business combination as a condition to obtaining regulatory approvals;

- the ability to implement the business combination and to satisfy applicable closing conditions;

- the ability to integrate the operations of Praxair and Linde, the ultimate outcome of Linde plc’s commercial and operating strategy following completion of the business combination, including the ultimate ability to realize synergies and cost reductions;

- operating costs, customer loss or business disruption being greater than expected in anticipation of, or, if consummated, following, the business combination;

- the effects of a combination of Praxair and Linde, including Linde plc's future financial position, operating results, strategy and plans;
- Linde plc's ability to maintain effective internal controls;
- unanticipated litigation, claims or assessments, as well as the outcome/impact of any current/pending litigation, claims or assessments, including in connection with a potential post-completion reorganization with respect to Linde AG;
- potential security violations to Linde plc's information technology systems;
- the investment performance of Praxair's and/or Linde's pension plan assets, which could require Praxair and/or Linde to increase their pension contributions;
- changes in legislation or governmental regulations affecting Linde plc; international, national or local economic, social or political conditions or other factors such as currency exchange rates, inflation rates, recessionary or expansive trends, taxes and regulations and laws that could adversely affect Linde plc, Praxair and Linde or their clients; and
- other factors discussed elsewhere in this document and in the section "Risk Factors" included in Item 1A. of this Form 10-K.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk

During the period covered by this report, Linde plc did not conduct any material activities and therefore did not incur any significant interest rate risk, foreign currency exchange rate risk, commodity price risk or other relevant market risks.

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Item 8. Financial Statements and Supplementary Data

INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Board of Directors and shareholders of Linde plc:

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Linde plc and its subsidiaries as of December 31, 2017 and April 18, 2017, and the related consolidated statement of income and comprehensive income, cash flows and equity for the period from April 18, 2017 to December 31, 2017, including the related notes (collectively referred to as the “consolidated financial statements”). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2017 and April 18, 2017, and the results of their operations and their cash flows for the period from April 18, 2017 to December 31, 2017 in conformity with accounting principles generally accepted in the United States of America.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company’s management. Our responsibility is to express an opinion on the Company’s consolidated financial statements based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (“PCAOB”) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits of these consolidated financial statements in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud.

Our audits included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ PricewaterhouseCoopers LLP
Stamford, CT
March 23, 2018

We have served as the Company's auditor since 2017.

LINDE PLC (Formerly known as Zamalight plc) AND SUBSIDIARIES
CONSOLIDATED BALANCE SHEETS
(In USD)

	December 31, 2017	Opening Balance April 18, 2017
ASSETS		
CURRENT ASSETS		
Cash at banks	$ 84,862	$ —
Other assets	9,129,562	—
NON-CURRENT ASSETS	—	—
TOTAL ASSETS	$ 9,214,424	$ —
SHAREHOLDER'S EQUITY AND LIABILITIES		
CURRENT LIABILITIES		
Accrued liabilities	$ 1,644,799	$ —
Related party debt (Note 7)	9,501,470	—
NON CURRENT LIABILITIES	—	—
Commitments and contingencies (Note 9)		
CAPITAL AND RESERVES		
Share Capital (A ordinary shares of €1.00 each, authorized and issued shares - 25,000 shares)	26,827	26,827
Additional paid-in capital	26,827	26,827
Accumulated other comprehensive income	(42,828)	—
Receivable from shareholders	(60,025)	(53,654)
Retained earnings (losses)	(1,882,646)	—
TOTAL SHAREHOLDER'S EQUITY	(1,931,845)	—
EQUITY AND LIABILITIES	$ 9,214,424	$ —

The accompanying notes are an integral part of these financial statements.

LINDE PLC (Formerly known as Zamalight plc) AND SUBSIDIARIES
CONSOLIDATED STATEMENT OF INCOME AND OTHER COMPREHENSIVE INCOME
(In USD)

	April 18, 2017 - December 31, 2017
Other expenses	$ 1,882,646
Operating loss	(1,882,646)
Net finance costs	—
Loss before tax	(1,882,646)
Income tax	—
Net income (loss) for the period	(1,882,646)
Other comprehensive income	
Other comprehensive income (loss) for the period, net of tax	(42,828)
Total comprehensive loss for the period	$ (1,925,474)
Net income (loss) per share - basic and diluted	$ (75.31)
Weighted average shares outstanding - basic and diluted	25,000

The accompanying notes are an integral part of these financial statements.

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LINDE PLC (Formerly known as Zamalight plc) AND SUBSIDIARIES
CONSOLIDATED STATEMENT OF CASH FLOWS
(In USD)

	April 18, 2017 - December 31, 2017
OPERATIONS	
Net income (loss)	$ (1,882,646)
Working capital:	
Accrued liabilities	1,847,848
Net cash provided by (used for) operating activities	(34,798)
INVESTING	
Net cash used for investing activities	—
FINANCING	
Related party debt	118,140
Net cash provided by (used for) financing	118,140
Effect of exchange rate changes on cash	1,520
Cash and cash equivalents, beginning-of-period	—
Cash and cash equivalents, end-of-period	$ 84,862

The accompanying notes are an integral part of these financial statements.

LINDE PLC (Formerly known as Zamalight plc) AND SUBSIDIARIES
CONSOLIDATED STATEMENT OF EQUITY
(In USD)

	Share capital	Additional Paid in Capital	Accumulated other comprehensive income	Accumulated deficit	Receivables from shareholders	Total equity
Issue of share capital on incorporation - April 18, 2017	$ 26,827	$ 26,827	$ —	$ —	$ (53,654)	$ —
Loss for the period	—	—	—	(1,882,646)	—	(1,882,646)
Total comprehensive loss for the period - currency translation	—	—	(42,828)	—	(6,371)	(49,199)
December 31, 2017	26,827	26,827	(42,828)	(1,882,646)	(60,025)	(1,931,845)

The accompanying notes are an integral part of these financial statements.

1. Organization and Basis of Presentation

Linde plc, formerly known as Zamalight plc ("Linde plc" or the “Company”), was incorporated as a public limited company under the laws of Ireland on April 18, 2017, by Enceladus Holding Limited ("Enceladus") and Cumberland Corporate Services Limited ("Cumberland"), with an issued share capital of €25,000 ($26,827), comprised of 25,000 A ordinary shares with a nominal value of €1.00 each, and additional paid in capital of €25,000 ($26,827). The A ordinary shares of €1.00 each were initially issued on Linde plc’s incorporation as ordinary shares. These shares were subsequently re-designated as A ordinary shares on July 25, 2017. Zamalight plc was renamed "Linde plc" on July 20, 2017.

The Company is registered in Ireland under the registration number 602527 and with its registered office located at Ten Earlsfort Terrace, Dublin 2, D02 T380 Ireland and principal executive offices at The Priestley Centre, 10 Priestley Road, The Surrey Research Park, Guildford, Surrey GU2 7XY, United Kingdom. The Company was formed on April 18, 2017; accordingly, the financial statements as of that date only comprise the balance sheet (“opening balance sheet”). The Company’s fiscal year ends on December 31, 2017.

The Company was formed in accordance with the requirements of the business combination agreement, dated as of June 1, 2017, as amended (the "business combination agreement"), pursuant to which, among other things, Praxair, Inc., a Delaware corporation (together with its subsidiaries, “Praxair”) and Linde AG, a German stock corporation (together with its subsidiaries, “Linde”) agreed to combine their respective businesses through an all-stock transaction, and become subsidiaries of the Company.

In connection with the proposed business combination, Linde plc filed a Registration Statement on Form S-4 (the "registration statement") which was declared effective by the U. S. Securities and Exchange Commission ("SEC") on August 14, 2017. Linde plc has also filed an offer document with the German Federal Financial Supervisory Authority (*Bundesanstalt fuer Finanzdienstleistungsaufsicht*) (“BaFin”) which was approved for publication by BaFin on August 14, 2017 and published by Linde plc on August 15, 2017 (the "offer document"). Pursuant to the offer document, Linde plc made an offer to exchange each issued and outstanding no-par value bearer share of Linde AG for 1.540 ordinary shares of Linde plc (the “exchange offer”). In addition, Zamalight Subco, Inc., an indirect wholly-owned Delaware subsidiary of Linde plc, will merge with and into Praxair, Inc., with Praxair, Inc. surviving the merger (the “merger”, and together with the exchange offer, the “business combination”). In the merger, each share of Praxair, Inc. common stock will be converted into the right to receive one Linde plc ordinary share. Praxair, Inc.’s stockholders approved the merger at Praxair, Inc.’s special meeting held on September 27, 2017 and on November 24, 2017, the tender period for the exchange offer expired with approximately 92% of all Linde AG shares entitled to voting rights being tendered. The parties currently expect the business combination to be completed in the second half of 2018. Upon completion of the business combination, Linde plc will apply to list its ordinary shares on the New York Stock Exchange and the Frankfurt Stock Exchange, and will seek inclusion in the S&P 500 and DAX 30 indices.

Completion of the business combination remains subject to approval by requisite governmental regulators and authorities, including approvals under applicable competition laws.

The business combination agreement, or certain covenants contained therein, may be terminated for, or may terminate as a result of, certain reasons, including, among others, (a) the mutual consent of Praxair, Inc. and Linde AG to termination, (b) a permanent injunction or order by any governmental entity in Ireland, the United Kingdom, Germany or the United States that prohibits or makes illegal the completion of the Business Combination, (c) the occurrence of a change, event, occurrence or effect that has had or is reasonably expected to have a “material adverse change” (as defined in the business combination agreement) on Linde AG or Praxair, Inc. or (d) the failure to obtain approval by requisite governmental regulators and authorities described in the preceding paragraph.

To date, the Company has not conducted any material activities other than those incidental to its formation and the matters contemplated by the business combination agreement such as the incurrence of SEC registration fees and other transaction-related costs (see Note 3 - Subsidiaries). For additional information related to the business combination agreement, please refer to the registration statement.

To the extent that the Company does not have sufficient funds available to satisfy its obligations, Praxair, Inc. will finance any out of pocket expenses incurred by the Company in connection with the business combination agreement and the transactions contemplated by the business combination agreement. If the Business Combination is not completed, any expenses incurred by the Company and/or its affiliates will be shared equally by Praxair, Inc. and Linde AG, to the extent not prohibited by applicable law and as otherwise provided in the business combination agreement.

These financial statements have been prepared in compliance with US GAAP.

The following new accounting standards in the United States issued by the Financial Accounting Standards Board (“FASB”) have not yet been implemented by the Company. The Company will evaluate, when applicable, the impacts of adopting the below standards on future periods:

- **Revenue Recognition -** In May 2014, the FASB issued updated guidance on the reporting and disclosure of revenue. The new guidance requires the evaluation of contracts with customers to determine the recognition of revenue when or as the entity satisfies a performance obligation, and requires expanded disclosures. Subsequently, the FASB has issued amendments to certain aspects of the guidance including the effective date. This guidance is required to be effective beginning in the first quarter 2018 and includes several transition options.
- **Leases -** In February 2016, the FASB issued updated guidance on the accounting and financial statement presentation of leases. The new guidance requires lessees to recognize a right-of-use asset and lease liability for all leases, except those that meet certain scope exceptions, and would require expanded quantitative and qualitative disclosures. This guidance will be effective beginning in the first quarter 2019 and requires companies to transition using a modified retrospective approach.
- **Credit Losses on Financial Instruments -** In June 2016, the FASB issued an update on the measurement of credit losses. The guidance introduces a new accounting model for expected credit losses on financial instruments, including trade receivables, based on estimates of current expected credit losses. This guidance will be effective beginning in the first quarter 2020, with early adoption permitted beginning in the first quarter 2019 and requires companies to apply the change in accounting on a prospective basis.
- **Classification of Certain Cash Receipts and Cash Payments -** In August 2016, the FASB issued updated guidance on the classification of certain cash receipts and cash payments within the statement of cash flows. The update provides accounting guidance for specific cash flow issues with the objective of reducing diversity in practice. This new guidance will be effective beginning in the first quarter 2018 on a retrospective basis, with early adoption optional.
- **Intra-Entity Asset Transfers -** In October 2016, the FASB issued updated guidance for income tax accounting of intra-entity transfers of assets other than inventory. The update requires an entity to recognize the income tax consequences of an intra-entity transfer of an asset other than inventory in the period when the transfer occurs. This new guidance will be effective beginning in the first quarter 2018, with early adoption permitted, and should be applied on a modified retrospective basis.
- **Simplifying the Test for Goodwill Impairment -** In January 2017, the FASB issued updated guidance on the measurement of goodwill. The new guidance eliminates the requirement to calculate the implied fair value of goodwill to measure a goodwill impairment charge. The guidance will be effective beginning in the first quarter 2020 with early adoption permitted.
- **Pension Costs** - In March 2017, the FASB issued updated guidance on the presentation of net periodic pension cost and net periodic postretirement benefit cost. The new guidance requires the service cost component be reported in the same line item or items as other compensation costs arising from services rendered by employees during the period. The other components of net benefit cost are required to be presented in the income statement separately from the service cost component and not included within operating profit. This guidance will be effective beginning in the first quarter 2018, with early adoption optional, and requires companies to transition using a retrospective approach for the presentation of the service cost component and the other cost components and prospectively for the capitalization of the service cost component.
- **Derivatives and Hedging** - In August 2017, the FASB issued updated guidance on accounting for hedging activities. The new guidance changes both the designation and measurement for qualifying hedging relationships and the presentation of hedge results. This guidance will be effective beginning in the first quarter 2019, with early adoption optional.
- **Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income** – In February 2018, the FASB issued updated guidance which allows a reclassification from accumulated other comprehensive income to retained earnings for stranded tax effects resulting from the Tax Cuts and Jobs Act.

This new guidance will be effective beginning in the first quarter 2019 on a retrospective basis, with early adoption optional.

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2. Accounting Policies

Basis of Preparation

The financial statements present the consolidated results and financial position of the Company and its subsidiaries for the period from incorporation being April 18, 2017 to December 31, 2017.

Going Concern

The financial statements have been prepared on a going concern basis, taking account of the facilities available under the cash management agreement (see Note 7).

Currency

Items included in these consolidated financial statements are measured using the currency of the primary economic environment in which the entity operates (‘the functional currency’). The financial information is presented in U.S. Dollars ("USD"). The US Dollar/Euro exchange rate at April 18, 2017 was 0.9319 and at December 31, 2017 was 0.8330.

Consolidation and Subsidiaries

Subsidiaries are all entities over which the Company and its group has control. The group controls an entity when the group is exposed to, or has rights to, variable returns from its involvement with the entity and has the ability to affect those returns through its power to direct the activities of the entity. Subsidiaries are fully consolidated from the date on which control is transferred to the group. They are deconsolidated from the date that control ceases.

The acquisition method of accounting is used to account for business combinations by the group.

Intercompany transactions, balances and unrealized gains on transactions between group companies are eliminated. Unrealized losses are also eliminated unless the transaction provides evidence of an impairment of the transferred asset.

Cash and Cash Equivalents

Cash and cash equivalents consist of cash at banks or other highly liquid securities with original maturities of three months or less.

Other Receivables

Other receivables are non-derivative financial assets with fixed or determinable payments that are not quoted in an active market. Other receivables are stated at the lower of amortized cost or recoverable amount. If collection of the amounts is expected in one year or less they are classified as current assets.

Other Provisions

The Company accrues liabilities for non-income tax contingencies when management believes that a loss is probable and the amounts can be reasonably estimated, while contingent gains are recognized only when realized. If new information becomes available or losses are sustained in excess of recorded amounts, adjustments are charged against income at that time. Management does not anticipate that in the aggregate such losses would have a material adverse effect on the Company's balance sheet or liquidity.

Share Capital

According to article 3 of Linde plc's Articles of Association, the authorized share capital of the Company is €1,775,000 divided into 1,750,000,000 ordinary shares of €0.001 each and 25,000 A ordinary shares of €1.00 each.

As of the opening balance sheet date and as of December 31, 2017, 25,000 A ordinary shares had been issued and 12,500 shares were held by Enceladus which is wholly owned by Praxair, Inc.'s Irish legal counsel Arthur Cox, and 12,500 shares were held by Cumberland which is wholly owned by Linde AG´s Irish legal counsel William Fry, the Company's shareholders. Furthermore, an additional €25,000 ($26,827) was committed to be paid by the two shareholders.

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A ordinary shares are classified as equity. Incremental costs directly attributable to the issue of new shares are capitalized and upon the closing of the associated equity transaction are reclassified to equity as a deduction, net of tax, from the proceeds.

As of December 31, 2017, the Company was not subject to any capital requirements.

Income Taxes

The income tax expense or credit for the period is the tax payable on the current period's taxable income based on the applicable income tax rate for each jurisdiction adjusted by changes in deferred tax assets and liabilities attributable to temporary differences and to unused tax losses.

Deferred tax assets are recognized only if it is probable that future taxable amounts will be available to utilize those temporary differences and losses. No deferred tax has been recognized as at December 31, 2017, as the Company has recently been incorporated and therefore does not have any history of income.

3. Subsidiaries

The principal subsidiaries of the Company, all of which have been included in these consolidated financial statements, are as follows:

Name	Country of Incorporation and Principal Place of Business	Proportion of Ownership Interest at	
		December 31, 2017	April 18, 2017
Zamalight Holdco LLC	USA	100 %	— %
Zamalight Subco, Inc.	USA	100 %	— %
Linde Holding GmbH	Germany	100 %	— %
Linde Intermediate Holding AG	Germany	100 %	— %

On May 26, 2017, the Company formed Zamalight Holdco LLC, a Delaware limited liability company. Immediately following its formation, Zamalight Holdco LLC formed Zamalight Subco, Inc., a Delaware corporation, as a wholly owned U.S. subsidiary of Zamalight Holdco LLC. Upon effectiveness of the Merger, Zamalight Subco, Inc. will merge with and into Praxair, Inc., with Praxair, Inc. surviving the Merger as an indirect wholly-owned subsidiary of the Company.

On July 26, 2017, the Company formed Linde Holding GmbH, a German limited liability company (GmbH), which on July 28, 2017 in turn formed Linde Intermediate Holding AG, a German stock corporation (AG), to facilitate the settlement of the Exchange Offer and a post-completion reorganization with respect to Linde AG.

4. Receivables from Shareholders

This relates to a receivable from the two shareholders and comprises two checks of €25,000 each which are being held on behalf of the Company by Praxair, Inc.'s Irish legal counsel. Due to the short-term nature of the current receivables, their carrying amount is considered to be the same as their fair value.

5. Other Assets

Other assets at December 31, 2017 of $9,129,562 relate to the costs to issue equity securities (SEC registration fee). When the business combination is completed, these costs will be reclassified to additional paid-in capital. In case the business combination is not completed, these costs will be expensed and reimbursed to Linde plc by Praxair, Inc. and Linde AG.

6. Accrued Liabilities

Accrued liabilities at December 31, 2017 for the amount of $1,644,799 consist of expenses incurred in connection with the business combination and mainly relate to fees for accounting and advisory services.

7. Related Parties

Related parties are the members of the executive bodies of the Company and those companies as described in Note 1.

On July 24, 2017 the Company entered into a cash management agreement with Praxair International Finance UC to finance the Company´s working capital obligations. The total available amount under the facility is €30,000,000. The cash management agreement is Euro denominated and has a variable interest rate of one month EUR LIBOR plus a 0% spread. The cash management agreement terminates on the earlier of the termination date of the business combination agreement or the business day immediately following the closing date of the business combination.

At December 31, 2017, $9,501,470 was outstanding under this facility as follows:

	December 31, 2017
SEC registration fee*	$ 9,129,562
Incorporation of Linde Intermediate Holding AG	60,025
Incorporation of Linde Holding GmbH	60,025
BaFin registration fee*	120,050
All other*	131,808
	$ 9,501,470

* Paid directly to the SEC, BaFin and other vendors by Praxair International Finance UC on behalf of Linde plc and treated as a non-cash transaction in the Consolidated Statement of Cash Flows.

8. Loss per share

	April 18, 2017 to December 31, 2017
Net income (loss) from continuing operations attributable to the owners of the company	$ (1,882,646)
Weighted average shares outstanding	25,000
Net income (loss) per share - basic and diluted	$ (75.31)

9. Commitments and Contingencies

There are no pending legal proceedings or claims against the Company.

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10. Quarterly Data (Unaudited)

2017	April 18, 2017 - June 30, 2017	Q3	Q4	April 18, 2017 - December 31, 2017
Other expenses	$ 462,640	$ 290,825	$ 1,129,181	$ 1,882,646
Operating loss	(462,640)	(290,825)	(1,129,181)	(1,882,646)
Net finance costs	—	—	—	—
Loss before tax	(462,640)	(290,825)	(1,129,181)	(1,882,646)
Income tax	—	—	—	—
Net income (loss) for the period	(462,640)	(290,825)	(1,129,181)	(1,882,646)
Net income (loss) per share - basic and diluted	$ (18.51)	$ (11.63)	$ (45.17)	$ (75.31)
Weighted average shares outstanding - basic and diluted	25,000	25,000	25,000	25,000

Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure

None.

Item 9A. Controls and Procedures

Conclusion Regarding the Effectiveness of Disclosure Controls and Procedures

Based on an evaluation of the effectiveness of Linde plc’s disclosure controls and procedures, which was made under the supervision and with the participation of management, including Linde plc’s principal executive officer and principal financial officer, the principal executive officer and principal financial officer has concluded that, as of the end of the quarterly period covered by this report, such disclosure controls and procedures are effective in ensuring that information required to be disclosed by Linde plc in reports that it files under the Exchange Act of 1934 is recorded, processed, summarized and reported within the time periods specified in the Securities and Exchange Commission’s rules and forms, and accumulated and communicated to management, including Linde plc’s principal executive officer and principal financial officer, to allow timely decisions regarding required disclosure.

Changes in Internal Control over Financial Reporting

There were no changes in Linde plc’s internal control over financial reporting that occurred during the fourth quarter of 2017 that have materially affected, or are reasonably likely to materially affect, Linde plc’s internal control over financial reporting.

Management’s Report on Internal Control Over Financial Reporting

This Form 10-K does not include a report of management’s assessment regarding internal control over financial reporting or an attestation report of Linde plc's independent registered accounting firm due to a transition period established by rules of the SEC for newly public companies.

Item 9B. Other Information

None.

PART III

Item 10. Directors, Executive Officers and Corporate Governance

Corporate Governance Structure of Linde plc

Overview

Linde plc is required to comply with the Companies Act 2014 (as amended) (Ireland). However, there is no corporate governance regime applicable to Linde plc in Ireland because the Linde plc shares are not listed in Ireland. Following completion of the business combination, Linde plc will be subject to the corporate governance frameworks required by virtue of the listing of the Linde plc shares on the New York Stock Exchange and Frankfurt Stock Exchange.

Directors

Linde plc is currently managed by a board of directors with four directors, two designated by Praxair and two by Linde. Decisions of the board prior to the completion of the business combination may only be made by a majority of the directors. Under its existing constitution, the directors of Linde plc serve indefinitely and are not subject to annual re-election.

The following individuals are currently the directors of Linde plc:

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Name	Age	Present Principal Occupation or Employment, Employment History and Other Directorships Held in the Last Five Years
Guillermo Bichara	43	Mr. Bichara was appointed Vice President, General Counsel and Corporate Secretary of Praxair, Inc. effective January 1, 2015. Prior to this, from 2013 - 2014, he was Associate General Counsel and Assistant Secretary. From 2011 - 2013, Mr. Bichara served as Associate General Counsel with responsibility for Praxair Europe, Praxair Mexico and corporate transactions. He was Vice President and General Counsel of Praxair Asia from 2007 - 2011, and joined Praxair in 2006 as director of legal affairs at Praxair Mexico. Prior to joining Praxair, Mr. Bichara served as corporate counsel at CEMEX, Mexico's global leader in the building materials industry, and was a foreign associate and counsel, respectively, at the law firms of Skadden, Arps, Slate, Meagher & Flom and White & Case.
Andrew Brackfield	61	Mr. Brackfield serves as Head of Legal, M&A, at Linde, a position that he has held since September 2015. He was Head of Legal M&A and Finance from 2012 until 2015 and prior to that held senior legal positions within Linde and The BOC Group Limited, which was acquired by Linde in 2006. Mr. Brackfield is also a Director of a number of Linde subsidiaries. Prior to joining The BOC Group Limited, Mr. Brackfield was a partner at Linklaters. He holds the position of company secretary at Linde plc. Mr. Brackfield is an English solicitor and holds a law degree from the University of Cambridge.
Christopher Cossins	51	Mr. Cossins has served as Head of Tax, UK and Financial Restructuring for Linde since 2007. Mr. Cossins is also a Director of a number of Linde subsidiaries. Prior to joining The BOC Group Limited, Mr. Cossins was employed by KPMG. He holds the positions of principal executive officer, principal financial officer and principal accounting officer of Linde plc. Mr. Cossins is a chartered accountant and holds an engineering degree from the University of Nottingham.
Richard L. Steinseifer	60	Mr. Steinseifer was named vice president of Mergers and Acquisitions for Praxair, Inc. in 2005. He has primary responsibility for the implementation of all merger, acquisition, divestiture and joint-venture transactions for the company, its affiliates and subsidiaries. Mr. Steinseifer joined Praxair in 1996 as director of financial services for Praxair's largest business unit, North American Industrial Gases. In 2001, he was named director of acquisitions for Healthcare and, in 2003, his role was expanded to vice president, business development. Prior to joining Praxair, Mr. Steinseifer held positions as vice president, controller and director, international business development, during his six years at Liquid Carbonic, the industrial gases division of CBI Industries. Prior to that, he spent eight years with GE Medical Systems and four years with J.I. Case Company in financial management positions.

All four of the existing directors will resign effective at the closing of the business combination and will be replaced with the directors determined by Praxair and Linde in accordance with the Linde plc constitution.

The directors of Linde plc can be reached at Linde plc's principal executive offices: The Priestley Centre, 10 Priestley Road, The Surrey Research Park, Guildford, Surrey GU2 7XY, United Kingdom (tel. +44 1483 242200).

Section 16(a) Beneficial Ownership Reporting Compliance

Because the Company’s ordinary shares are not registered under Section 12 of the Securities Exchange Act of 1934 (the "Exchange Act"), the Company’s officers, directors and persons who own more than ten percent of the Company’s ordinary shares, are not required to file reports of ownership and reports of changes in ownership under Section 16(a) of the Exchange Act with the SEC.

Code of Ethics

Linde plc has not adopted a code of ethics. Given the nature of the Company’s business, its limited shareholder base and current composition of management, the board does not believe that the Company requires a code of ethics at this time.

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Committees

Linde plc has not yet established an audit committee, a nomination and governance committee or a compensation committee.

Executive Officers of the Registrant

Christopher Cossins is the principal executive officer, principal financial officer and principal accounting officer of Linde plc. For additional information about Mr. Cossins, see "Directors" included in this Item 10 above.

Item 11. Executive Compensation

As of the date of this report, the Company has not paid any compensation to its directors or executive officer.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters

Security Ownership of Certain Beneficial Owners

As of the date of this report, Enceladus and Cumberland are the Company's only shareholders, each holding 12,500 A ordinary shares, nominal value of €1.00 each, in the capital of Linde plc.

Equity Compensation Plans

As of December 31, 2017, the Company did not have any compensation plans (including individual compensation arrangements) under which equity securities of the registrant were authorized for issuance.

Item 13. Certain Relationships and Related Transactions and Director Independence

Director Independence

The Company has not established its own standard for determining whether its directors and nominees for directors are “independent” nor has it adopted any other standard of independence employed by any national securities exchange or inter-dealer quotation system. Under the independence standards of the New York Stock Exchange, on which the Company’s stock is expected to be listed and traded following completion of the business combination, Messrs. Cossins and Brackfield would not be deemed to be “independent” given that Mr. Cossins is also the principal executive officer, principal financial officer and principal accounting officer of Linde plc and Mr. Brackfield is also the corporate secretary of Linde plc. In addition to serving as members of the Linde plc board of directors, Messrs. Brackfield and Cossins are employed by Linde. In this context, they participate in Linde’s share-based incentive program for executives, the Linde LTIP and the retention scheme which was set up by Linde in connection with the business combination and have entered into indemnification agreements with Linde. Besides this, Messrs. Brackfield and Cossins hold Linde shares. Messrs. Bichara and Steinseifer would not be deemed to be “independent” under the independence standards of the New York Stock Exchange because in addition to serving as members of the Linde plc board of directors, Messrs. Bichara and Steinseifer are employed by Praxair, Inc. In their capacities as employees of Praxair, Inc., Messrs. Bichara and Steinseifer receive a salary which comprises, among others, equity awards. In this context, Messrs. Bichara and Steinseifer hold Praxair shares and other equity-based awards for Praxair.

In their capacity as members of the Linde plc board of directors, Messrs. Bichara, Steinseifer, Brackfield and Cossins receive no compensation and none of them holds shares or equity-based instruments in Linde plc.

Certain Relationships and Transactions

Linde plc has not yet adopted a policy for review of related person transactions. Given the nature of the Company's business, its limited shareholder base and current composition of management, the board does not believe that the Company requires a policy at this time.

On July 24, 2017 the Company entered into a cash management agreement with Praxair International Finance UC to finance the Company´s working capital obligations. The total available amount under the facility is €30,000,000. The cash management agreement is Euro denominated and has a variable interest rate of one month EUR LIBOR plus a 0% spread. The cash management agreement terminates on the earlier of the termination date of the business combination agreement or the business day immediately following the closing date of the business combination. At December 31, 2017, $9,501,470 was outstanding under this facility (see Note 7 to the consolidated financial statements).

Item 14. Principal Accounting Fees and Services

The information required by this item is set forth below.

Independent Auditor Selection

The Company's board of directors has not yet established an audit committee. Therefore, it is the responsibility of the entire board of directors to serve the functions of an audit committee and to pre-approve all audit and permitted non-audit services to be performed by the independent auditors, such approval to take place in advance of such services when required by law, regulation, or rule, subject to the de minimis exceptions for non-audit services described in Section 10A(i)(1)(B) of the Exchange Act that are approved by the board prior to completion of the audit. PricewaterhouseCoopers LLP (“PWC”) was selected as Linde plc's independent auditor for 2017.

Fees Paid to the Independent Auditor

The following is a summary of fees billed by PWC in 2017 for its services.

	Types of Fees					
	Audit	Audit - Related	Tax	All Other	Total	Non-Audit Fees % of Total Audit Fees
2017	210,000	58,900	—	—	268,900	28 %

Audit Fees

These are fees paid for the audit of Linde plc’s annual financial statements, the reviews of the financial statements included in Linde plc’s reports on Form 10-Q and services that are normally provided by the independent auditor in connection with statutory and regulatory filings or engagements for that fiscal year.

Audit-Related Fees

These are fees paid for assurance and related services rendered that are reasonably related to the performance of the audit or review of Linde plc’s financial statements other than the fees disclosed in the foregoing paragraph. These fees included those related to work associated with financial statements prepared under International Financial Reporting Standards.

PART IV

Item 15. Exhibits and Financial Statement Schedules

The following documents are filed as part of this report:

(1) The company’s 2017 Consolidated Financial Statements and the Report of the Independent Registered Public Accounting Firm are included in Part II, Item 8. Financial Statements and Supplementary Data.

(2) Financial Statement Schedules – All financial statement schedules have been omitted because they are not applicable or the required information is shown in the financial statements or notes thereto.

(3) Exhibits – The exhibits filed as part of this Annual Report on Form 10-K are listed in the accompanying index.

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Exhibits

2.01	Business Combination Agreement, dated June 1, 2017, by and among Praxair, Inc., Linde Aktiengesellschaft, Linde Plc (formerly known as Zamalight plc), Zamalight Holdco LLC and Zamalight Subco, Inc. was filed as Annex A to the proxy statement/prospectus forming a part of the Registration Statement on Form S-4 of Linde Plc filed on June 5, 2017, as amended (file no. 333-218485) and is incorporated herein by reference.
2.01(i)	Amendment No. 1, dated August 10, 2017, to the Business Combination Agreement, by and among Praxair, Inc., Linde Aktiengesellschaft, Linde plc (formerly known as Zamalight plc), Zamalight Holdco LLC and Zamalight Subco, Inc. was filed as Annex A to the proxy statement/ prospectus forming a part of the Registration Statement on Form S-4 of Linde Plc, filed on June 5, 2017, as amended (file no. 333-218485) and is incorporated herein by reference.
3.01	Public Limited Company Constitution of Linde Plc was filed as Exhibit 3.01 to Amendment No. 2 to the Registration Statement on Form S-4 of Linde Plc filed on July 28, 2017 (file no. 333-218485) and is incorporated herein by reference.
21.01	Subsidiaries of Linde plc was filed as Exhibit 21.01 to Amendment No. 3 to the Registration Statement on Form S-4 of Linde Plc filed on August 7, 2017 (file no. 333-218485) and is incorporated herein by reference.
31.01	Rule 13a-14(a) and 15d-14(a) Certification
32.01	Section 1350 Certification (such certifications are furnished for the information of the Commission and shall not be deemed incorporated by reference into any filing under the Securities Act or the Exchange Act).
101.INS	XBRL Instance Document
101.SCH	XBRL Taxonomy Extension Schema
101.CAL	XBRL Taxonomy Extension Calculation Linkbase
101.LAB	XBRL Taxonomy Extension Label Linkbase
101.PRE	XBRL Taxonomy Extension Presentation Linkbase
101.DEF	XBRL Taxonomy Extension Definition Linkbase

SIGNATURES

Linde plc and Subsidiaries

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned thereunto duly authorized.

Linde plc

(Registrant)

Date: March 23, 2018

By: /s/ Christopher Cossins

Christopher Cossins

Principal Executive Officer, Principal Finance Officer, and Principal Accounting Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the Registrant and in the capacities indicated on March 23, 2018.

/s/ Guillermo Bichara	/s/ Andrew Brackfield	/s/ Christopher Cossins
Guillermo Bichara ***Director***	**Andrew Brackfield** ***Director***	**Christopher Cossins** ***Director***
/s/ Richard L. Steinseifer		
Richard L. Steinseifer ***Director***		

SUPPLEMENTAL INFORMATION TO BE FURNISHED WITH REPORTS FILED PURSUANT TO SECTION 15(D) OF THE ACT BY REGISTRANTS WHICH HAVE NOT REGISTERED SECURITIES PURSUANT TO SECTION 12 OF THE ACT

No annual report to security holders covering the Registrant's last fiscal year or proxy material has been sent to security holders.