Making our world more productive

Delivering Sustainable Value

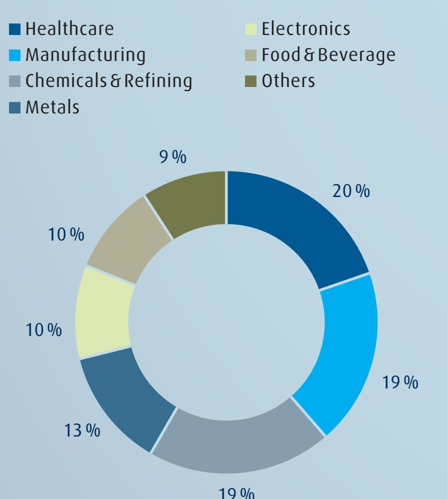
Annual Report 2020

Financial Highlights

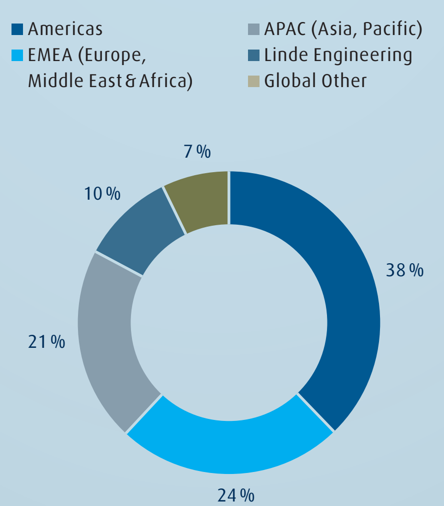
Year ended December 31	2020	2019
Dollar amounts in millions, except per share data	$	$
Reported		
Sales	27,243	28,228
Operating Profit	3,322	2,933
Income from Continuing Operations	2,497	2,183
Diluted Earnings Per Share from Continuing Operations	4.70	4.00
Adjusted[1]		
Sales	27,243	28,163
Operating Profit	5,797	5,272
Income from Continuing Operations	4,371	4,003
Diluted Earnings Per Share from Continuing Operations	8.23	7.34
After-Tax Return on Capital[2]	13.4 %	11.6 %
Other Information		
Cash Flow from Operations	7,429	6,119
Capital Expenditures	3,400	3,682

2020 Sales

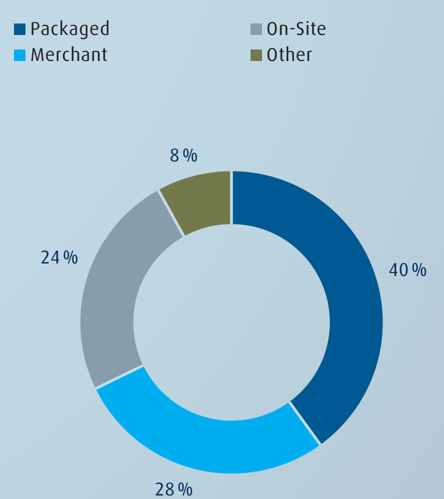
End Markets[3]



Business Segments



Distribution Mode[3]



[1] Adjusted amounts are non-GAAP measures and are reconciled to reported amounts in the "Non-GAAP Financial Measures" Section in Item 7.
[2] Adjusted after-tax return on capital is a non-GAAP measure. For definition and reconciliation, please see Appendix to the Investor Teleconference Presentation Fourth Quarter 2020.
[3] Total sales excluding Linde Engineering.

Dear Shareholders,

After a year impacted by COVID-19, I want to recognize the outstanding performance of Linde employees around the world who, despite challenging conditions, kept our plants running reliably, maintained excellent service to our customers and completed important projects with minimal delays. They developed new protocols to take care of our patients, installed equipment for emergency and temporary care facilities and increased the supply of medical oxygen to help our communities. Our homecare business became a second line of defense in the fight against the virus, treating more than 100,000 COVID-19 patients and freeing up much-needed capacity in overburdened hospitals. Our people achieved all of this and more while maintaining a best-in-class safety performance. I would like to personally thank them for their dedication and perseverance during these unprecedented times.

This past year has demonstrated the resilience of not only Linde's employees, but also our business model. We quickly adjusted cost structures in line with local market conditions. Our strong commercial terms and conditions shielded us from volume disruptions, and we capitalized on more robust growth opportunities in markets like healthcare, electronics and food freezing. The successful merger integration, plus ongoing productivity and efficiency initiatives continued to deliver sustainable value. Excluding the effects of currency, earnings per share grew 13 % while sales were down 2 %. Gross operating cash flow grew 21 % and we returned $ 4.4 billion to our shareholders between dividends and share repurchases. Return on capital, the single most important metric for a capital-intensive business, grew 180 basis points to 13.4 %. Based on our ability to expand free cash flow during the most challenging of economic conditions, we increased our dividend by another 10 % – representing the 28th consecutive year of dividend increases. These results are a testament to our ability to outperform in any macro-economic environment.

While we are proud of our performance, we were not immune to the devastating effects of this virus on our people. As I write this, twenty of our colleagues around the world tragically lost their battle against COVID-19. Our thoughts and prayers go out to their families. Moreover, this pandemic exposed inequalities in our society. In response, we expanded Linde's Global Giving program to over $ 10 million, donating to the most vulnerable in our communities. We continued to prioritize inclusion and I am very pleased to report we are on track to exceed our gender diversity goal of 30 % female employees by 2030. Our recent global employee survey results show we have a highly engaged workforce which appreciates our focus on both core values and performance.

Letter to Shareholders

During 2020, we made huge strides towards our climate change targets. We were included in the Dow Jones Sustainability World Index for the 18th consecutive year – the only chemical company in the world that can make that claim. Compared to our 2018 pre-merger baseline, we reduced our greenhouse gas intensity by more than 16 %, which places us well on track to meet our overall 35 % reduction goal by 2028. A key driver of this reduction is our focus on low-carbon power purchases. Today, low-carbon power represents a little over one-third of our global electricity purchases and we plan on doubling that amount by 2028.

In addition to reducing our own carbon footprint, we developed new applications to help our customers address their carbon emissions. We signed several agreements in Europe, where we will capture the carbon dioxide (CO_2) emissions from our customers' operations and then repurpose that CO_2 for commercial use, such as food freezing, dry ice, beverage carbonation and water treatment. We also made significant progress on our clean hydrogen initiative, forming a dozen partnerships with fuel cell electric vehicle manufacturers, energy companies and renewable power producers. Additionally, we funded groundbreaking projects in the U.S., China, South Korea and Germany which will largely serve heavy-duty mobility applications, like buses, trucks, trains and ferries.

In 2020, the Linde team delivered an outstanding performance during the most challenging of times. As the global economy recovers from the COVID-19 pandemic, we expect to see expanding volumes from our more cyclical markets plus continued growth in our resilient markets, such as healthcare and electronics. Our project backlog of over $8 billion will provide a solid foundation for growth as those projects start up. We are also excited about new opportunities in developing markets like aquaculture, biopharma and commercial space. The combination of stronger growth, disciplined price management and a robust productivity pipeline will deliver double-digit earnings growth on average for years to come.

On top of this, we are well positioned to capitalize on the transition to cleaner energy through our extensive hydrogen, oxygen and carbon capture technologies and capabilities. As the market for clean energy develops, we are confident in our ability to capture more than our fair share of this potentially massive opportunity, and at returns in line with our investment criteria.

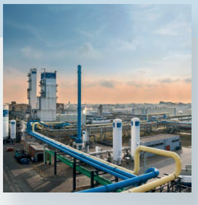
I think you can see why we are all so excited about the future – it has never been brighter!

Sincerely,

Steve Angel

Chief Executive Officer

2020 Highlights



Build, Own and Operate World's Largest PEM Electrolyzer

Scaling up the production of green hydrogen

The new 24-megawatt electrolyzer will produce green hydrogen to supply Linde's industrial customers through the company's existing pipeline network. In addition, Linde will distribute liquefied green hydrogen to refueling stations and other industrial & mobility customers, including to the world's first H_2 ferry. After start-up in 2022, it will be the world's largest PEM electrolyzer and is expected to avoid up to 40,000 MT CO_2e per year.

A Leader in Diversity & Inclusion

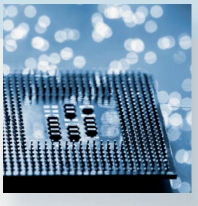
Recognized by external stakeholders globally

Inclusion is a corporate value at Linde, and the company has received several recognitions around the globe for its inclusive culture, initiatives, and performance in diversity metrics. In 2020, Linde achieved a score of 90 % on the Human Rights Campaign Foundation's Corporate Equality Index. For the fourth consecutive year, Linde was named on the Bloomberg Gender-Equality Index. The company has also been named a Top Noteworthy Company by DiversityInc.

Producing Green H_2 in California

Supplying the mobility market with green hydrogen from bio-LNG

Following recent upgrades, Linde's Steam Methane Reformer in Ontario can now supply green hydrogen, meeting renewable requirements of the California Air Resources Board. In 2021, the facility will be ready to supply H_2 at pressures required by the latest generation of hydrogen refueling stations. With these investments, Linde will be able to provide green hydrogen to fuel up to 1,600 vehicles a day and help avoid up to 50,000 MT CO_2e per year.



Supporting Samsung Electronics' Growth in South Korea

Linde's largest single electronics investment

Linde will build, own and operate several ASUs and H_2 plants to support the growing demand for Samsung's world-class semiconductor facilities in Pyeongtaek, South Korea. The project comprises of two phases and includes a long-term supply contract for various ultra-high purity industrial gases, including hydrogen. Once the project is commissioned, the Pyeongtaek complex will be Linde's single largest gases supply site in the world for an electronics customer.

Leadership

Leadership Team

Steve Angel
Chief Executive Officer &
Member of the Board of Directors

Sanjiv Lamba
Executive Vice President &
Chief Operating Officer

Matt White
Executive Vice President &
Chief Financial Officer

Sean Durbin
Executive Vice President
EMEA

Jürgen Nowicki
Executive Vice President &
CEO Linde Engineering

Andreas Opfermann
Executive Vice President
Americas

John Panikar
Executive Vice President
APAC

Guillermo Bichara
Senior Vice President &
General Counsel

David Strauss
Senior Vice President &
Chief Human Resources Officer

Regional Business Heads

Joe Abdoo
President Canada

Moloy Banerjee
President South Asia

Gilney Bastos
President South Latin America

Armando Botello
President Region Europe North

Michael Chambers
CEO GIST

John Evans
President South Pacific

Ben Glazer
President PDI

Josue Lee
President North Latin America

Zhengmin Li
President Greater China

Odessa Mann
General Manager, Helium &
Rare Gas

Jim Mercer
President Region UK & Ireland

Binod Patwari
President ASEAN

Oliver Pfann
President Region Europe East

Veerle Slenders
President Praxair Surface
Technologies

BS Sung
General Manager South Korea

Crispin Teufel
CEO Lincare

Jens Waldeck
President Region Europe West

Dan Yankowski
President Linde Gases US

Corporate Functions

Vanessa Abrahams-John
Chief Diversity Officer

Des Bacher
Vice President Financial Planning
& Performance Management

Anne Boyd
Vice President Tax & Treasury

Kelcey Hoyt
Vice President &
Chief Accounting Officer

Philipp Karmires
Chief Digital Officer

Fabricio Nunes
Chief Compliance Officer

Luiz Oliveira
Vice President Operations
Excellence & Productivity

Juan Pelaez
Vice President Investor Relations

Harry Roegner
Vice President Communications

Björn Schneider
Vice President Internal Audit

Sandeep Sen
Chief Information Officer

Vipin Sher
Vice President Mergers &
Acquisitions & Real Estate

Todd Skare
Chief Technology &
Sustainability Officer

Tony Wallace
Vice President SHEQ

Board of Directors

Wolfgang Reitzle

Chairman,
Executive Committee
(Chairman)

Steve Angel

CEO,
Executive Committee

Ann-Kristin Achleitner

Compensation Committee,
Nomination and
Governance Committee

Clemens Börsig

Audit Committee
(Chairman),
Nomination and
Governance Committee

Nance Dicciani

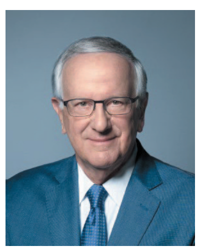
Audit Committee,
Compensation Committee

Thomas Enders

Executive Committee,
Audit Committee

Franz Fehrenbach

Compensation Committee,
Nomination and
Governance Committee



Edward Galante

Compensation Committee
(Chairman),
Audit Committee

Larry McVay

Audit Committee,
Nomination and
Governance Committee

Victoria Ossadnik

Audit Committee,
Compensation Committee

Martin Richenhagen

Compensation Committee,
Nomination and
Governance Committee

Robert Wood

Nomination and
Governance Committee
(Chairman),
Executive Committee

For more information about Linde's corporate governance,
please visit our website at **www.linde.com/about-linde/corporate-governance**

Sustainable Development

Best-in-class safety performance
4x better than U.S. Occupational Safety and Health Administration industrial average for lost workday case rate

Green H_2 supply to the world's first **H_2-powered ferry**

350,000 people benefited from employee **community engagement** projects

Enabled the **avoidance of >2x more GHG emissions** than were emitted in all of the company's operations

A leader in **Diversity & Inclusion**

Reduced **300 million gallons** of water in operations

Sourced **more than 1/3** of global electricity from **low-carbon sources**

Awards and Recognition

- Member of Dow Jones Sustainability™ World Index (DJSI world)
- Member of Bloomberg Gender-Equality Index (GEI)
- One of the World's Most Ethical Companies by Ethisphere Institute

2028 Sustainable Development Targets*

35 % reduction
in GHG emissions intensity

More than 1/3 of R & D budget
to decarbonization

Best-in-class
operational safety levels

30 % female
representation in the global workforce

450 zero waste
sites globally

550 community engagement projects
annually

50 % increase in philanthropy
towards environment

More than 2x low-carbon electricity
sourcing

* For more information about all Linde's SD 2028 targets, please visit our website at **www.linde.com/sustainable-development/targets-and-performance**

Mission, Vision and Values

Our Mission

We live our mission of **making our world more productive** every day. Through our high-quality solutions, technologies and services we are making our customers more successful and helping to sustain and protect our planet.

Our Vision

We are committed to fulfilling our vision to be the best performing global industrial gases and engineering company, where our people deliver innovative and sustainable solutions for our customers in a connected world.

Our Values

Safety

Integrity

Accountability

Inclusion

Community

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	**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	**+44 14 83 242200**
(Address of principal executive offices) (Zip Code)	**(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 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.

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:

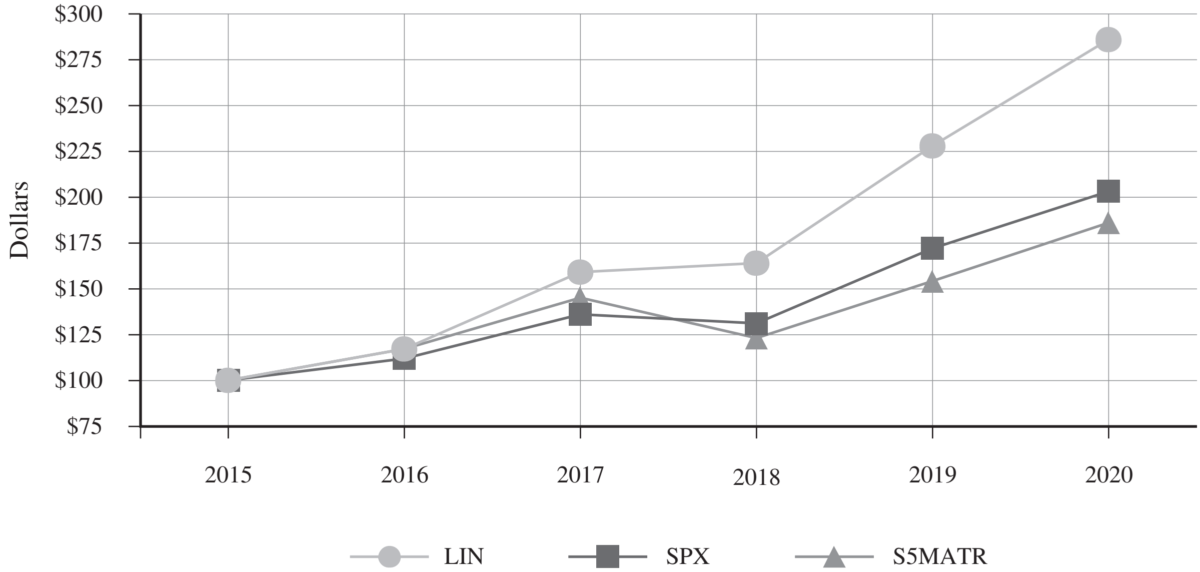
Period	Total Number of Shares Purchased *(Thousands)*	Average Price Paid Per Share	Total Number of Shares Purchased as Part of Publicly Announced Program (1) *(Thousands)*	Approximate Dollar Value of Shares that May Yet be Purchased Under the Program (2) *(Millions)*
October 2020	666	$ 230.39	666	$ 1,549
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.



	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.

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) **Year Ended December 31,**	**2020**	**2019**	**Variance 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) **Year Ended December 31,**	**2020**	**2019**	**Variance 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%	

	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) **Year Ended December 31,**	**2020**	**2019**	**Variance 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) **Year Ended December 31,**	2020	2019	Variance 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):

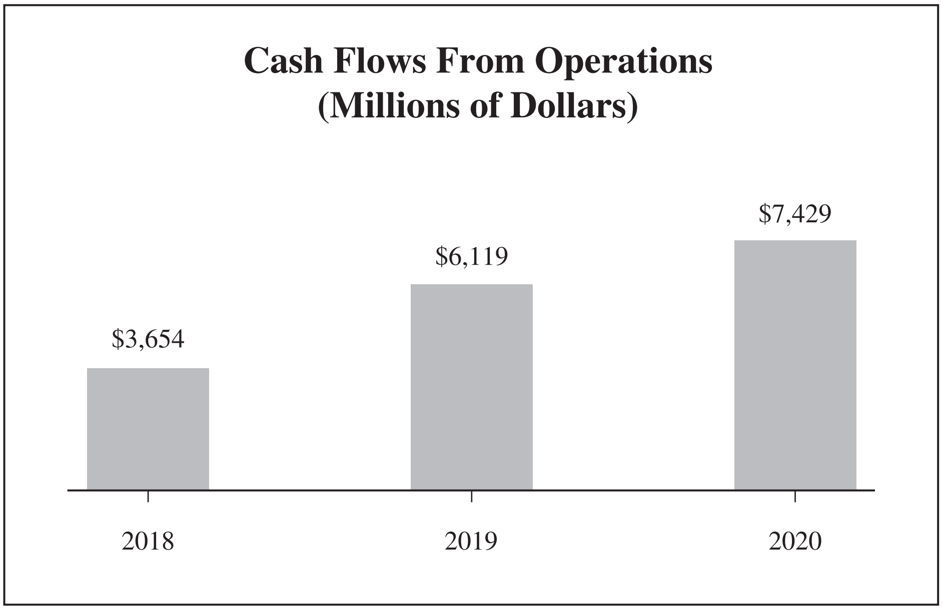
	Percent of 2020 Consolidated Sales	Statements of Income		Balance Sheets	
		Average Year Ended December 31,		December 31,	
Currency		**2020**	**2019**	**2020**	**2019**
Euro	22%	0.88	0.89	0.82	0.89
Chinese yuan	8%	6.90	6.90	6.53	6.96
British pound	6%	0.78	0.78	0.73	0.75
Australian dollar	4%	1.45	1.44	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

(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).

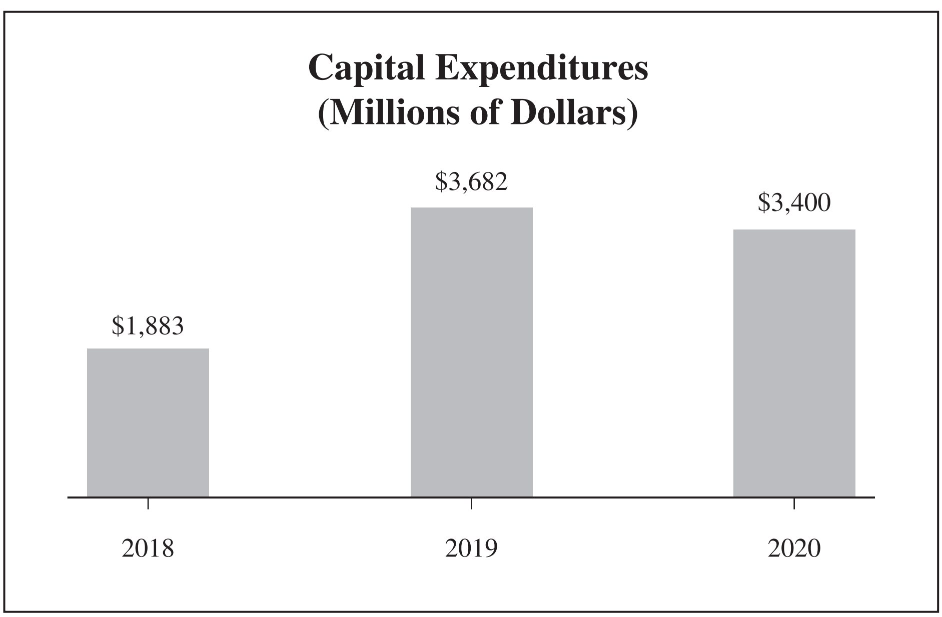
Cash Flows From Operations



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



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

(Dollar amounts in millions, except per share data)

Year Ended December 31,	**2020**	**2019**
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

(Dollar amounts in millions, except per share data)

Year Ended December 31,	**2020**	**2019**
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
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)	**Twelve Months Ended December 31, 2020**	**Twelve Months Ended December 31, 2019**
Statement of Income Data		
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

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 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		Additional Paid-in Capital	Retained Earnings	Accumulated Other Comprehensive Income (Loss) (Note 7)	Treasury Stock		Linde plc Shareholders' Equity	Noncontrolling Interests	Total Equity
Activity	**Shares**	**Amounts**				**Shares**	**Amounts**			
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)

	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

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	November 1, – December 31, 2018
Linde AG Results of Operations	
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

(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 $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

(Millions of dollars) December 31,	2020	2019
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

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.

(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		Level 2		Level 3	
	2020	2019	2020	2019	2020	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)	Pensions			OPEB		
Year Ended December 31,	**2020**	**2019**	**2018**	**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.

	Pensions					
(Millions of dollars)	2020		2019		OPEB	
AYear Ended December 31,	U.S.	International	U.S.	International	2020	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)

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:

	Pensions			
	2020		2019	
(Millions of dollars) **Year Ended December 31,**	**U.S.**	**International**	**U.S.**	**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.		International		OPEB	
	2020	**2019**	**2020**	**2019**	**2020**	**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

(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:

	Fair Value Measurements Using							
	Level 1		Level 2		Level 3 **		Total	
(Millions of dollars)	2020	2019	2020	2019	2020	2019	2020	2019
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).

Exhibit No.	Description
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).
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).

Exhibit No.	Description
*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).
*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).

Exhibit No.	Description
*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).

Exhibit No.	Description
*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 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 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 **Wolfgang Reitzle** ***Chairman***	/s/ STEPHEN F. ANGEL **Stephen F. Angel** ***Chief Executive Officer and Director***	/s/ MATTHEW J. WHITE **Matthew J. White** ***Chief Financial Officer***
/s/ PROF. DDR. ANN-KRISTIN ACHLIETNER **Ann-Kristin Achleitner** ***Director***	/s/ DR. CLEMENS BÖRSIG **Clemens Börsig** ***Director***	/s/ DR. NANCE K. DICCIANI **Nance K. Dicciani** ***Director***
/s/ DR. THOMAS ENDERS **Thomas Enders** ***Director***	/s/ FRANZ FEHRENBACH **Franz Fehrenbach** ***Director***	/s/ EDWARD G. GALANTE **Edward G. Galante** ***Director***
/s/ LARRY D. MCVAY **Larry D. McVay** ***Director***	/s/ DR. VICTORIA OSSADNIK **Victoria Ossadnik** ***Director***	/s/ PROF. DR. MARTIN H. RICHENHAGEN **Martin Richenhagen** ***Director***
/s/ ROBERT L. WOOD **Robert L. Wood** ***Director***		

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Ordinary Shares Listing (Symbol: LIN)
New York Stock Exchange
Frankfurt Stock Exchange
CUSIP: G5494J 103
ISIN: IE00BZ12WP82

Stock Transfer Agent and Stock Record Keeping
Computershare Trust Company, N.A. ("Computershare") is Linde's stock transfer agent and registrar, and administers all matters for shareholders of record.

For information about account records, stock certificates, change of address and dividend payments, contact: +1 866 201-5090 toll free and +1 781 575-2553 outside the United States or web.queries@computershare.com.

Website address:
www.computershare.com/investor
By mail, address shareholder inquiries to:
Computershare Investor Services
462 South 4th Street
Suite 1600
Louisville, KY, 40202
United States of America

Dividend Reinvestment Plan
Linde provides investors a convenient, low-cost program that allows dividends to be automatically reinvested into additional shares of Linde ordinary shares. Contact Computershare for full details.

For more information visit us online at www.linde.com

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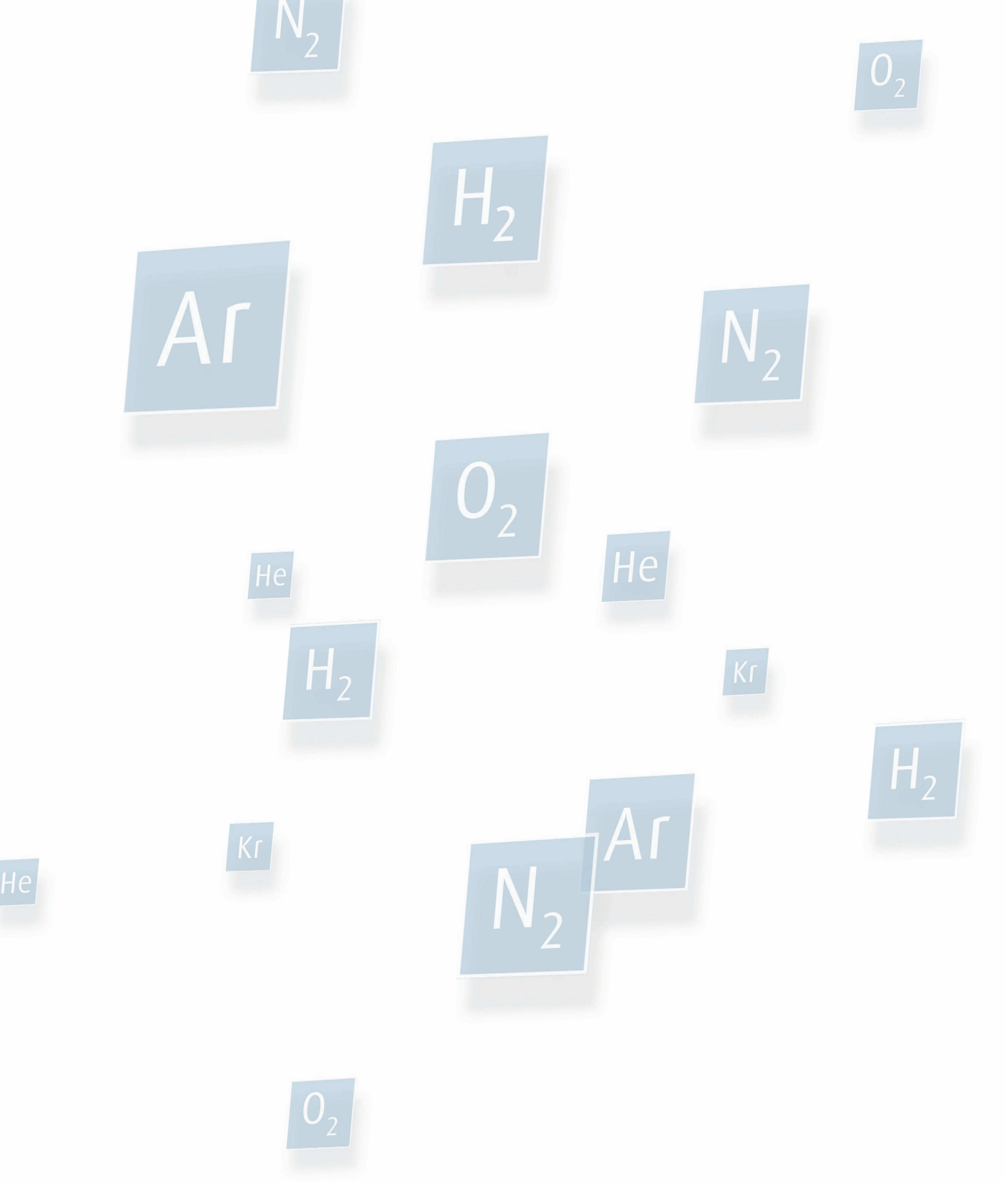

Linde plc
The Priestley Centre, 10 Priestley Road, The Surrey Research Park, Guildford, Surrey GU2 7XY, United Kingdom, www.linde.com