Welcome to your CDP Climate Change Questionnaire 2021

C0. Introduction

C0.1

(C0.1) Give a general description and introduction to your organization.

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 plc shares trade on the New York Stock Exchange (“NYSE”) and the Frankfurt Stock Exchange (“FSE”) under the ticker symbol "LIN". Linde issues an annual report 10K according to US GAAP and a Financial Report/Director’s Report according to IFRS, including a non-financial report following European CSR Directives 2014/95/EU and 2013/34/EU.

C0.2

(C0.2) State the start and end date of the year for which you are reporting data.

	Start date	End date	Indicate if you are providing emissions data for past reporting years	Select the number of past reporting years you will be providing emissions data for
Reporting year	January 1, 2020	December 31, 2020	Yes	2 years

C0.3

(C0.3) Select the countries/areas for which you will be supplying data.

Algeria
Argentina
Australia
Austria

Bahrain
Bangladesh
Belgium
Bolivia (Plurinational State of)
Brazil
Canada
Chile
China
Colombia
Costa Rica
Czechia
Denmark
Dominican Republic
Ecuador
Finland
France
Germany
Greece
Hungary
Iceland
India
Ireland
Italy
Japan
Luxembourg
Malaysia
Mexico
Netherlands
New Zealand
Norway
Panama
Paraguay
Peru
Philippines
Poland
Portugal
Puerto Rico
Republic of Korea
Romania
Russian Federation
Serbia
Singapore
South Africa
Spain
Sweden
Switzerland
Taiwan, Greater China

Thailand
Tunisia
Turkey
Ukraine
United Arab Emirates
United Kingdom of Great Britain and Northern Ireland
United States of America
Uruguay
Zambia
Zimbabwe

C0.4

(C0.4) Select the currency used for all financial information disclosed throughout your response.

USD

C0.5

(C0.5) Select the option that describes the reporting boundary for which climate-related impacts on your business are being reported. Note that this option should align with your chosen approach for consolidating your GHG inventory.

Financial control

C-CH0.7

(C-CH0.7) Which part of the chemicals value chain does your organization operate in?

Row 1

Bulk organic chemicals

Bulk inorganic chemicals

Hydrogen
Oxygen
Other industrial gasses

Other chemicals

Specialty chemicals

C1. Governance

C1.1

(C1.1) Is there board-level oversight of climate-related issues within your organization?

Yes

C1.1a

(C1.1a) Identify the position(s) (do not include any names) of the individual(s) on the board with responsibility for climate-related issues.

Position of individual(s)	Please explain
Board Chair	The Board of Directors, chaired by Linde's CEO, has responsibility for climate-related issues. How the individual's responsibility is related to climate: The Board, under the chair's leadership, approved the company's SD 2028 targets, which include several climate change targets, and at least annually, the Board reviews Linde's performance against its SD targets, including its climate targets. The Board also reviews issues on sustainability topics, including climate-related topics such as Linde's clean hydrogen and decarbonization strategies, at least quarterly. The Board also is responsible for reviewing safety and environmental risk, including water-related risk, at each Board meeting. In addition, the Board has established a strategic business objective to maintain best-in-class performance in environmental responsibility. Annual payout of executive variable compensation partly depends on performance in this area, which includes achievement of the SD water management target. Climate-related decision: In 2020, the full Board, under the chair's leadership, approved Linde's new 10-year Climate Change and Sustainable Development (SD 2028) targets, which include a target to develop water management plans at sites in water-stressed areas.

C1.1b

(C1.1b) Provide further details on the board's oversight of climate-related issues.

Frequency with which climate-related issues are a scheduled agenda item	Governance mechanisms into which climate-related issues are integrated	Please explain
Scheduled – some meetings	Reviewing and guiding strategy Reviewing and guiding major plans of action Reviewing and guiding risk management policies	Sustainable Development including climate-change is overseen by the Board and Linde's executive leadership and integrated throughout the company. The COO or EVP Clean Energy report to the Board at least quarterly on climate-related topics like Linde's hydrogen strategy or Linde's overall decarbonization strategy.

	Monitoring implementation and performance of objectives Monitoring and overseeing progress against goals and targets for addressing climate-related issues	Climate-related issues have been a topic at 80% of Board meetings held in 2020. Examples: in January 2020, the Linde Board reviewed and approved Linde's 10-year Sustainable Development Targets. In fall 2020, the Executive Vice President heading the Clean Hydrogen organization briefed the Board about the general trends and business outlook related to clean hydrogen and the implications for Linde. In early 2021, Linde's COO briefed the Board on Linde's performance against the company's 2028 sustainable development targets. Performance against those targets are reviewed at least annually by the full Board of Directors. In addition, the Board reviews safety and risk matters at each meeting, these include climate change risks such as the impacts of extreme weather such as flooding and hurricanes. The Linde Board maintains oversight of the company's values and strategy. Each year, it conducts a comprehensive long-term strategic review of the company's outlook and business plans and provides advice and counsel to management regarding the company's strategic issues. The Board has confirmed the importance of setting non-financial objectives as part of variable compensation to reinforce leadership's focus on maintaining a culture that supports both short- and long-term sustainable results. It has established non-financial goals with respect to elements such as safety, environmental responsibility including climate change, global compliance, productivity and talent management. These measures are described in Linde's April 2021 proxy statement.

C1.2

(C1.2) Provide the highest management-level position(s) or committee(s) with responsibility for climate-related issues.

Name of the position(s) and/or committee(s)	Responsibility	Frequency of reporting to the board on climate-related issues
Chief Operating Officer (COO)	Both assessing and managing climate-related risks and opportunities	Quarterly

C1.2a

(C1.2a) Describe where in the organizational structure this/these position(s) and/or committees lie, what their associated responsibilities are, and how climate-related issues are monitored (do not include the names of individuals).

Where in the org structure the position lies: Linde's Chief Operating Officer is the highest-ranking executive officer responsible for sustainability, including climate change. He is a member of the Office of the Chairman and reports directly to the CEO. Linde's EVP, Clean Energy, is responsible for sustainability and reports to the COO.
Why responsibilities for climate change have been assigned to this position: Linde's Chief Operating Officer is leading the Operating Segments (EMEA, Asia, Americas) and is globally responsible for Applications Technology, Sustainable Development, Clean Energy, and Digitalization. The COO is the position with ultimate responsibility for climate change because climate change, like other sustainable development issues, are integral to Linde's operations. The COO has oversight over all key aspects of operations.
Specific responsibilities of the COO with regard to assessment and management of climate-related issues: Under the COO's direction, Linde routinely conducts sensitivity analyses for operational risk. For example, Climate Change Risks, including risks from natural disasters, are routinely assessed and mitigation actions identified. In addition, the EVP, Clean Energy, and the Senior Director, Sustainability, monitor climate-related issues, including by regularly tracking and reporting to the COO on progress against Linde's 2028 sustainable development targets, which include several targets related to energy and climate change. Responsibility for achieving these targets rests with the businesses. Progress against Linde's main climate change targets are reported monthly to the full leadership and executive team. Operational targets relating to climate change are reported by all businesses monthly against the targets into the Centers of Excellence and to the CSO. Close monitoring of the achievement of these targets provides regular insight into the company's overall performance in the areas of energy management, GHG emissions intensity, the amount of renewable energy sourced, the benefits to customers in reducing their GHG emissions from the use of Linde products and applications, and the amount of revenue the company earns from products with climate change and other environmental and health benefits. These targets directly address the key climate-related risks and opportunities identified by Linde's Board of Directors in the 2020 Annual Report (10k) as material to the business.

C1.3

(C1.3) Do you provide incentives for the management of climate-related issues, including the attainment of targets?

	Provide incentives for the management of climate-related issues	Comment
Row 1	Yes	

C1.3a

(C1.3a) Provide further details on the incentives provided for the management of climate-related issues (do not include the names of individuals).

Entitled to incentive	Type of incentive	Activity inventivized	Comment
Corporate executive team	Monetary reward	Emissions reduction target Energy reduction target Efficiency target	The Board has confirmed the importance of setting nonfinancial objectives as part of variable compensation to reinforce leadership's focus on maintaining a culture that supports both short- and long-term sustainable results. It has established non-financial goals with respect to elements such as safety, environmental responsibility, global compliance, productivity and talent management. These measures are described in Linde's April 2021 proxy statement. Annual pay-out of executive variable compensation depends on performance in several strategic non-financial areas, including best-in-class performance in safety, environmental responsibility (including meeting climate change targets), global compliance, productivity and talent management. At the end of the year, management presented to the Compensation Committee the degree of achievement in meeting each goal, and for each element, provided its view of the relative degree of importance to long term success. Based on the results, the Compensation Committee determined that the Company's performance with respect to the strategic and non-financial goals was favorable and set the Corporate strategic and non-financial payout factor at 160% of target variable compensation (relative to a 200% maximum). Examples of actions in determining 2020 variable compensation pay-outs included receiving recognition on the DJSI World Index and developing over $ 100 million in decarbonization projects in EMEA region.

C2. Risks and opportunities

C2.1

(C2.1) Does your organization have a process for identifying, assessing, and responding to climate-related risks and opportunities?

Yes

C2.1a

(C2.1a) How does your organization define short-, medium- and long-term time horizons?

	From (years)	To (years)	Comment
Short-term	0	2	
Medium-term	2	5	
Long-term	5	100	

C2.1b

(C2.1b) How does your organization define substantive financial or strategic impact on your business?

When evaluating the potential impact of risks and the expected probability of their occurrence, Linde uses a standard scale devised by the corporate risk management department. This scale has four different risk ratings ranging from low risk to very high risk. Each risk is assigned a risk rating on this standard scale based on its potential impact and probability.
Risks with the highest potential impact (severity) rating are classified as significant (substantive) risks. Those substantive risks, together with their probability of occurrence, are presented in detail to top management on a regular basis.

When analyzing the impact of the risk, Linde considers not only the impact on the financial results of operations, but also the impact on non-monetary aspects such as safety, environment, reputation and strategy.

Monetary aspect: Example: Substantive financial impact includes, for example, the replacement cost of a single production facility, which could be more than $30 million.

Non-monetary aspects: Risks which could cause considerable harm to people or the environment (e.g., loss of life) are considered substantive, regardless of their monetary impact.

C2.2

(C2.2) Describe your process(es) for identifying, assessing and responding to climate-related risks and opportunities.

Value chain stage(s) covered

Direct operations
Upstream
Downstream

Risk management process

Integrated into multi-disciplinary company-wide risk management process

Frequency of assessment

More than once a year

Time horizon(s) covered

Short-term
Medium-term
Long-term

Description of process

The Linde risk management department is responsible for devising a standardized Linde-wide risk management process. Those with local responsibility for risk in the operating units are responsible for the implementation of this standard process.

Risk identification:
The management team of each operating unit within Linde identifies the main risks affecting that unit. In addition, global functions are asked to report risks affecting their area of responsibility. When identifying risks, a great variety of areas, both internal and external, are taken into consideration. The areas covered by the risk assessments include internal processes and resources; the economic, financial, legal and regulatory environment; and social and ecological aspects including risks resulting from climate change. The risk management process allows for reporting of short-term risks, as well as risks with a medium- or long-term horizon and impact.

With regards to climate change, Linde has defined 4 risk areas: regulatory risks, market risks, reputational risks and physical risks. Several risks have been reported in each of those risk categories by our local entities which are stored in the central risk database for further tracking.

Risk assessment (Risk analysis and evaluation):
The executives in the various units categorize each risk they have identified and evaluate it in terms of criteria determined centrally, including the potential impact of the risk on Linde and the estimated probability of its occurrence. When analyzing the impact of the risk, Linde considers not only the impact on the financial results of operations, but also the impact on non-monetary aspects such as safety, environment, reputation and strategy. When evaluating the potential impact of risks and the expected probability of their occurrence, the operating units use a standard scale devised by the central risk management department. This scale has four different risk ratings ranging from low risk to very high risk. Each risk is awarded a risk rating on this standard scale based on its potential impact and its probability. Risks with the highest potential impact (severity) rating are classified as significant risks. Those significant risks, including their probability of occurrence, are presented in detail to top management on a regular basis.

Risk treatment/mitigation:
For each risk, the next step is to plan the measures which can be taken to manage the risk, so that the risk may be reduced to an acceptable level. The management of the risk comprises a selection or a combination of measures to avoid risk, transfer risk, reduce risk and control risk. For each risk, responsibility for the risk is assumed by an individual

appointed by management. This person then assesses the risk on a regular basis and monitors any measures taken to manage the risk.

Risk reporting:
The operating units as well as global functions record the information gathered by the risk management process in the central risk management database and ensure that their risks and risk treatment plans are kept up-to-date and that significant emerging risks are recorded. Throughout the year, a summary of risks is presented on a regular basis to the regional heads and once a year to the full management committee as well as the Board of Directors. Company Risks are described in Linde's 2020 Annual Report (10k) which covers, for example, risks from the supply of energy and from natural catastrophes, such as extreme weather.

For its new set of sustainable development targets which run from 2018-2028, Linde performed a full sustainable development materiality assessment (SDMA). One important input into this process as an internal driver are company risks, among those risks related to climate change. An output from the SDMA were Linde's 4 Priority Factors, among those is "Climate Change". Linde's new 2028 sustainable development targets are ultimately derived from those priority factors and address all relevant risks related to climate change.

The assessment and response to climate related opportunities is primarily steered by Linde's central innovation department and the central strategy department. Input from regional departments (e.g., from sales or marketing departments) is integrated in the global process. Linde's strategy department is regularly assessing market trends and customer behavior and requirements and sharing those with the central innovation department. The innovation department is elaborating and proposing solutions which address those changed market conditions and customer behavior. Those solutions are first discussed within the R&D and innovation department and strategy department. Material issues/innovations that tackle important market trends/new requirements are proposed to the management committee on a regular basis.

Case study (physical):
In Linde's 2020 Q2 risk update, about 15 specific risks related to physical impact from climate change were identified, which either concern single plants or a larger location/area which includes several plants/businesses. Those risks received different risk ratings from low to high severity & from low to high probability. Based on this input, risk from natural disaster has been classified as one of Linde's top risks due to the high potential financial impact such a risk could have in certain exposed areas (approx. $100 million, worst-case; extremely low probability) and further negative aspects, e.g., potential loss of life. This risk has also been presented to the Board of Directors during the regular Global Risk Review. Decisions on proposed risk mitigation actions have been taken/confirmed that will help Linde further reduce the adverse impacts of such a risk on Linde's operation and financial results in the future. One example for such risk mitigation action: establish specific flood level standards & raise critical equipment to meet these standards in order to reduce risk from flooding in exposed areas.

Case study (transition):
Linde’s strategy department has over the last years carried out observations and analysis about trends with regards to the future of hydrogen. It has gathered external input/studies on market trends and analyzed multiple external public sources and papers (e.g., hydrogen outlook from hydrogen council) relating to perspectives on how the demand for green hydrogen could develop. The outcome of this analysis was presented to the newly-formed Linde management committee in 2019. Green hydrogen was presented as a key opportunity for Linde. Top mgmt decision was made to take further action in this area, which resulted, among other things, in the establishment of a new clean hydrogen organization and formulation of some of Linde’s new 2028 targets, relating to R&D spending in the area of decarbonization as well as investments in low-carbon/hydrogen projects & activities. Those actions will help Linde realize its opportunities in the area of green hydrogen.

C2.2a

(C2.2a) Which risk types are considered in your organization's climate-related risk assessments?

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	Linde's 2020 Annual Report (10k) identifies governmental regulations as a risk in Section 1A Risk Factors. This risk was identified as part of the annual company-level risk assessment process. Linde is subject to regulations in a number of areas such as environmental protection, including climate change. Violations of these laws could result in substantial penalties or sanctions. Therefore, Linde assesses risks associated with both current and emerging regulations. For example, certain Linde sites are subject to the EU Emission Trading Scheme cap and trade program. Legislation that limits GHG emissions may impact growth by increasing capital, compliance, operating and maintenance costs and/or decreasing demand.
Emerging regulation	Relevant, always included	Linde's 2020 Annual Report (10k) identifies governmental regulations as a risk in Section 1A Risk Factors. This risk was identified as part of the annual company-level risk assessment process. Linde is subject to regulations in a number of areas such as environmental protection, including climate change (for example, certain Linde sites may become subject to the carbon tax that will come into force in China after 2020). Legislation that limits GHG emissions may impact growth by increasing capital, compliance, operating and maintenance costs and/or decreasing demand. Violations of these laws could result in substantial penalties or sanctions. Therefore, Linde assesses risks associated with both current and emerging regulations.

Technology	Relevant, always included	Linde's 2020 Annual Report (10k) identifies technological advances as a risk in Section 1A Risk Factors. This risk was identified as part of the annual company-level risk assessment process. If Linde fails to keep pace with technological advances in the industry, including those related to the transition to a low carbon economy, customers may not continue to buy the company's products and results of operations could be adversely affected. Therefore, Linde assesses risks related to both R&D (incl. in decarbonization) and changing customer behavior (e.g., increasing demand for low carbon products), and actively works to drive innovation and increase revenue from products that bring customers or end-user environmental or social benefit.
Legal	Relevant, always included	Linde's 2020 Annual Report (10k) identifies litigation and governmental investigations as a risk in Section 1A Risk Factors. This risk was identified as part of the annual company-level risk assessment process and includes all types of litigation, including those related to environmental regulations such as compliance with GHG reporting and emissions trading laws. The outcome of a litigation action may adversely affect the company's financial results. Linde's subsidiaries are party to various lawsuits and governmental investigations arising in the ordinary course of business. We consider legal risks in our climate risk assessment, but we view legal risks as they relate to climate change to be minimal. We have not experienced and do not anticipate legal actions related to climate change to have a substantive impact on operations.
Market	Relevant, always included	Markets for sourcing raw materials and energy: Linde's 2020 Annual Report (10k) identifies the cost and availability of raw materials and energy as a risk. This risk was identified as part of the annual company-wide risk assessment process. 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 its financial condition or results of operations. 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 the company's ability to meet contractual supply commitments. Change in end markets: Linde's 2020 Annual Report (10k) identifies external market risks that could arise as a consequence of upcoming climate change legislation, that Linde cannot influence. This includes changing customer and competitor behavior and risks from potential structural changes in end markets due to changing behavior of market participants. These risks were identified as part of the annual company-wide risk assessment process. If Linde fails to keep pace with technological advances in the industry, including those related to the transition to a low carbon economy, customers may not continue to buy the company's products and results of operations could be adversely affected. Therefore, Linde constantly assesses risks related to both R&D and changing customer and market behavior (e.g., increasing demand for low carbon products), and actively works to drive innovation and increase revenue from its eco and social product portfolio.
Reputation	Relevant, always included	Linde's 2020 Annual Report (10k) identifies shifts in consumer preferences as a risk in Section 1A Risk Factors. This risk was identified as part of the annual company-level risk assessment process. If Linde fails to keep pace with technological advances in the industry, including those related to the transition to a low carbon economy, this could have an adverse effect on Linde's reputation and customers may not continue to buy the company's products anymore. Thus, results of operations could be adversely affected. Linde constantly assesses risks related to both R&D and changing customer behaviour (e.g., increasing demand for low carbon products), and actively works to drive innovation and increase revenue from products that bring customers or end-users environmental or social benefit. We continuously monitor evolving attitudes toward climate-related issues and the associated expectations that may impact how Linde's actions and products are viewed.
Acute physical	Relevant, always included	Linde's 2020 Annual Report (10k) identifies catastrophic events such as extreme weather including hurricanes and floods, as a risk in Section 1A Risk Factors. This risk was identified as part of the annual company-level risk assessment process. The occurrence of catastrophic events or natural disasters, such as hurricanes and floods, 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. At an asset level, risks to physical assets (such as facilities over a certain size) are evaluated by external risk assessors to assess vulnerability to risks from severe weather, and the potential monetary risk.
Chronic physical	Relevant, always included	Linde's 2020 Annual Report (10k) identifies catastrophic events such as extreme weather as a risk in Section 1A Risk Factors. This risk was identified as part of the company-level risk assessment process. The occurrence of catastrophic events, such as chronic extreme weather events (e.g., extreme drought), 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. A detailed technical and commercial evaluation of the impacts of rising ambient temperature on our production plants was carried out, with a special focus on changes in energy demand. The SHEQ team is integrating this tool into their pre-investment environmental assessments of asset-level capital projects.

C2.3

(C2.3) Have you identified any inherent climate-related risks with the potential to have a substantive financial or strategic impact on your business?

Yes

C2.3a

(C2.3a) Provide details of risks identified with the potential to have a substantive financial or strategic impact on your business.

Identifier

Risk 1

Where in the value chain does the risk driver occur?

Direct operations

Risk type & Primary climate-related risk driver

Emerging regulation

Carbon pricing mechanisms

Primary potential financial impact

Increased direct costs

Company-specific description

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. U.S. EPA has 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, GHGs are regulated in the European Union under the Emissions Trading System, which has wide implications for the company's customers and impacts certain Linde operations in Europe. Climate change and energy efficiency laws and policies are also being widely introduced in jurisdictions throughout South America and parts of Asia. China is going to launch a national carbon emissions trading system in 2021. Linde anticipates continued growth in its hydrogen business. Hydrogen production plants and a large number of other manufacturing and electricity-generating plants are regulated in California and the European Union as a source of carbon dioxide emissions, and Linde plants are subject to cap-and-trade regulations in those jurisdictions.

Legislation that limits GHG emissions may impact growth by increasing operating costs and/or decreasing demand for Linde's traditional business lines. Among other impacts, such regulations are expected to raise the costs of energy which is Linde's most significant direct cost item, with the risk that such cost increases might not be fully passed through to customers.

Company specific example/details: In 2020, 9% (1.48 million tons) of Linde's scope 1 emissions were located in countries where there is some form of carbon taxation or trading scheme applicable to Linde's business. This led to a higher cost (of energy) for Linde or its customers. A majority of those emissions (over 85%) were subject to the EU ETS certificate scheme. Cost of EU ETS certificates in 2020 varied between $23 and $37. There is a general upward trend in the price of certificates. Other locations where Linde is obliged to pay carbon taxes include Singapore and California (U.S.).

Time horizon

Short-term

Likelihood

More likely than not

Magnitude of impact

Low

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

74,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

Among other impacts, cap and trade schemes, ETS schemes and carbon taxes are expected to raise the cost of energy, either directly or indirectly, which is a significant cost for Linde.

Linde expects that such schemes will be established in the coming years in many parts of the world and in Linde's major markets. In the next 1-2 years, new carbon tax or cap and trade schemes will start worldwide which are expected to impact Linde plants – like the new German BEHG or the UK ETS. At the same time cost of existing carbon taxation schemes are increasing, like the price for the EU ETS certificate.
In order to calculate the gross financial impact from this risk, Linde assumes in the short term an average carbon tax/fee of $48 per ton of CO2. This is calculated based on the outlook for carbon prices for the schemes applicable to Linde in the near term. The amount is mainly impacted by the price for the EU carbon certificate as this applies to a majority of Linde emissions currently affected by carbon legislation (compare chapter 11). The EU ETS certificate price has considerably increased during the last year and – according to Reuters - is expected to further increase to over € 46 /$55 in 2021. For some new GHG regulations carbon prices are not yet published. For those Linde considers for its calculations information from public media such as Financial Times about the future pricing.

Linde expects that an amount of 1,540,000 tons of emissions could be subject to carbon taxation in the short term. This takes into consideration the tax schemes emerging as well as constant improvements in GHG intensity (see target section C4.1).

$48 times 1,540,000 tons of emissions = $73,920,000 which were rounded to 74 million of potential carbon-related fees.

Due to the additional carbon tax schemes arising and carbon prices increasing for existing legislations, the estimate of the gross financial impact shown above is higher than reported in the previous year.

The provided financial impact is the theoretical gross impact before any mitigation actions/risk response (like free allowances).

Cost of response to risk

100,000

Description of response and explanation of cost calculation

To manage risks from current and potential GHG emissions regulation, Linde actively monitors regulatory developments, increases relevant resources and training as needed; consults with vendors, insurance providers and industry experts; incorporates

GHG provisions in commercial agreements; conducts regular sensitivity analyses of the impacts of potential energy and raw material cost increases; analyses different potential GHG tax regimes; and explores renewable energy options.
Linde's commercial contracts routinely provide rights to recover increased energy and related costs that are incurred by the company. Linde estimates that in a majority of cases the price increases incurred by carbon legislation can be passed on to customers over Linde’s standard contracts.

Additionally, Linde focuses on innovation, operational productivity and energy efficiency and has targets to reduce scope 1 and 2 emissions intensity and therefore minimize the impact of increased carbon costs.

Finally, for certain carbon trading systems Linde receives allowances covering a specific amount of certificates required. As those allowances are not certain and the amount is not determined yet (esp. for EU ETS) those are not deducted from the gross risk amount.

Considering the above mitigation actions, the residual financial impact of this risk on Linde is considered to be low.

On top of internal resources managing those GHG related topics, Linde spends approximately $100,000 per year for external consultancy and service providers in this area. This figure was not calculated – it is the sum of expenses paid to service providers.

Case Study: After the merger Linde wanted to merge legacy strategies and therefore developed a combined climate change strategy. The strategy was designed to keep Linde in a leading position in terms of both providing climate change solutions to its customers as well as reducing its own carbon footprint. A Climate Change Council was established to evaluate Linde’s carbon footprint and project GHG emissions growth to 2050. The result of this work was the creation of 2028 climate change targets, which Linde’s Board approved in early 2020. Those aim to limit Linde’s GHG emission intensity, which reduces the exposure to carbon-limiting regulations and resulting on-cost. In 2020, Linde made progress against this target: GHG intensity was reduced 16.5% compared to 2018, due in part to a reduction of absolute scope 1 and 2 emissions by 2 million tons of CO_2e.

Comment

Identifier

Risk 2

Where in the value chain does the risk driver occur?

Direct operations

Risk type & Primary climate-related risk driver

Acute physical

Increased severity and frequency of extreme weather events such as cyclones and floods

Primary potential financial impact

Decreased revenues due to reduced production capacity

Company-specific description

Linde plants might be affected by major catastrophic weather events.

The occurrence of catastrophic events or natural disasters such as extreme weather, including hurricanes and floods, could disrupt or delay Linde's ability to produce and distribute its products to customers and could potentially expose the company to third-party liability claims. In addition, such major events could impact Linde's customers and suppliers potentially resulting in long-term outages and/or the limitation of supply of energy or other raw materials used in normal business operations. Such extreme events may also lead to damage to property, plant and equipment, additional repair/maintenance costs, and/or additional capital expenditures.

The company has significant assets in areas that are subject to extreme weather events that may be exacerbated by climate change, particularly in the U.S. Gulf Coast, in Mexico, and certain portions of Asia. For example, Linde operates several air separation units, large steam methane reformers and PSA units at the Gulf of Mexico, from where it sells bulk/merchant products over trucks, but also provides gases products which are transported over pipelines to customers. A severe natural disaster at that location like earthquake and/or flooding could cause significant damage to Linde’s plant operating equipment as well as gases pipelines. In addition, significant damage to customer facilities could lead to plant shutdowns that may result in reduced sales to customers.

The impact of such major events can be between medium to high depending on the severity of the event. In the worst case there could be loss of lives involved.

Time horizon

Short-term

Likelihood

Unlikely

Magnitude of impact

Medium-high

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

100,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

The reported financial impact figure is gross (before mitigation activities) and based on a low probability scenario of a major natural disaster of high severity, which could cause considerable damage to one or several plants in that area and lead to considerable down time of up to one year.

Based on evaluations from insurance companies regarding such major events, e.g., flooding, it is estimated that such an event could lead to about 100,000,000 of financial impact for a plant of average size or a plant cluster in an exposed area. This includes operating cost and capital to restore the plant itself, as well as lost revenues which represent the major part of the impact.

Based on a specific disaster plan/scenario for one of Linde's major plants, it is estimated that 20% of financial impact ($20 million) would be due to damage to property, plant and equipment and to restore the plant; and the rest ($80 million) would be lost business/revenues. Lost revenues are calculated based on the assumption of a downtime of one year, which is the amount of time needed to bring the plant back into working condition after a major natural disaster. One year is considered realistic, as it may take 1-2 months for repair work to begin (e.g., after a major flood), and there can be long procurement lead times to order high value replacement parts/components, which then need to be installed, tested, etc.

Cost of response to risk

200,000

Description of response and explanation of cost calculation

To manage these risks, Linde evaluates direct and indirect business risks through business impact analysis, then establishes appropriate priorities and policies; invests in facilities with suitably resilient design and technology; consults with vendors, insurance providers and industry experts; and conducts regular reviews of the business risks with management.

Asset level risks are assessed during project development using documented procedures and criteria. Linde also has a Business Continuity Planning process through which businesses can evaluate their operational assets and develop plans that can be implemented in the event of an impairment of the asset.

Finally, Linde works with its insurance provider to evaluate the risk from all perils including natural hazards such as extreme weather, or flooding. The insurer uses rigorous standards to identify and quantify exposures to Linde assets. Based on their recommendations, Linde may make investments in infrastructure that adapts to or mitigates risks from climate change.

Linde currently procures risk transfer insurance from highly rated insurance companies for catastrophic claims in excess of $5M in total property damage. The company also secures risk transfer insurance coverage for any business interruption.

Cost Breakdown: Linde annually spends in excess of $20,000 above normal business costs to study its natural catastrophe risk. The risk analysis service provides, among other items, detailed evaluations by geography of emerging hurricane and flooding vulnerability and likelihood of incidence of extreme weather. In addition, Linde spends annually $180,000 for a Loss Control Program which includes 20 surveys per year by risk engineers from the leading insurer. $20,000 + $180,000 = $200,000

Case Study: Hurricane Harvey hit the Gulf Coast in 2017 and caused minor damage and shut-downs for some Linde plants in that area (ASU plants and one hydrogen plant) while one PSA plant in Texas was severely impacted due to flooding, with several months of downtime. As an adaptation measure the plant was afterwards rebuilt to withstand similar type of flooding that occurred during Harvey. To mitigate damage from flooding and high winds, Linde worked with its insurance providers and plant engineering team to come up with new resilient design standards. Some of Linde’s plants built in the last years were constructed to withstand winds of 118 mph and critical equipment is raised to specific flood level standards.

Comment

Identifier

Risk 3

Where in the value chain does the risk driver occur?

Downstream

Risk type & Primary climate-related risk driver

Market

Changing customer behavior

Primary potential financial impact

Decreased revenues due to reduced demand for products and services

Company-specific description

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.

Currently, the world is in a transition towards a low-carbon future and companies worldwide are investing in research and development of new low-carbon technologies, which will over time replace conventional fossil-fuel based technologies. Linde already offers several applications which help its customers reduce their GHG emissions, such as oxygen in steel manufacturing for more efficient burners. , or producing hydrogen for use in ultra-low sulfur fuel, which decreases GHG emissions from diesel consumption in vehicles with diesel particulate filters.

However, these applications have been available for some time, and innovation is needed to accelerate the transition to a low carbon future. One such area of innovation is green hydrogen, which is considered a key technology/product on the way to a low carbon economy.

Linde today is generating over $2 billion in revenues from hydrogen-related products. Linde estimates that due to future increasing demand for especially green hydrogen, its annual revenues from hydrogen products could quadruple in the medium-long term.

If Linde fails to develop and provide hydrogen products and solutions requested by customers or falls behind (from a timing perspective) on what competitors are offering, or if products are not price competitive, there is a risk that those additional revenues will not be generated, which would have an adverse impact on Linde’s future growth.

Company specific example:
Linde is taking steps into the green hydrogen transition, e.g. by collaborating with partners. The company for example signed an MOU with China Power to develop green hydrogen energy in China. Also, since beginning of 2021, Linde is partnering with Hyosung Corporation (Hyosung), one of South Korea's largest industrial conglomerates, to build, own and operate extensive new liquid hydrogen infrastructure in South Korea.

Time horizon

Long-term

Likelihood

Unlikely

Magnitude of impact

Medium-high

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

6,000,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

Linde’s CEO Steve Angel estimates that Linde’s hydrogen sales could quadruple in the future, from a current revenue base of over $2 billion in hydrogen-related revenues per year. $2 billion times 4 = $8 billion ultimate annual revenues. $8 billion minus $2 billion current revenue/baseline = $6 billion. This is the potential additional revenues that could be generated from new hydrogen opportunities per year (in the long term).

If Linde fails to provide the hydrogen solutions required by customers or is not competitive, then it will not generate the additional $6 billion in potential annual revenues in the long term, and therefore, in the worst case, this would have a negative financial implication (decrease in revenues) compared to the expected future scenario, which assumes those $6 billion of additional revenues.

The financial impact figure is a gross amount before any mitigation/counter actions.

Cost of response to risk

64,000,000

Description of response and explanation of cost calculation

Linde is at the forefront of innovation for new technologies like CCS or hydrogen applications. Linde was a founding member of the Hydrogen Council (where Steve Angel serves on the Board) and takes part in other relevant H2 initiatives and pilot projects like the initiative “Hydrogen Forward”, a coalition led by 11 companies committed to working with stakeholders to advance hydrogen for a cleaner and stronger US economy.

In addition, Linde has formed a new clean energy organization and defined climate change targets including R&D and investments for innovation, which includes hydrogen applications.

Furthermore, Linde is looking for collaboration and partnerships in the area of R&D, in order to stay a leader in new technologies, ahead of competition (e.g., through joint ventures like Linde ITM Electrolysis).

Linde believes that with the current strong focus on R&D and innovation and upcoming new project opportunities it will successfully realize the expected growth opportunities in this new business area.

Explanation of cost calculation:
Linde has set an objective to invest over $1 billion in low carbon projects that benefit Linde or its customers. The figure of $ 1 billion is a cumulative amount over 10 years and includes Linde's investments in hydrogen technologies and projects, in order to realize its hydrogen opportunities and keep pace with developments in this area. Under “cost of response to risk” Linde discloses the average annual cost to respond to this risk: Linde invested $66 million in 2019 and $62 million in 2020 in low-carbon projects (see also performance versus targets in section C4), therefore $128 million in 2 years, equalling $64 million per year.

Case study: To fulfil the growing demand for green H2, Linde seeks additional green H2 capacity to deliver a higher volume. Linde today operates more than 80 electrolysis plants worldwide. Linde recently announced that it will build, own and operate the world's largest PEM (Proton Exchange Membrane) electrolyzer plant at the Leuna Chemical Complex in Germany. The new 24-MW electrolyzer will produce green H2 to supply Linde's industrial customers through the company's existing pipeline network. In addition, Linde will distribute liquefied green H2 to refueling stations and other industrial customers in the region. The green H2 being produced can fuel app. 600 fuel cell buses, driving 40 million kilometers and saving up to 40,000 tons of carbon dioxide tailpipe emissions per year.

Comment

Identifier

Risk 4

Where in the value chain does the risk driver occur?

Direct operations

Risk type & Primary climate-related risk driver

Market

Uncertainty in market signals

Primary potential financial impact

Increased direct costs

Company-specific description

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.

Total energy cost account for between 25-30% of annual operating expenditure. For ASU operations energy cost normally account for 60-80% of plant expenditures.

Linde ASUs operate at a steady optimized rate, according to customer contractual demand. ASU operations are therefore subject to risks from high electricity prices during peak times.

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, energy price volatility could increase in the future at either existing or new plants, which may not be reflected fast enough in Linde's sales prices, with the consequence of decreasing profits and customer margins.

Company specific example/case study: Energy prices for many of Linde's US plants vary hourly based on the energy mix. If, for example, a larger proportion of the power mix is coming from renewable energy sources this can lead to short term spikes in power cost in excess of 100% due to variability of wind and solar performance. This can have a negative impact on Linde's operating profit if Linde is not able to fully pass through those costs to customers.

Time horizon

Short-term

Likelihood

More likely than not

Magnitude of impact

Low

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

200,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

Linde's current annual energy costs are more than $4 billion. The above risk amount is calculated using the assumption that energy cost could increase by 5%, due to increasing price volatilities in liberalized markets and changes in regulation in regulated markets. 5% of $4 billion = $200 million.

The financial impact figure is a gross amount before any mitigation actions.

Cost of response to risk

200,000

Description of response and explanation of cost calculation

Linde performs long-term assessments of energy supply cost and reliability when making capital investment decisions to help manage the risk of energy supply and cost volatility, which are material to the internal rate of return and net present value of capital investment projects. Linde also includes escalation and pass-through clauses in many customer contracts to recover energy and feedstock costs.

Linde tries to counter such risks from increasing price volatility in different ways:

- Gain information about changes in regulation and energy prices fast enough in order to react accordingly, by monitoring of political developments, and fostering dialogue with relevant political stakeholders
- Participation in working groups and councils of relevant industry groups and business associations
- Negotiate power purchase contracts with reliable energy cost which then form part of customer contracts
- Manage customer contracts and price escalations in a way to be able to recover short-term price increases/fluctuations of energy cost. This sometimes means re-negotiation of existing contracts.
- Linde pursues energy efficiency, invests in renewable energy PPAs and direct supplier contracts and has energy and GHG targets to mitigate risks related to energy cost and availability.

Beyond internal resources managing energy prices and price volatility, Linde spends approximately $200,000 per year for external consultancy, service providers, legal advisory or participation in (industrial) associations in this area. This figure was not calculated – it is the sum of expenses paid in the past.

Case study: Energy prices are subject to short-term spikes resulting from a higher mix of renewables in the power mix for many of Linde's air separation units in the US. These spikes can lead to higher energy prices for these plants. Linde is mitigating this risk by, for example, maintaining sufficient product storage from low-price energy periods to use in times of higher energy prices. Linde furthermore includes escalation and pass-through clauses in many customer contracts to recover increases in energy cost, including short-term price volatility. As a result, impact on operating profit from energy price fluctuations is kept low.

Comment

C2.4

(C2.4) Have you identified any climate-related opportunities with the potential to have a substantive financial or strategic impact on your business?

Yes

C2.4a

(C2.4a) Provide details of opportunities identified with the potential to have a substantive financial or strategic impact on your business.

Identifier

Opp1

Where in the value chain does the opportunity occur?

Downstream

Opportunity type

Products and services

Primary climate-related opportunity driver

Development and/or expansion of low emission goods and services

Primary potential financial impact

Increased revenues resulting from increased demand for products and services

Company-specific description

Linde sees opportunities to benefit from governmental regulation of GHG and other emissions and the increasing demand for low-carbon applications. Hydrogen is a key enabler of the clean energy transition. It is a versatile, clean, and safe energy carrier that can be used as fuel for power or in industry as feedstock. It can be produced from (renewable) electricity and from carbon-abated fossil fuels. It produces zero emissions at point of use. It can be stored and transported at high energy density in liquid or gaseous form. It can be combusted or used in fuel cells to generate heat and electricity.

We are at the beginning of this transition. Conventional processes still dominate in refining, chemical production and other sectors (steel, electronics, space). However, R&D and emerging technologies are starting to change the landscape. We can envision a future where hydrogen fuel cells will be widely adopted; green electricity will be available commercially on a large scale; and energy and fuel markets will be linked. Under this scenario, low-carbon hydrogen would be cost competitive; SMRs would feature additional energy efficiency and CCS; and electrolysis would be available with renewable electricity sources at much greater capacities and would supply a significant share of new hydrogen demand.

Hydrogen is among Linde's biggest growth opportunities and leveraging hydrogen's capacity to enable the clean energy transition is a key platform in Linde's commitment to mitigate Climate Change.

Linde today is generating over $ 2 billion in revenues from hydrogen-related products. Linde estimates that due to future increasing demand for especially green hydrogen, its annual revenues from hydrogen products could quadruple in the medium-long term.

Company specific examples: Linde is a global leader in hydrogen with over 190 H2 fueling stations installed, servicing cars, trucks, buses and trains; participation in forward-looking projects and initiatives, such as Hydrospider, Hydrogen Forward and H2 Mobility; 80+ electrolysis plants for hydrogen production; first commercial high-purity H2 cavern – now in operation for over 10 years; largest Power-to-X energy park in Mainz, Germany; and participation in numerous flagship projects. Linde recently announced that it will build, own and operate the world's largest PEM (Proton Exchange Membrane) electrolyzer plant (24 MW) at the Leuna Chemical Complex in Germany.

Time horizon

Long-term

Likelihood

More likely than not

Magnitude of impact

High

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

6,000,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

Linde's revenue from hydrogen-related products today is more than $2 billion, and with the amount of investment being proposed in the industry globally – in excess of $100 billion – Linde could ultimately quadruple the size of its hydrogen business in the mid- to long term. Considering existing revenue from hydrogen is $2 billion, this would mean additional annual revenues of $6 billion in the long term, e.g., by new technologies like electrolysis to generate green hydrogen.

Financial Impact Figure Calculation: Current revenue from H2 of $2 billion quadrupled (x 4) = $8 billion. The additional sales opportunity is $8 billion minus the $2 billion in current revenue = $6 billion/year in the long term.

Cost to realize opportunity

64,000,000

Strategy to realize opportunity and explanation of cost calculation

Linde has Sustainable Development targets in place to invest >$1 billion in decarbonization projects and spend at least 1/3 of its annual R&D budget on decarbonization by 2028.

Linde is a global leader in hydrogen and clean hydrogen and a founding member of the Hydrogen Council. Furthermore, Linde launched a new Clean Hydrogen organization to focus and accelerate activity in this area.

The company is investing across the hydrogen value chain to accelerate the clean energy transition with a higher global renewable power mix and significant operating and capital efficiencies. We will pursue competitive low-carbon sources of hydrogen, including energy efficient SMRs with carbon dioxide capture, electrolysis with renewable power, and piloting new low-carbon technologies.

Case study: Today, Linde operates more than 80 electrolysis plants worldwide. Linde is looking to create additional green hydrogen capacity to deliver a higher volume of green hydrogen and accelerate the clean energy transition. To accomplish this, Linde looks to invest in and/or partner with other companies where there is an opportunity to combine Linde's world-class engineering capabilities with green hydrogen production methods such as electrolysis technology. In 2019, Linde acquired a minority stake in ITM Power, a leading provider of electrolyser solutions/plants, and formed the joint venture ITM Linde Electrolysis, to explore large-scale electrolysis applications. The JV will create capacity to deliver a higher volume of projects, shorten lead times, improve execution and reduce costs, and increase revenue.
Since beginning of 2021, Linde is partnering with Hyosung Corporation (Hyosung), one of South Korea's largest industrial conglomerates, to build, own and operate extensive new liquid hydrogen infrastructure in South Korea. This robust hydrogen network will support the country's ambitious decarbonization agenda to achieve net zero emissions by 2050.

Explanation of cost calculation: Linde intends to invest >$1 billion in decarbonization projects. The figure of $ 1 billion is cumulative over 10 years and includes Linde's investments in hydrogen technologies and projects. Under "cost to realize opportunity" Linde discloses the average annual cost. In 2019, the investment in decarbonization projects was $66 million of which investments in Linde's hydrogen strategy was a large portion. In 2020, Linde invested $62 million, the 2-years average is therefore $ 64 million.

Comment

We believe that Hydrogen will continue to enable industrial and environmental benefits, including in refining and chemical production. Our products and applications, including Hydrogen, enable our customers to avoid 85 million MT of CO_2e annually – that's more than twice as much GHG avoided than emitted from all our operations.

Identifier

Opp2

Where in the value chain does the opportunity occur?

Downstream

Opportunity type

Markets

Primary climate-related opportunity driver

Access to new markets

Primary potential financial impact

Increased revenues through access to new and emerging markets

Company-specific description

Changes in precipitation extremes are leading to water shortages, especially in mega-cities where there are population pressures. This in turn leads to stricter regulation of water quality, as we are seeing in emerging economies such as China. This presents a market opportunity for Linde to increase revenue in countries such as China through access to new markets as we develop and deliver customized systems to help industrial plants and municipalities meet their wastewater management goals. We work directly with our customers to provide beginning-to-end treatment methods, from needs assessment and treatment strategy to equipment design, installation and industrial supply. We offer a wide range of applications that treat and reuse process water, all while maximizing treatment capacity, reducing VOC emissions, improving safety and reducing costs.

For example, Linde's SOLVOCARB® product line has been developed as a reliable and safe solution to meet neutralisation and remineralisation needs across a broad application spectrum from wastewater to drinking water . The SOLVOCARB venturi is a low pressure drop gas-liquid venturi contactor that provides excellent bubble distribution for effective gas dissolution.

Also, as the global demand for potable water continues to rise and fresh water supplies are quickly depleting, we are advancing industrial technology to make this life-sustaining resource accessible to a growing population. Last year alone, we helped bring clean drinking water to more than 200 million people around the world.

Time horizon

Short-term

Likelihood

More likely than not

Magnitude of impact

Low

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

4,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

The potential financial implications can be calculated from the size of the market and the size of Linde's opportunity. The major factors driving the industrial wastewater treatment market include depleting freshwater resources and stringent regulations pertaining to emission and treatment of industrial waste. According to the new market research report, "Industrial Wastewater Treatment Market by Type (Coagulants, Flocculants, Biocides & Disinfectants), End-Use Industry (Power Generation, Mining, Chemical) and Region (APAC, Europe, North America, MEA, South America) - Global Forecast to 2024", published by MarketsandMarkets™, the Industrial Wastewater Treatment Market is expected to grow from USD 11.3 billion in 2019 to USD 15.0 billion by 2024, at a CAGR of 5.8%. Wastewater treatment is an important end market for Linde and represented a market opportunity of about $70 million in 2019. Assuming a CAGR of 5.8% this equates to about $4 million in growth per year ($70 million x 5.08% = $4,060,000, which we rounded to $4 million).

Cost to realize opportunity

0

Strategy to realize opportunity and explanation of cost calculation

Linde's water technology offerings are supported by a business development group, which is actively investing in innovation and business development.

Case study: Increased urbanization and urban populations growth have exerted significant pressure on urban water demand and expansion of urban water infrastructure. Investments are needed to modernize water infrastructure in many urban areas around the world. Municipalities are seeking solutions to improve water quality. Linde identified the need for its water applications in San Antonio, Texas. The San Antonio Water System (SAWS) in Texas recently signed three long-term gas supply agreements with Linde. In 2019, two contracts were signed to use CO2 for lime softening in drinking water treatment. In 2020, Linde signed a long-term supply agreement for CO2 to be used in desalination in the US. Those plants help to mitigate water shortages and, by diversifying water sources, support the cities' sustainable development efforts.

Water applications are an important area within Linde's eco and social product portfolio (products which bring environmental or social advantages to customers). Linde defined a target that Linde’s sustainability portfolio should exceed 50% of annual sales revenues (excl. Linde Engineering), 2018-2028. In 2020, Linde's sustainability portfolio was 54% of revenue or $13.1 billion.

By setting a target for our sustainability portfolio, Linde is able to increase the likelihood and magnitude of our opportunity to increase demand for products and applications that help companies manage changes in precipitation extremes.

Comment

There was zero additional cost for actions taken, outside of regular budgeted staff and business costs in this area, including for R&D. A portion of the total R&D expenditure in 2020 ($152 million) went to develop the applications and processes described in this section.

Identifier

Opp3

Where in the value chain does the opportunity occur?

Downstream

Opportunity type

Products and services

Primary climate-related opportunity driver

Shift in consumer preferences

Primary potential financial impact

Increased revenues resulting from increased demand for products and services

Company-specific description

The effects of climate change are increasingly visible on the environment, society and the global economy. Linde expects that in the future demand for products that offer social and environmental benefits will grow, especially in the area of climate change / low-carbon solutions.

Linde has the technology, the resources and the people to help address climate change. Through our high-quality solutions, products, technologies and services, we are already making our customers more successful and helping to sustain and protect our planet. For example, Linde's oxygen helps steelmakers save energy, allows sustainable aquaculture to thrive and serves hundreds of thousands of patients needing respiratory oxygen. Its hydrogen helps oil refiners to make ultra-low sulfur diesel (ULSD) which helps improve air quality, thereby improving the environment and human health. Linde's high-performance surface coatings help improve energy efficiency in jet engines and machine turbines. These applications represent an important portion of Linde's sustainability portfolio which also includes further solutions and applications to bring ecological and social advantages to customers.

To support the shift in consumer preferences to low carbon solutions and the corresponding increase in demand for the products offered in our sustainability portfolio, we set a target to grow this portfolio. The target is to annually exceed 50% of annual sales revenues (excl. Linde Engineering), 2018-2028. In 2020, our sustainability portfolio was 54% of revenue or $13.1 billion.

Time horizon

Short-term

Likelihood

More likely than not

Magnitude of impact

Medium

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

122,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

The potential financial implications can be calculated based on an assumption of Linde's top line growth and the target that the sustainability portfolio contributes to 50% of the revenue. 50% of $ 24.4 billion (Linde revenue excluding Linde Engineering) = $ 12.2 million. If Linde's top line grows 1% per year then this equates to about $122 million of growth in revenue per year from Linde's sustainability portfolio (1% of $12.2 billion = 122 million).

Cost to realize opportunity

40,000,000

Strategy to realize opportunity and explanation of cost calculation

Linde is actively investing in innovation and business development in order to meet customer demand for products with a lower carbon footprint and other projects which bring social and economic benefits.

Linde's Global Commercialization organization raises awareness of applications within our sustainability portfolio across a broad range of markets and regions. We further raise awareness by providing information about such products on our website. For example, our White Papers are available including the impact of oxygen on reducing CO2 emissions in blast furnace ironmaking; see https://www.linde.com/about-linde/sustainable-development/climate-change.

Linde continuously seeks ways to increase the sustainability portfolio. A large portion of Linde's annual R&D budget is dedicated to such applications which offer ecological and social benefits for customers. For example, Linde established a target to spend at least 1/3 of its annual R&D budget on decarbonization by 2028. This includes green hydrogen technologies and CCUS. In 2020, Linde's sustainability portfolio was 54% of revenue, or $13.1 billion, and 26% of the 2020 R&D budget was on decarbonization efforts. This focus on environmental innovation is yielding positive market results.

Case Study: Linde has a target that its sustainability portfolio - applications that bring customers sustainability benefits - should exceed 50% of annual revenue (excluding Linde Engineering). Linde's eco-portfolio includes applications such as oxygen for blast furnaces in steel; hydrogen for ultra-low sulfur diesel (ULSD); and oxygen and carbon dioxide for wastewater treatment, desalination and aquaculture. This target helps Linde ensure that the company is able to meet increasing customer demand for low carbon products. By working towards the sustainability portfolio target, Linde is able to increase the likelihood and magnitude of our opportunity to meet consumers' demands for climate friendly products and applications. We expect these opportunities to materialize regularly, as we are constantly looking for ways to increase our sustainable growth portfolio.

Explanation of Cost Calculation: At least 26% of the total R&D expenditure in 2020 ($152 million) went to develop the applications and processes described in this section (26% of $152 million = $40 million).

Comment

C3. Business Strategy

C3.1

(C3.1) Have climate-related risks and opportunities influenced your organization's strategy and/or financial planning?

Yes, and we have developed a low-carbon transition plan

C3.1a

(C3.1a) Is your organization's low-carbon transition plan a scheduled resolution item at Annual General Meetings (AGMs)?

	Is your low-carbon transition plan a scheduled resolution item at AGMs?	Comment
Row 1	No, and we do not intend it to become a scheduled resolution item within the next two years	Linde continues to maintain a strong dialogue with investors and other stakeholders regarding its climate change strategy and low-carbon initiatives and has implemented a comprehensive governance structure including Board supervision for those issues. Therefore, Linde does not believe that it is necessary for shareholders to vote on a low carbon transition plan at the AGM.

C3.2

(C3.2) Does your organization use climate-related scenario analysis to inform its strategy?

Yes, qualitative and quantitative

C3.2a

(C3.2a) Provide details of your organization's use of climate-related scenario analysis.

Climate-related scenarios and models applied	Details
IEA B2DS IEA Sustainable development scenario Other, please specify Company-specific GHG mitigation scenarios	Linde is aligned with the Paris Accord and evaluated multiple scenarios, including IEA's sustainable development scenario (SDS) and B2DS, that are consistent with limiting global warming to well below 2 degrees C. Using these, Linde developed several company-specific GHG mitigation scenarios to assess transition risks and opportunities, and to analyse specific actions needed to achieve the desired GHG emissions reduction. Below we describe how we applied SDS in our analysis: The time horizon considered for the scenario analysis was through 2050. Our analysis considers Linde's specific short and mid-term business outlook in its main operating areas and longer-term outlook based on average growth projected for the world economy. Linde used assumptions and projections mainly from the SDS, outlined in IEA's latest ETP paper. Those projections include the growth of green, blue (CCUS) and grey hydrogen demand and an outlook for the de-carbonization of the power sector. The scope of Linde's scenario analysis and climate risk assessment included its industrial gases operations, which contribute to a majority of scope 1 and 2 emissions; it did not include GHG emissions from engineering or healthcare business segments which have a very small GHG footprint. Linde also investigated how transition risks could affect its customers and key end markets. Results of the scenario analysis: Linde found that its targets and strategies are well aligned with the projections of the SDS and therefore a well below 2 degrees scenario. The SDS projects chemical sub-sector emissions to grow for the next 5-7 years due to worldwide business growth and new technologies still scaling up, but then to decline, reaching close to zero by 2070. Linde likewise expects its emissions to grow in the near-term, before impacts of large-scale clean hydrogen production and green power will bring absolute emissions down. The SDS predicts blue and green hydrogen to represent >80% of worldwide H2 production by 2050. Linde is already pursuing ambitious growth strategies for green and blue H2 in line with these projections, including partnerships for research and development (e.g., with ITM Power). Linde also concluded that a more ambitious scenario like a 2050 net zero scenario is possible technology-wise, however would require strong regulatory drivers through taxes or incentives for GHG mitigation, to justify or compensate the significant Capex investments needed for widespread deployment of low-

	carbon technologies (e.g., to retrofit a majority of H2 production with CCS). Additional preconditions would be a faster decarbonization of the power sector and availability of negative emissions technologies to offset certain hard to abate emissions. Impact on Linde's business strategy: Linde's business strategy and management decisions are aligned with the Paris agreement and the GHG pathway as outlined in the SDS. Linde has set rigorous targets for efficiency as well as for investments in decarbonization R&D and commercial decarbonization projects till 2028 and will continue to pursue such developments beyond 2028. Linde management was informed about the outcome of the scenario analysis and its technological and financial implications. This information is being considered in strategic decisions regarding future technology development and investments. Case Study: Linde wanted to implement measures to better track the impact of business decisions on its (future) GHG footprint. It has therefore decided to implement climate related KPIs into each new investment decision at top management level to better track the impact of business decisions on its GHG emissions. Furthermore, Linde has implemented a shadow carbon price to inform investment decisions. The result of those measures is a better ability to steer the company towards the aspired GHG pathway, with greater awareness of the risks and opportunities of each new investment project and business decision.
RCP 2.6 RCP 4.5	Linde used scenario analysis as part of its climate risk assessment to analyse potential long-term physical risks from climate change. Linde evaluated several public scenarios and selected the RCP 2.6 and 4.5 scenarios as a basis for its risk assessment. Both scenarios are aligned with Linde's aspiration to contribute to limit global warming to below 2 degrees, whereas the RCP 4.5 is the more conservative scenario. The scope of Linde's scenario analysis and risk assessment was its industrial gases (IG) business which represents 83% of the company's revenues and 100% of its production assets. The focus was on the long-term (20-30 years), as this is the time horizon when physical effects from climate change will become most evident. This covers the lifetime of Linde's production plants which usually have a contractual run time of 15-20 years. Linde looked at its own operations and didn't consider upstream or downstream risks. Linde is aware that physical risks from climate change are also going to impact its suppliers and customers and will extend its analysis to those stakeholders in a next step. The risk analysis was conducted on a single asset basis, covering the majority

	of assets, e.g., Linde evaluated which sites will be exposed to high water stress in the next 20 years according to different future climate scenarios. Linde furthermore developed a tool to calculate the impact of climate variables like temperature and ambient contaminants (e.g., ppm CO_2) on its plant operations (e.g., impact on energy consumption/cost). Results of the scenario analysis: Based on the evaluation of scenarios, Linde decided that the RCP 4.5 scenario is the most appropriate to assess potential risks and define mitigation actions for those, as this scenario is more conservative, but still allows to keep global warming at 2 degrees. Linde's scenario analysis showed that Linde might be exposed to several acute and chronic physical climate change risks in the long term, resulting e.g., from an increase in mean temperature, higher CO_2 concentration in the air, or higher water stress. This could lead to higher operating cost, and in the worst case loss of revenue due to reduced production capacity. For example, by 2040 20% additional sites could see an increase in their baseline water stress to high or extremely high, among others plants at the China Coast. Impact on Linde's business strategy: Management was informed about the outcome of the risk analysis. As a result, mitigation strategies were defined to address the particular risks, for specific assets and regional areas. Linde's adaptation plan covers Linde's IG business representing 100% of the company's production assets. It includes contingency plans, required plant upgrades due to changing physical conditions, and long-term activities related to R&D and innovation (e.g., new water solutions). Generally, for all new plants the physical parameters are assessed, and it is ensured that plant designs are meeting the current and future regional climate risks, e.g., higher risk of flooding. Linde therefore doesn't expect any significant plant adaptation measures to become necessary in the mid-term. If however changes in local climate parameters occurred which are outside the operating conditions of the plant, the plant needs to be upgraded. Such circumstances are rather to be expected for the longer term (+10 years) for which physical parameters are hard to predict. Case Study: Linde wanted to improve plant designs to better withstand risks from climate change. Temperature and ppm CO_2 concentration are base operating conditions of a production plant. Thus, Linde evaluated the impact on a plant of potential increases in CO_2 concentration under different climate scenarios. As a result of the analysis, Linde plants are now being designed to work under conditions meeting the climate pathway projected by the RCP 4.5 scenario, while also considering specific local climate conditions.

C3.3

(C3.3) Describe where and how climate-related risks and opportunities have influenced your strategy.

	Have climate-related risks and opportunities influenced your strategy in this area?	Description of influence
Products and services	Yes	Linde is a technology leader and at the forefront of innovation in many technology areas, including low-carbon products and services. How climate related risks and opportunities have influenced Linde's business strategy: Linde believes that it can benefit from business opportunities arising from governmental regulation of GHG and other emissions and the increasing demand for low-carbon products and applications. Linde offers several products and applications that help customers and their clients avoid CO2 emissions, such as oxygen used in steelmaking and hydrogen used to make ultra-low sulfur diesel. These products and applications help customers mitigate the risk from GHG regulations/taxes. Linde's strategy is to maintain its focus on such offerings in the short, mid and long term. For example, Linde has set a 10-year managed target to have over 50% of annual sales (excl. Linde Engineering) realized by products from its sustainability portfolio, among those products that decrease the carbon footprint of customers. In 2020, 54% of Linde's sales revenues were realized from that product portfolio. In addition, Linde has set targets to invest in R&D related to low-carbon products and applications and to invest >$1 billion by 2028 in low carbon projects. Case study of a substantial strategic decision influenced by climate-related risks and opportunities: Linde has investigated which technologies are best for answering the world's growing demand for low carbon products and applications and found that hydrogen is seen as one key enabler of the transition to a low-carbon economy. Linde expects a strong increase in demand for especially green hydrogen in the mid and long term and has therefore decided to focus its strategy on this growing business area (green hydrogen). Linde recently established

		an internal hydrogen organization and entered into multiple collaborations as well as carried out strategic investments to speed up developments and growth in the area of green hydrogen. For example, Linde recently announced that it will build, own and operate the world's largest PEM (Proton Exchange Membrane) electrolyzer plant at the Leuna Chemical Complex in Germany. The new 24-megawatt electrolyzer will produce green hydrogen to supply Linde's industrial customers through the company's existing pipeline network.
Supply chain and/or value chain	Yes	From a supply chain perspective, Linde sees little impact from climate change on Linde’s raw material supply, other than for energy – which is reported under “Operations”. From a value chain perspective, Linde needs to respond to changes in customer behavior and offer products and services which help customers to become more successful and productive. How climate related risks and opportunities have influenced Linde’s business strategy: Linde believes that it can benefit from business opportunities arising from governmental regulation of GHG and other emissions and the increasing demand for low-carbon products and applications. Linde already offers several products and applications that help customers and their clients avoid CO_2 emissions, such as oxygen used in steelmaking and hydrogen used to make ultra-low sulfur diesel. These products and applications help customers mitigate the risk from GHG regulations/taxes. Linde’s strategy is to maintain its focus on such offerings in the short, mid and long term. For example, Linde has set a 10-year managed target to have over 50% of annual sales realized by products from its sustainability portfolio, among those products that decrease the carbon footprint of customers. In 2020, 54% of Linde’s sales revenues were realized from that product portfolio. In addition, Linde has set targets to invest in R&D related to low-carbon products and applications and to invest >$1 billion by 2028 in low carbon projects. Case study of a substantial strategic decision related to its value chain (customers) influenced by climate-related risks and opportunities: Linde has investigated which technologies are best for

		answering the world's growing demand for low carbon products and applications and found that hydrogen is seen as one key enabler of the transition to a low-carbon economy. Linde expects a strong increase in demand for green hydrogen in the mid and long term and has therefore decided to focus its strategy on this growing business area (green hydrogen). Linde recently established an internal hydrogen organization and entered into multiple collaborations as well as carried out strategic investments to speed up developments and growth in the area of green H2. For example, Linde recently announced that it will build, own and operate the world's largest PEM (Proton Exchange Membrane) electrolyzer plant (24 MW).
Investment in R&D	Yes	Linde is a technology leader and at the forefront of innovation in many technology areas, including in low-carbon products and services. How climate related risks and opportunities have influenced Linde's business strategy: Linde believes that it can benefit from business opportunities arising from governmental regulation of GHG and other emissions and the increasing demand for low-carbon products and applications. Linde already offers several products and applications that help customers and their clients avoid CO2 emissions, such as oxygen used in steelmaking and hydrogen used to make ultra-low sulfur diesel. These products and applications help customers mitigate the risk from GHG regulations/taxes. Linde's strategy is to continue to focus on such offerings in the short, mid and long term. E.g., Linde has set a 10-year managed target to annually earn >50% of sales from products from its sustainability portfolio, among which are products that decrease the carbon footprint of customers. In 2019, 53% of Linde's sales revenues were earned from its sustainability portfolio. In addition, Linde has set targets to invest more than one third of annual R&D expenditures in low-carbon projects and initiatives by 2028, and to invest >$1 billion by 2028 in low carbon projects. Case study of a substantial strategic decision influenced by climate-related risks and opportunities: Linde has investigated which technologies are best for answering the world's growing demand for low carbon products and applications and found that hydrogen is seen

		as one key enabler of the transition to a low-carbon economy. Linde expects a strong increase in demand for especially green hydrogen in the mid and long term and has therefore decided to focus its strategy and R&D/innovation efforts on this growing business area (green hydrogen). Linde has recently established an internal hydrogen organization and entered into multiple collaborations as well as carried out strategic investments to speed up developments and growth in the area of green hydrogen. For example, Linde recently announced that it will build, own and operate the world's largest PEM (Proton Exchange Membrane) electrolyzer plant at the Leuna Chemical Complex in Germany. The new 24-megawatt electrolyzer will produce green hydrogen to supply Linde's industrial customers through the company's existing pipeline network.
Operations	Yes	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. Legislation that limits GHG emissions may impact growth by increasing raw material costs and/or decreasing demand. Among other impacts, such regulations are expected to raise the costs of energy, with the risk that such cost increases might not be fully passed through to customers. In order to reduce the risk from increasing GHG regulation and thus increasing energy cost, Linde has set several managed targets among its new 2028 sustainability targets. Linde overall aims to reduce its GHG (scope 1 and 2) over EBITDA intensity by 35% by 2028. Case study: Improvements in operational efficiencies are an important lever to reduce energy consumption and thus scope 1 and scope 2 emissions. This led to the development of 10-year managed targets that were approved by Linde's Board in early 2020. As part of its climate change targets Linde has set targets for efficiency improvements in several areas. For example, Linde plans to reduce its ASU energy efficiency by 7% and its Hyco GHG intensity by 4% over the 10-year target horizon. In addition, absolute scope 1 emissions from other GHGs are planned to be reduced by 10% by 2028. These targets have a baseline of 2018, and in 2020, Linde made progress against each of these targets. For example, HYCO efficiency improved 7.1% compared to the baseline of 2018.

		Another important lever to reduce energy consumption is low carbon electricity. Linde has set a 10-year target to double the amount of low-carbon electricity sourced, especially through active procurement of renewable electricity. This will lead to changes in the energy supply of the company which will look to source more power from renewable sources (different utility providers) or power which is backed up by RE certificates. In 2020, low carbon electricity procured increased from 15.5 to 16.4 TWh. As a result, Linde expects its emission intensity to further decrease (already decreased by 16% in 2020 compared to 2018) and therefore a decreased risk from emission regulations.

C3.4

(C3.4) Describe where and how climate-related risks and opportunities have influenced your financial planning.

	Financial planning elements that have been influenced	Description of influence
Row 1	Revenues Direct costs Indirect costs Capital expenditures	Revenues: Linde believes that it can benefit in the mid and long term from the higher demand for low-carbon products and applications needed to transition to a low-carbon economy. Linde is factoring in the impact of business opportunities from new low-carbon products and applications into its mid and long-term business plan. Linde has a target to realize at least 50% of annual revenues (excluding Linde Engineering) from its sustainability portfolio through 2028, including low carbon products and services. This is considered in the annual business plan (revenue). Case Study: Hydrogen is seen as one key technology/product to enable the transition to a low carbon economy. Linde believes that it will be able to quadruple its sales of hydrogen-related products and applications in the long term, due to the increasing demand for (green) hydrogen. Linde is currently generating over $2 billion in revenues with hydrogen and hydrogen applications per year. We expect this to increase to $8 billion by 2028. Direct Cost: Cost of energy: Current and emerging GHG regulations are influencing

		Linde's operating cost / cost of energy. Linde takes into account for its annual budget / financial planning the amount of carbon taxes or carbon credits to be purchased for existing production plants and plants starting operation in the budget year which are or will be subject to carbon taxation. If such fees and charges can be passed through to the customer (e.g., over the sales price) Linde is also considering this in the financial planning (increased sales revenues). Case Study: Linde needs to include in its annual budgets the expected cost from carbon legislation/taxation or trading schemes. For example, Linde is including cost estimates for the EU ETS fourth trading period (starting in 2021) and the expected level of allowances into its 2021 budget, as well as an estimate for the new German BEHG (fuel emission trading law) which will go beyond emissions covered under the EU ETS scheme. Linde believes that it will be able to pass on the majority of those cost to customers, therefore the impact on the financial plan is both on the cost side, but also on the revenue side. Indirect Cost: Linde is an innovation leader. In order to stay ahead of competitors and offer the (low carbon) products and services required by customers, Linde constantly needs to invest in R&D. Linde has a target that by 2028, >30% of its annual R&D expenses will be directed to new technologies and especially low-carbon applications. The amount of R&D expenses required in those areas is planned every year as part of the annual R&D budget. Case Study: In order to foster developments in the low-carbon area to respond to increased customer demand, Linde has set a target to dedicate more than 1/3 of its annual R&D budget towards low carbon projects by 2028. In 2020 Linde spent 26% of its total annual R&D budget ($152 million) on decarbonization topics. The R&D expenses for low-carbon developments/innovations were factored in as part of the annual budgeting process into Linde's annual budget. Capital Expenditures: Linde thinks it can benefit from increasing demand for low-carbon products and applications. In order to be able to provide such applications, in addition to R&D, capital investments are required, e.g., pilot production plants for testing new applications or investing in know-how, e.g., by acquisitions of technology companies, in order to step into new innovation areas. Linde takes into account required capital expenditures (CAPEX) for such activities into its short-, mid- and long-term CAPEX planning process. Case Study: Linde has set a target to invest >$1 billion into low carbon

		projects by 2028 and is on track to achieve this target. Linde recently announced that it will build, own and operate the world's largest PEM (Proton Exchange Membrane) electrolyzer plant at the Leuna Chemical Complex in Germany. The new 24-megawatt electrolyzer will produce green hydrogen to supply Linde's industrial customers through the company's existing pipeline network. In 2019 and 2020, Linde invested on average $64 million in decarbonization projects/initiatives. The CAPEX required for such projects/initiatives are factored into the overall annual CAPEX planning/budget of the company.

C3.4a

(C3.4a) Provide any additional information on how climate-related risks and opportunities have influenced your strategy and financial planning (optional).

We believe that the chemical industry has a key role to play in achieving the objective of limiting global warming to below 2 degrees Celsius. Linde is among the biggest industrial gases companies worldwide and a leader in innovation. It has the technology, the resources and the people to help address climate change. For more than 100 years, we have been providing solutions to help solve global energy challenges. We are proud to play an active role in the global energy transformation.

We are at the brink of this transformation. The long-term effects of carbon-based fuels on the environment and climate require significant changes to the energy supply chain. We can envision a future where hydrogen fuel cells will be widely adopted; green electricity will be easily available commercially; and energy and fuel markets will be linked. Under that scenario, low-carbon hydrogen would be cost competitive; SMRs would feature additional energy efficiency and carbon capture; and electrolysis would be available with renewable electricity sources at much greater capacities and supply a significant share of new hydrogen demand.

Tackling climate change is a shared and global responsibility. Linde plans to participate in investments and technologies that will reduce global GHG emissions. As a leading industrial gases and engineering company, we have the technology, the resources and the capability to contribute across all aspects of managing climate change and reducing GHG emissions.

C4. Targets and performance

C4.1

(C4.1) Did you have an emissions target that was active in the reporting year?

Intensity target

C4.1b

(C4.1b) Provide details of your emissions intensity target(s) and progress made against those target(s).

Target reference number
Int 1

Year target was set
2019

Target coverage
Company-wide

Scope(s) (or Scope 3 category)
Scope 1+2 (market-based)

Intensity metric
Other, please specify
Million metric tons of CO2e per EBITDA in billion USD

Base year
2018

Intensity figure in base year (metric tons CO2e per unit of activity)
5.2

% of total base year emissions in selected Scope(s) (or Scope 3 category) covered by this intensity figure
100

Target year
2028

Targeted reduction from base year (%)
35

Intensity figure in target year (metric tons CO2e per unit of activity) [auto-calculated]
3.38

% change anticipated in absolute Scope 1+2 emissions
17

% change anticipated in absolute Scope 3 emissions
0

Intensity figure in reporting year (metric tons CO2e per unit of activity)
4.3

% of target achieved [auto-calculated]
49.4505494505

Target status in reporting year
Underway

Is this a science-based target?

Yes, we consider this a science-based target, but it has not been approved by the Science Based Targets initiative

Target ambition

Well-below 2°C aligned

Please explain (including target coverage)

During 2019, Linde defined its new 10-year climate change targets to address its energy and GHG intensity. Those targets run against a 2018 pro forma baseline.

In order to show GHG efficiency against a business denominator, Linde selected the adjusted pro forma EBITDA, which is one of the non-GAAP measures reported by Linde plc. It reflects the size of the business for which the emissions are being reported and the efficiency improvements that are being targeted. Adjusted pro forma EBITDA is a non-GAAP measure prepared on a basis consistent with Article 11 of Regulation S-X of the U.S. Securities and Exchange Commission and includes certain non GAAP adjustments. Linde's 2020 adjusted pro forma EBITDA was $8.7 billion.

During calculation of Linde's GHG pathway through 2050 and development of Linde's 2028 targets, we adopted a potential scenario of 17% increase of absolute scope 1 and scope 2 GHG emissions by 2028. This is primarily due to predicted strong business growth in the area of hydrogen (following predictions from Hydrogen Council and others) with new technologies reaching large scale commercialization only after our target horizon (and thus little potential to reduce our scope 1 by 2028). This is in line with projections of the IEA in their latest Sustainable Development Scenario which predicts an increase of chemical sector emissions in the coming years. In any case, the development of absolute emissions in the future will heavily depend on economic/market growth in our industry and other external parameters like new emerging regulations which Linde cannot influence.

In March 2020, Linde officially committed to work towards setting a science-based target for our industry sector, in accordance with the Science-Based Targets initiative.

Linde has defined several operational efficiency targets by business area which will help achieve our overall GHG efficiency target. Those are reported in Linde's 2020 Sustainable Development Report.

Due to a methodology change in steam accounting in 2020, scope 2 as well as GHG vs. EBITDA intensity slightly increased compared to last year's reporting, for the baseline year and target year. The improvement rate (target) itself was not impacted by this change.

C4.2

(C4.2) Did you have any other climate-related targets that were active in the reporting year?

Target(s) to increase low-carbon energy consumption or production
Target(s) to reduce methane emissions
Other climate-related target(s)

C4.2a

(C4.2a) Provide details of your target(s) to increase low-carbon energy consumption or production.

Target reference number
Low 1

Year target was set
2019

Target coverage
Company-wide

Target type: absolute or intensity
Absolute

Target type: energy carrier
Electricity

Target type: activity
Consumption

Target type: energy source
Low-carbon energy source(s)

Metric (target numerator if reporting an intensity target)
MWh

Target denominator (intensity targets only)

Base year
2018

Figure or percentage in base year
15,200,000

Target year
2028

Figure or percentage in target year
30,400,001

Figure or percentage in reporting year
16,420,000

% of target achieved [auto-calculated]

8.0263152614

Target status in reporting year

Underway

Is this target part of an emissions target?

Yes. This target feeds into the overall scope 1 and 2 GHG efficiency target (reduce GHG vs. EBITDA intensity by 35%) described in the intensity target section. This target tackles Linde's scope 2 emissions.

Is this target part of an overarching initiative?

No, it's not part of an overarching initiative

Please explain (including target coverage)

Linde has set a target to more than double its annual consumption of low-carbon electricity, primarily from active renewable energy sourcing. The scope is all Linde operations within our GHG reporting boundary. Low carbon electricity is defined as electricity produced from non-fossil fuel sources (including renewables, such as solar, wind, biomass, geothermal, hydro and other low-carbon, [e.g., nuclear]). The target includes passive electricity (i.e., from the grid) and active sourcing over PPAs, RECs, certificates and sourcing contracts for specific facilities. It considers all energy consumption where Linde purchases the electricity. It excludes electricity where Linde is not the purchaser.

In 2018, the baseline year of the target, Linde sourced 15.2 TWh of low carbon electricity. In 2020, Linde sourced 16.4 TWh low-carbon energy, or 39 percent of all its purchased electricity. Of this, Linde actively sourced 2.9 TWh of renewable energy, an increase of 0.5 TWh compared to 2019. Linde electricity use in the UK is almost 100 percent renewable, using wind. Renewable electricity is also sourced in New York State (U.S.), Colombia, India, Spain, the Philippines and other geographies.

This target is part of Linde's new 2018-2028 sustainable development target to reduce GHG intensity by 35% (using EBITDA as the denominator).

C4.2b

(C4.2b) Provide details of any other climate-related targets, including methane reduction targets.

Target reference number

Oth 1

Year target was set

2019

Target coverage

Company-wide

Target type: absolute or intensity

Absolute

Target type: category & Metric (target numerator if reporting an intensity target)

Other, please specify

Other, please specify

Reduction of other scope 1 GHG emissions incl. methane emissions in million tons CO2e

Target denominator (intensity targets only)

Base year

2018

Figure or percentage in base year

1.68

Target year

2028

Figure or percentage in target year

1.51

Figure or percentage in reporting year

1.52

% of target achieved [auto-calculated]

94.1176470588

Target status in reporting year

Underway

Is this target part of an emissions target?

Yes, it is part of the overall GHG intensity target described as Int 1

Is this target part of an overarching initiative?

No, it's not part of an overarching initiative

Please explain (including target coverage)

This new target relates to a set of "Other" GHG emissions within scope 1 from sources of GHG other than direct CO2 emitted, including methane emissions. Other GHG emissions within this target are from refrigerant losses from cylinder refilling operations; nitrous oxide (N_2O) emissions from N_2O plants and cylinder filling; and methane releases from helium and CO_2 plants, which account for most of Linde's other GHG emissions. The target is to reduce these absolute emissions by 10% by 2028.

In 2020, a reduction of over 9% was achieved compared to baseline year.

Target reference number

Oth 2

Year target was set

2019

Target coverage

Company-wide

Target type: absolute or intensity

Absolute

Target type: category & Metric (target numerator if reporting an intensity target)

R&D investments

Percentage of R&D budget/portfolio dedicated to low-carbon products/services

Target denominator (intensity targets only)

Base year

2018

Figure or percentage in base year

23

Target year

2028

Figure or percentage in target year

33

Figure or percentage in reporting year

26

% of target achieved [auto-calculated]

30

Target status in reporting year

Underway

Is this target part of an emissions target?

No, our overarching emission reduction target does not factor in results from current R&D developments in the low carbon area, as the results and timing when effects from such new technologies will materialize are difficult to predict. Impacts from low-carbon developments/innovation will come on top of the managed targets defined for 2028 but are rather expected to be effective in the mid and long term.

Is this target part of an overarching initiative?

No, it's not part of an overarching initiative

Please explain (including target coverage)

Linde plans to spend more than one third of its annual R&D budget on low carbon technologies, by 2028. The scope includes annual spend to develop lower-carbon technology for Linde assets or to develop lower-carbon solutions for our customers. Linde invested 26 percent of its 2020 R&D budget ($152 million) into decarbonization (2019: 25 percent). Initiatives include developing industry-leading carbon capture technologies, investing in promising green hydrogen technologies, and driving operational efficiency to further reduce GHG intensity.

Target reference number

Oth 3

Year target was set

2019

Target coverage

Company-wide

Target type: absolute or intensity

Absolute

Target type: category & Metric (target numerator if reporting an intensity target)

Other, please specify

Other, please specify

Investment in low carbon projects / initiatives

Target denominator (intensity targets only)

Base year

2018

Figure or percentage in base year

0

Target year

2028

Figure or percentage in target year

1,000,000,000

Figure or percentage in reporting year

128,000,000

% of target achieved [auto-calculated]

12.8

Target status in reporting year

Underway

Is this target part of an emissions target?

This target is not directly part of Linde's emission reduction target (as a sub target of this), however will help to achieve overall GHG efficiency savings due to a higher portion of low-carbon projects in the future (incl. CCUS projects, etc.)

Is this target part of an overarching initiative?

No, it's not part of an overarching initiative

Please explain (including target coverage)

Linde plans to invest more than $1 billion in low-carbon projects impacting Linde's own carbon footprint or that of its customers. The scope is capital projects of more than $2 million, where the primary aim of Linde and/or its customers is to reduce GHG emissions or advance the use of low-carbon fuels and energy. Since 2018, Linde has invested a cumulative $128 million, of which the largest was the stake in the joint venture ITM Linde Electrolysis GmbH.

Target reference number

Oth 4

Year target was set

2019

Target coverage

Company-wide

Target type: absolute or intensity

Absolute

Target type: category & Metric (target numerator if reporting an intensity target)

Other, please specify

Other, please specify

Emissions avoided through the use of Linde products and applications

Target denominator (intensity targets only)

Base year

2020

Figure or percentage in base year

2

Target year

2020

Figure or percentage in target year

2.3

Figure or percentage in reporting year

2.3

% of target achieved [auto-calculated]

100

Target status in reporting year

Achieved

Is this target part of an emissions target?

No

Is this target part of an overarching initiative?

No, it's not part of an overarching initiative

Please explain (including target coverage)

Linde has set a target to enable annually two times the amount of its own scope 1+2 GHG emissions to be avoided by customers or their end users from certain signature products. The target runs from 2018-2028. The target must be achieved each year, therefore each reporting year is a target year as well as the base year.

The figure or percentage above was set to 2 for the base year as this is the required achievement (2 times emissions avoided by our customers). The values for target year = reporting year were set to 2.3. This is the value which was actually achieved in 2020. The target was therefore 100% achieved.

In 2020, our emissions were 37,215,000 MT, meaning our target was to enable at least 74,430,000 MT to be avoided by customers. (37,215,000 MT CO2e * 2 = 74,430,000 MT CO2e). In fact, Linde avoided 85,000,000 MT in 2020 which is 2.3 times the amount of our own scope 1 and 2 emitted.

We calculated the carbon productivity of 5 signature products in 5 markets, including hydrogen sold to make ultra-low sulfur fuel (used in vehicles with diesel particulate filters), oxygen sold to optimize combustion in steelmaking, krypton sold to insulate windows, argon for welding, and specialty coatings to make thermal barriers for industrial gas turbine and jet engine efficiency. These markets contributed around 8% of gases sales in 2020.

In 2020, Linde updated its calculations for emissions avoided, e.g., using the latest emission factors. This, together with a drop in sales, lead to a reduction in the sum of emissions avoided calculated compared to previous years.

Linde does not calculate scope 3 GHG emissions from use of our products. Therefore, we are not able to express this target as a scope 3 reduction target. Instead, we describe it here as "other."

C4.3

(C4.3) Did you have emissions reduction initiatives that were active within the reporting year? Note that this can include those in the planning and/or implementation phases.

Yes

C4.3a

(C4.3a) Identify the total number of initiatives at each stage of development, and for those in the implementation stages, the estimated CO2e savings.

	Number of initiatives	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	0	0
To be implemented*	294	92,000
Implementation commenced*	600	188,400
Implemented*	1,882	575,825
Not to be implemented	0	0

C4.3b

(C4.3b) Provide details on the initiatives implemented in the reporting year in the table below.

Initiative category & Initiative type

Energy efficiency in production processes

Process optimization

Estimated annual CO2e savings (metric tonnes CO2e)

383,110

Scope(s)

Scope 1

Scope 2 (market-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

75,488,000

Investment required (unit currency – as specified in C0.4)

25,000,000

Payback period

1-3 years

Estimated lifetime of the initiative

Ongoing

Comment

797 voluntary projects providing permanent improvements to energy requirements for turbines, compressors, fans, and other primary process equipment, improvement to heat transfer efficiency and control equipment for process efficiency and reliability optimization. The field payback period indicates the average payback period for projects that need some investments. For several projects investments are not required to realize the savings (e.g., improvement of procedures which do not need any changes in equipment).

Initiative category & Initiative type

Transportation

Company fleet vehicle efficiency

Estimated annual CO2e savings (metric tonnes CO2e)

29,943

Scope(s)

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

45,756,000

Investment required (unit currency – as specified in C0.4)

15,000,000

Payback period

1-3 years

Estimated lifetime of the initiative

Ongoing

Comment

895 voluntary projects provided permanent reduction in diesel and gasoline use and corresponding GHG emissions from fuel efficiency or route efficiency programs, onsite tank size optimization, trailer size optimization and track engine modifications to maximize fuel economy. The field payback period indicates the average payback period for projects that need some investments. For several projects investments are not required to realize the savings (e.g., improvement of procedures, such as transport routes, which do not need any changes in equipment).

Initiative category & Initiative type

Fugitive emissions reductions

Other, please specify

different projects reducing transfers, increasing process efficiency, system integrity and refrigerant replacements

Estimated annual CO2e savings (metric tonnes CO2e)

106,281

Scope(s)

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

4,034,000

Investment required (unit currency – as specified in C0.4)

1,500,000

Payback period

1-3 years

Estimated lifetime of the initiative

Ongoing

Comment

77 projects reduced product CO2 and ODS emissions through reducing transfers, process efficiency, system integrity and refrigerant replacements. The field payback period indicates the average payback period for projects that actually need some investments. For several projects investments are not required to realize the savings (e.g., improvement of procedures which do not need any changes in equipment).

Initiative category & Initiative type

Energy efficiency in buildings

Lighting

Estimated annual CO2e savings (metric tonnes CO2e)

6,386

Scope(s)

Scope 2 (market-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

648,000

Investment required (unit currency – as specified in C0.4)

2,000,000

Payback period

1-3 years

Estimated lifetime of the initiative

Ongoing

Comment

41 voluntary projects providing permanent reduction in power consumption for lighting retrofits, HVAC controls and building power improvements.

Initiative category & Initiative type

Company policy or behavioral change
Resource efficiency

Estimated annual CO2e savings (metric tonnes CO2e)

50,105

Scope(s)

Scope 1
Scope 2 (market-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

7,436,000

Investment required (unit currency – as specified in C0.4)

1,200,000

Payback period

4-10 years

Estimated lifetime of the initiative

Ongoing

Comment

72 projects including waste recovery, innovatively revising business, office and supply chain processes to reduce non-product utilities, secure alternative raw material sources for lower internal process energy consumption, lower power use for equipment maintenance, and similar items. The field payback period indicates the average payback period for projects that actually need some investments. For several projects investments are not required to realize the savings (e.g., behavioral changes which do not need new equipments).

C4.3c

(C4.3c) What methods do you use to drive investment in emissions reduction activities?

Method	Comment
Financial optimization calculations	Inputs, especially energy, are a significant portion of Linde's cost stack, therefore savings in energy or other raw or process materials (e.g., water) generally lead to a reduction in Linde's cost = financial optimization. Linde's sustainable productivity organization measures the environmental savings in our productivity work along with the financial benefits such optimization measures bring. As part of Linde's new 2028 sustainable development targets, Linde has defined a target to achieve $ 1.3 billion savings from sustainable productivity initiatives. Linde's sustainable productivity target measures productivity projects that bring financial and environmental savings in all our EKPI areas, including savings in energy and GHG. All of Linde's new SD targets are managed targets, that means they are tracked periodically by management including annual MC and board oversight and are part of financial management incentives. This target therefore additionally drives management engagement in this area. In 2020, energy and GHG efficiency projects resulted in savings of more than $132 million, and 576,000 MT CO2e avoided (counting both implemented projects and projects where implementation has commenced but full benefits will accrue in 2020). These projects contributed to a reduction in electricity use as well as reductions in natural gas and fuel use.

C4.5

(C4.5) Do you classify any of your existing goods and/or services as low-carbon products or do they enable a third party to avoid GHG emissions?

Yes

C4.5a

(C4.5a) Provide details of your products and/or services that you classify as low-carbon products or that enable a third party to avoid GHG emissions.

Level of aggregation

Group of products

Description of product/Group of products

Linde has a target to demonstrate and validate customer carbon productivity for selected products. Linde’s carbon productivity has been calculated for five signature products in five markets:

1) Hydrogen (H2) sold to make ultra-low sulfur diesel fuel (ULSD). When used in trucks fitted with diesel particulate filters, it eliminates black carbon. Environmental agencies, including a joint 2011 UNEP and World Meteorological Association report: “Integrated Assessment of Black Carbon and Tropospheric Ozone,” see the elimination of black carbon as being the crucial short-term strategy to reduce the rate of global warming.
2) Krypton sold to insulate thermal windows.
3) Oxygen (O2) sold to optimize combustion in steel making.
4) Argon for welding.
5) Specialty coatings to make thermal barriers for industrial gas turbine and jet engine efficiency.

These applications allow Linde customers and their end users to avoid Scope 1 and Scope 2 energy-related GHG emissions. In 2020 this led to 85 million MT CO2e avoided which is 2.3 times more than all scope 1 and 2 emitted by Linde's operations.

Are these low-carbon product(s) or do they enable avoided emissions?

Avoided emissions

Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions

Addressing the Avoided Emissions Challenge- Chemicals sector

% revenue from low carbon product(s) in the reporting year

8

Comment

These low carbon applications enabled customers and their end users to avoid 85 million metric tons of their Scope 1+2 CO2e in 2020. This includes 10.5 million MT avoided by the use of oxygen in steel making, 58.5 million MT avoided by the use of hydrogen in ultra-low sulfur diesel, 10.9 million MT avoided from the use of specialty coatings to make thermal barriers for industrial gas turbine and jet engine energy efficiency, and 5,1 million MT avoided from Krypton in windows and Argon in welding. End-user avoided CO2 emissions are calculated in accordance with International Council of Chemical Associations (ICCA) guidelines. Avoided emissions arise from efforts by multiple partners along the respective value chains. Linde’s contribution has been characterized as fundamental in enabling the avoided emissions. See “Addressing the Avoided Emissions Challenge: guidelines from the chemical industry for accounting for and reporting greenhouse gas (GHG) emissions avoided along the value chain based on comparative studies,” ICCA, October 2003. https://www.icca-chem.org/wp-content/uploads/2015/08/Addressing-the-Avoided-Emissions-Challenge.pdf.

In 2020, Linde updated its calculations for emission avoided, e.g., using the latest emission factors. This, together with a drop in sales, lead to a reduction in the sum of emissions avoided calculated compared to previous years.

Level of aggregation

Product

Description of product/Group of products

Hydrogen produced from by-product hydrogen. About 22% of the hydrogen produced by Linde is based on by-product used as a feedstock, which is captured from another industrial process (for which it is a waste product). Instead of burning/disposing, Linde is treating the by-product hydrogen and producing hydrogen that is the same quality as the hydrogen produced from the steam methane reforming process, avoiding about 3 million MT of scope 1 emissions per year compared to using natural gas as feedstock.

Are these low-carbon product(s) or do they enable avoided emissions?

Low-carbon product and avoided emissions

Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions

Other, please specify

By-product from another industrial process used instead of own production (no fuel consumption)

% revenue from low carbon product(s) in the reporting year

1

Comment

Linde has a target to improve its scope 1 product intensity for hydrogen by 4% over 10 years (2018-2028). This includes using a higher portion of low-carbon sources of hydrogen, including by-product hydrogen. From 2018-2020 GHG efficiency in the hyco area improved by 7.1%, mainly due to a higher portion of by-product sourcing.

C5. Emissions methodology

C5.1

(C5.1) Provide your base year and base year emissions (Scopes 1 and 2).

Scope 1

Base year start

January 1, 2018

Base year end

December 31, 2018

Base year emissions (metric tons CO2e)

16,872,000

Comment

Linde has chosen 2018 as the base year for its 10-year managed climate change targets. 2018 marks the year of completion of the merger between Praxair Inc. and Linde AG which was effective October 2018. The base year figure provided here is a pro forma figure for the full year of 2018 for the merged organization (final organizational structure after merger, excluding divestitures). The 2018 pro forma figure has been externally verified. It follows the same reporting standards, methodologies and boundaries as defined for the new Linde organization in 2019.

Scope 2 (location-based)

Base year start

January 1, 2018

Base year end

December 31, 2018

Base year emissions (metric tons CO2e)

0

Comment

Linde has chosen 2018 as the base year for its new 10-year managed climate change targets. 2018 marks the year of completion of the merger between Praxair Inc. and Linde AG which was effective October 2018.

Linde uses a market-based Scope 2 figure for measuring progress against its GHG targets. Therefore, Linde did not calculate a 2018 pro forma value for scope 2 using the location-based approach.

Scope 2 (market-based)

Base year start

January 1, 2018

Base year end

December 31, 2018

Base year emissions (metric tons CO2e)

22,333,000

Comment

Linde has chosen 2018 as the base year for its 10-year managed climate change targets. 2018 marks the year of completion of the merger between Praxair Inc. and Linde AG which was effective October 2018.

The base year figure provided here is a pro forma figure for the full year of 2018 for the merged organization, which has been externally verified.

The number is different from last year’s reported scope 2 base year number, due to a change in methodology for steam accounting. In 2020, Linde updated its methodology for calculating steam consumption. Instead of an equivalent amount of electricity used, the thermal balance is now calculated. This results in more accurate calculations and led to a general increase in steam consumed as well as a corresponding increase in calculated scope 2 emissions from steam.

This new methodology has been applied retrospectively from 2018 onwards. The change led to a higher market-based scope 2 number by 1.24 million tons CO2e for the 2018 baseline year.

C5.2

(C5.2) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate emissions.

ISO 14064-1
The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)
The Greenhouse Gas Protocol: Scope 2 Guidance
US EPA Mandatory Greenhouse Gas Reporting Rule
Other, please specify
California ARB Reg for Rptg of GHG Emiss

C5.2a

(C5.2a) Provide details of the standard, protocol, or methodology you have used to collect activity data and calculate emissions.

Linde's reporting boundaries for eKPIs are consistent with the financial reporting boundaries and financial control definition as laid out in the GHG protocol to the greatest extent possible. Linde reports on all eKPIs for all subsidiaries, joint ventures and other holdings within its organizational boundaries whose revenues and EBIT (Earnings Before Interests and Taxes) are included in Linde's financial results. Linde does not collect eKPI data for minority holdings and other holdings which are not reporting their financials. EKPIs for joint ventures which are not fully consolidated into the Group financials (at-equity Joint Ventures) are collected but are only included in external GHG reporting under scope 3.

Reporting of GHG emissions by major sources in California is required by the California Global Warming Solutions Act of 2006 (AB 32). The U.S. EPA Regulation for the Mandatory Reporting of Greenhouse Gas Emissions (MRR) is a federal rule applicable to electricity generators, industrial facilities, fuel suppliers, and electricity importers. A summary of reported GHG emissions data reported under MRR are made public each year, and the data used by the Cap-and-Trade Program and included in California Greenhouse Gas Inventory. Certain Linde sites in California are required to report under this regulation. For these sites, we abide by the reporting requirements of this rule to ensure consistency when reporting this data to all stakeholders.

Methodology for reporting scope 2 emissions: Beginning with 2018 pro forma and going forward, Linde reports on all electricity and its resulting scope 2 emissions purchased by the company. Electricity for sites where Linde does not pay the utility bill is excluded from its reported electricity number as well as from the reported scope 2; however, it is tracked internally for operational purposes and for scope 3 reporting. The main methodology for calculating scope 2 emissions from electricity is the market-based approach, using site-specific emissions factors by plant according to supplier contracts and utility bills where available. For sites where such market-based factors are not available, Linde uses the most recent location-based factors from the IEA and EPA's eGRID factors for the U.S. A location-based scope 2 number is calculated and reported for supplementary information.

C6. Emissions data

C6.1

(C6.1) What were your organization's gross global Scope 1 emissions in metric tons CO2e?

Reporting year

Gross global Scope 1 emissions (metric tons CO2e)

16,247,000

Start date

January 1, 2020

End date

December 31, 2020

Comment

In 2020, absolute scope 1 emissions dropped by 0.2 million tons CO2e.

The primary source of scope 1 emissions for Linde is the combustion of natural gas at hydrogen plants, which represented 10.6 million tons of scope 1 emissions in 2020, a drop by 0.5 million tons compared to 2019, mainly due to a general slow-down of hyco business related to Covid-crisis.

Another portion is from ASU plants using natural gas for energy generation, which amounted to 2.1 million tons CO2e (no change to 2019). Smaller sources of scope 1 emissions are other greenhouse gases, e.g., from methane plants or nitrous oxide plants or other types of GHG emissions which are converted into CO2 equivalents. The total of such "other GHG emissions" was 1.52 million tons in 2020, a decrease of 0.2 million tons from 2019. CO2 and other plants caused about 1.4 million tons, an increase of 0.4 million tons compared to 2019, among others due to higher emission reported by plants which haven't been included in the reporting boundaries before. The combustion of diesel and gasoline from transport activities resulted in about 0.6 million tons CO2e in 2020 (a slight decrease by 0.1 million tons).

Past year 1

Gross global Scope 1 emissions (metric tons CO2e)

16,461,000

Start date

January 1, 2019

End date

December 31, 2019

Comment

No change in numbers compared to what was reported in last year's CDP

Past year 2

Gross global Scope 1 emissions (metric tons CO2e)

16,872,000

Start date

January 1, 2018

End date

December 31, 2018

Comment

No change in numbers compared to what was reported in last year's CDP

C6.2

(C6.2) Describe your organization’s approach to reporting Scope 2 emissions.

Row 1

Scope 2, location-based

We are reporting a Scope 2, location-based figure

Scope 2, market-based

We are reporting a Scope 2, market-based figure

Comment

Linde’s reporting boundaries for eKPIs are consistent with the financial reporting boundaries and financial control definition to the greatest extent possible. Linde reports on all eKPIs for all subsidiaries, joint ventures and other holdings within its organizational boundaries whose revenues and EBIT (Earnings Before Interests and Taxes) are included in Linde’s financial results. Linde does not collect eKPI data for minority holdings and other holdings which are not reporting their financials. EKPIs for joint ventures which are not fully consolidated into the Group financials (at-equity Joint Ventures) are collected but are only included in external GHG reporting under scope 3.

Methodology for reporting scope 2 emissions: Linde reports on all electricity and its resulting scope 2 emissions purchased by the company. Electricity for sites where Linde does not pay the utility bill is excluded from its reported electricity number as well as from the reported scope 2; however, it is tracked internally for operational purposes and for scope 3 reporting. The main methodology for calculating scope 2 emissions from electricity is the market-based approach, using site-specific emissions factors by plant according to supplier contracts and utility bills where available. For sites where such market-based factors are not known, Linde uses the most recent location-based factors from the IEA and EPA’s eGRID factors for the U.S.

Linde also calculates Scope 2 emissions using the location-based approach, which applies IEA factors and eGRID emission factors in the U.S. The difference between market-based and location-based emissions are mostly due to certain plants where customers provide the electricity to Linde (which Linde purchases). Some of these plants have a very high market-based emission factor compared to the location-based emission factor, thus market-based scope 2 is higher than location-based.

C6.3

(C6.3) What were your organization's gross global Scope 2 emissions in metric tons CO2e?

Reporting year

Scope 2, location-based

20,063,000

Scope 2, market-based (if applicable)

20,969,000

Start date

January 1, 2020

End date

December 31, 2020

Comment

The methodology change regarding steam consumption and scope 2 from steam lead to an increase in scope 2 (for both market and location based) in the reporting year by 1.3 million tons CO2e. The methodology was applied retrospectively from 2018.
On a new comparable basis, Linde's market-based scope 2 emissions dropped by 1.3 million tons CO2e in 2020 compared to 2019, or by 6%. This is mainly due to a higher amount of low carbon electricity procured in 2020 and a positive development in grid emission factors for the countries in which Linde operates.

Past year 1

Scope 2, location-based

21,101,000

Scope 2, market-based (if applicable)

22,250,000

Start date

January 1, 2019

End date

December 31, 2019

Comment

In 2020, Linde updated its methodology for calculating steam consumption. Instead of an equivalent amount of electricity used, the thermal balance is now calculated. This results in more accurate calculations and led to a general increase in steam consumed as well as a corresponding increase in calculated scope 2 emissions from steam. This new methodology has been applied retrospectively from 2018 onwards. The change lead to a higher market-based and location based scope 2 number by 1.1 million tons CO2e for 2019.

Past year 2

Scope 2, location-based
0

Scope 2, market-based (if applicable)
22,333,000

Start date
January 1, 2018

End date
December 31, 2018

Comment
In 2020, Linde updated its methodology for calculating steam consumption. Instead of an equivalent amount of electricity used, the thermal balance is now calculated. This results in more accurate calculations and led to a general increase in steam consumed as well as a corresponding increase in calculated scope 2 emissions from steam. This new methodology has been applied retrospectively from 2018 onwards. The change lead to a higher market-based scope 2 number by 1.24 million tons CO2e for 2018. Linde did not calculate a pro-forma value for location based scope 2 for 2018.

C6.4

(C6.4) Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure?

Yes

C6.4a

(C6.4a) Provide details of the sources of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure.

Source
Linde has defined de-minimis criteria for the reporting of climate related KPIs from its over 1000 locations worldwide. For example, Linde has small sales offices or workshops which consume small amounts of electricity which are not relevant to Linde's overall

footprint. Furthermore, Linde considers emissions from facility start-ups only in the 3rd month after start of operation, when processes have stabilized and the plant has ramped up and is close to reaching targeted loads.

Relevance of Scope 1 emissions from this source

Emissions are not relevant

Relevance of location-based Scope 2 emissions from this source

Emissions are not relevant

Relevance of market-based Scope 2 emissions from this source (if applicable)

Emissions are not relevant

Explain why this source is excluded

Due to the work-effort of reporting each single small office location into Linde's reporting system compared to the significance of the numbers reported, Linde has decided not to collect reporting information from sites which are below the de-minimis criteria, as well as from sites which are still in a ramp up stage. Emissions from those offices/sites excluded represent less than 1% of Linde's total reported emissions and are therefore considered not relevant.

C6.5

(C6.5) Account for your organization’s gross global Scope 3 emissions, disclosing and explaining any exclusions.

Purchased goods and services

Evaluation status

Relevant, calculated

Metric tonnes CO2e

1,640,000

Emissions calculation methodology

After electricity and energy (reported as fuel-and energy related scope 3), the most important input/raw material used by Linde is natural gas. This represents >80% of scope 3 emissions from purchased goods and services (the rest is distributed over numerous small items and values). Linde’s scope 3 number is therefore based on this input material only as this represents the majority source of emissions from this category. To calculate scope 3 emissions from natural gas purchased and used as feedstock Linde applies the same methodology and calculations as for natural gas purchased as fuel/energy, which is based on the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard, Category 3 for scope 3 emissions caused in the extraction, production, and transportation of fuels and energy.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Please explain

Linde's scope 3 number for materials purchased is currently based on scope 3 from natural gas only, as this input material represents the majority source of emissions from this category. To calculate scope 3 emissions from natural gas purchased and used as feedstock Linde applies the same methodology and calculations as for natural gas purchased as fuel/energy, which is based on the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard, Category 3 for scope 3 emissions caused in the extraction, production, and transportation of fuels and energy. Input from suppliers/value chain partners to this calculation are not required.

Linde is currently reviewing its approach how to calculate scope 3 emissions from suppliers (raw materials purchased and capital goods), and is planning to define a new, more detailed methodology how to calculate those scope 3 emissions for the next reporting cycle. Linde thereby evaluates the option to include data from selected relevant suppliers or commodities.

Capital goods

Evaluation status

Relevant, calculated

Metric tonnes CO2e

931,000

Emissions calculation methodology

Linde comprises of a large engineering business. The principal material Linde procured for capital projects is metal products, mainly steel, followed by electrical equipment and other non-ferrous materials. Linde uses industry emission factors for emissions / spend to calculate its scope 3 emissions for the most important materials by value covering. Linde used standard factors from DEFRA to calculate the amount of CO2 generated by main material group (by weight) purchased by the company. The last calculation of this type of scope 3 emissions used for 2018 reporting was based on full-year data accumulated from legacy companies. Since annual revenue and the size of the Linde business was similar in 2019 when compared to 2018, the same full-year value for 2018 was carried forward. In 2020, due to limited resources resulting from the COVID-19 pandemic, these emissions were estimated by pro-rating revenue.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Please explain

Linde is currently reviewing its approach how to calculate scope 3 emissions from suppliers (raw materials purchased and capital goods), and is planning to define a new, more detailed methodology how to calculate those scope 3 emissions for the next reporting cycle. Linde thereby evaluates the option to include data from selected relevant suppliers or commodities.

Fuel-and-energy-related activities (not included in Scope 1 or 2)

Evaluation status

Relevant, calculated

Metric tonnes CO2e

5,290,000

Emissions calculation methodology

Scope 3 emissions from fuel-and energy-related activities (including upstream emissions from purchased fuel, purchased electricity and transmission and distribution losses) are the most significant source of scope 3 emissions for Linde, as Linde's business is energy-intensive, and energy is a significant cost for Linde. The methodology used is based on the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard, Category 3 for scope 3 emissions caused in the extraction, production, and transportation of fuels and energy purchased by Linde. For electricity, Linde applies IEA factors for T&D losses and DEFRA factors for Well-to-Tank (WTT) to calculate all the scope 3 GHG emissions released into the atmosphere from the production, processing and delivery of energy. The calculation is done on a site level for each site for which Linde purchases the power. For thermal energy, a global WTT factor for heat and steam from DEFRA is applied. For scope 3 emissions from transport fuels as well as other fuels consumed (excl. feedstocks) DEFRA factors for fuel- and energy-related emissions are used per relevant category.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

Please explain

Linde uses information from suppliers provided on the utility bills to calculate fuel-related scope 3 emissions. Linde's methodology is based on the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard, Category 3 for scope 3 emissions caused in the extraction, production, and transportation of fuels and energy purchased by Linde. Linde uses standard factors from IEA or DEFRA and applies this to the electricity / energy reported by its sites. For this approach information/data from suppliers is not necessary.

Upstream transportation and distribution

Evaluation status

Not relevant, explanation provided

Please explain

99 percent by weight of the raw materials used in 2019 to produce Linde's main products (gaseous nitrogen, oxygen, argon, carbon dioxide and hydrogen) were renewable raw materials: air, water, carbon dioxide and (by product) hydrogen. Those products, especially air, do not need any transportation, but are directly used at the location where the end products are generated (e.g., by-product hydrogen directly captured from industrial process on site and processed there). Same for water or carbon dioxide withdrawn from other industrial processes or a direct CO2 source. Linde also has an engineering business which requires components, e.g., from metal, to be

transported to the construction site. Considering those transports, Linde estimates that the total of its upstream transportation and distribution emissions are less than 2% of its total scope 3 emissions and therefore not considered relevant.

Waste generated in operations

Evaluation status

Not relevant, explanation provided

Please explain

Linde has reported scope 3 from waste generated in operations in the past. As this category only represents about 0.2% of Linde's total scope 3 emissions, Linde considers these emissions not relevant.

Business travel

Evaluation status

Relevant, calculated

Metric tonnes CO2e

21,000

Emissions calculation methodology

The calculation is based on air miles travelled by country of destination. Calculation uses CO2 factors provided by the respective airline.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

Please explain

Calculation uses CO2 factors provided by the respective airline.

Employee commuting

Evaluation status

Not relevant, explanation provided

Please explain

Linde estimates that employee commuting contributes less than 2% of its total scope 3 emissions. This type of emissions are small compared to other scope 3 sources. Excluding employee commuting does not compromise the relevance of Linde's reported inventory, as the vast majority of Linde's carbon footprint comes from natural gas and electricity consumption. Furthermore, data collection and analysis for more than 74,000 employees worldwide is complex. Moreover, in 2020 due to Covid-19 wherever possible work was executed from home, which lead to a further strong decrease of employee commuting and related GHG emissions.

Upstream leased assets

Evaluation status

Not relevant, explanation provided

Please explain

Linde does not lease upstream assets, except in a few cases where small office spaces are rented. Linde estimates that scope 3 from leased assets represents less than 1% of its total scope 3 emissions and therefore does not consider these emissions relevant.

Downstream transportation and distribution

Evaluation status

Relevant, calculated

Metric tonnes CO2e

562,000

Emissions calculation methodology

Scope 3 emissions from downstream transportation and distribution are now Linde's fifth largest scope 3 source. Contractor miles driven are collected in each country and business or region and tracked. Linde's Scope 3 emissions resulting from delivery of products by third-party carriers were derived using the same methodology to calculate GHG emissions from owned trucks: Emissions from transport are calculated based on actual km driven for commercial and non-commercial vehicles, multiplied by average emission factors by vehicle type from the "Estimated U.S. Average Vehicle Emissions Rates per Vehicle by Vehicle Type using Gasoline and Diesel (Grams per mile)" from the U.S. Environmental Protection Agency, Office of Transportation and Air Quality, personal communication, Apr. 6, 2018.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

Please explain

Data on km travelled are obtained from contractors per transport vehicle.

Processing of sold products

Evaluation status

Not relevant, explanation provided

Please explain

Guidance for this category is based on the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard, section 6.4. Linde is at the beginning of many value chains (for carbonated beverage companies, refineries, electronics, aerospace, automotive, healthcare, steel making, etc.). Linde provides many intermediate products with many downstream applications, each of which has a very different GHG profile. The effort involved in determining Scope 3 emissions from processing of our products is not reasonable, and for this reason, we are unable to reasonably estimate the downstream emissions associated with the various end uses of our products. For these reasons, we do not report emissions in the following categories:

processing of sold products, use of sold products, and end of life treatment of sold products.

Use of sold products

Evaluation status

Not relevant, explanation provided

Please explain

Guidance for this category is based on the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard, section 6.4. Linde is at the beginning of many value chains (for carbonated beverage companies, refineries, electronics, aerospace, automotive, healthcare, steel making, etc.). Linde provides many intermediate products with many downstream applications, each of which has a very different GHG profile. The effort involved in determining Scope 3 emissions from processing of our products is not reasonable, and for this reason, we are unable to reasonably estimate the downstream emissions associated with the various end uses of our products. For these reasons, we do not report emissions in the following categories: processing of sold products, use of sold products, and end of life treatment of sold products.

End of life treatment of sold products

Evaluation status

Not relevant, explanation provided

Please explain

Guidance for this category is based on the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard, section 6.4. Linde is at the beginning of many value chains (for carbonated beverage companies, refineries, electronics, aerospace, automotive, healthcare, steel making, etc.). Linde provides many intermediate products with many downstream applications, each of which has a very different GHG profile. The effort involved in determining Scope 3 emissions from processing of our products is not reasonable, and for this reason, we are unable to reasonably estimate the downstream emissions associated with the various end uses of our products. For these reasons, we do not report emissions in the following categories: processing of sold products, use of sold products, and end of life treatment of sold products.

Downstream leased assets

Evaluation status

Relevant, calculated

Metric tonnes CO2e

2,050,000

Emissions calculation methodology

This category includes emissions for assets like smaller on-site facilities which are leased out to the customer and where the customer is paying for the power and in many cases is operating the plant. This also includes a couple of major plants where customers are paying the power and where Linde is operating the plant and charging a facility fee to the customer. Emissions for those plants where the customer pays for power are not included in Linde's scope 2. Linde has a significant number of smaller on-site plants leased out to and operated by the customer all over the world. Hyco plants/facilities which are owned by Linde are fully reported under scope 1, regardless of who is running the plant or providing the fuel or feedstock. Emissions from leased out or charged out entities are calculated on a plant level, using same calculation methodology as for calculating indirect/scope 2 emissions for other Linde plants. For such plants where the customer pays the power and the plant specific emission factors are not known, Linde uses country emission factors from the IEA to calculate indirect emissions for those sites. Linde also uses information from its own data collection processes (for larger plants which Linde also maintains) or uses estimates on production volumes per type of plant and energy consumption (for small on-site plants). Linde then applies country emission factors from the IEA to calculate indirect emissions for those sites.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

55

Please explain

Emissions from leased out or charged out entities are calculated on a plant level, using same calculation methodology as for calculating indirect/scope 2 emissions for other Linde plants. For such plants where the customer pays the power and the plant specific emission factors are not known, Linde uses country emission factors from the IEA to calculate indirect emissions for those sites. Linde also uses information from its own data collection processes (for larger plants which Linde also maintains) or uses estimates on production volumes per type of plant and energy consumption (for small on-site plants).

Franchises

Evaluation status

Not relevant, explanation provided

Please explain

Linde does not own franchises.

Investments

Evaluation status

Relevant, calculated

Metric tonnes CO2e

3,930,000

Emissions calculation methodology

Linde includes into its scope 1 and 2 reporting only subsidiaries/holdings which are reporting their financials to the Group and whose results are consolidated into the company P&L. Holdings/investments which are reporting their results but are not consolidated into the profit and loss statement (mainly Joint Ventures consolidated at-equity) are not considered for scope 1 and 2 emissions, but are reported as scope 3 from investments. Linde has large JV operations, especially in China. Linde calculates its emissions due to investments on a plant level. All JVs are reporting their electricity and other fuel consumption into Linde's environmental reporting system. Linde then calculates scope 3 from such investments for all plants in this category, by adding reported direct emissions from Hyco plants and indirect emissions from ASUs and other plants, based on reported electricity consumption, multiplied with a country IEA factor. In 2020, Linde has changed its methodology how to calculate steam consumption. This affected plants fully owned by Linde and therefore scope 2, but also impacted emissions calculated for JVs and led to higher scope 3 from investments compared to the prior year.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

Please explain

For this category Linde uses reported information from its JV plants (= Linde value chain partner).

Other (upstream)

Evaluation status

Please explain

Other (downstream)

Evaluation status

Please explain

C6.7

(C6.7) Are carbon dioxide emissions from biogenic carbon relevant to your organization?

No

C6.10

(C6.10) Describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tons CO2e per unit currency total revenue and provide any additional intensity metrics that are appropriate to your business operations.

Intensity figure
0.00137

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)
37,216,000

Metric denominator
unit total revenue

Metric denominator: Unit total
27,243,000,000

Scope 2 figure used
Market-based

% change from previous year
0.4

Direction of change
Decreased

Reason for change
Total sales revenues dropped from 2019 to 2020 by 3.5% whereas absolute scope 1 and 2 emissions dropped by 1.5 million tons (= a 4% reduction).
This is due to investments in additional low carbon sources of energy as well as various productivity and efficiency measures conducted during the year. These initiatives are described in C4.3b.

Intensity figure
0.0043

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)
37,216,000

Metric denominator
Other, please specify
EBITDA

Metric denominator: Unit total
8,645,000,000

Scope 2 figure used
Market-based

% change from previous year

9

Direction of change

Decreased

Reason for change

The improvement is due to two factors: EBITDA improved by 6% from 2019 to 2020 and absolute scope 1 and 2 emissions decreased by 1.5 million tons (4% reduction).
This is due to investments in additional low carbon sources of energy as well as various productivity and efficiency measures conducted during the year, as well as a decrease in output. These initiatives are described in C4.3b. The EBITDA number used for this intensity metric is one of the non-GAAP measures reported by Linde plc. It reflects the size of the business for which the emissions are being reported and the efficiency improvements that are being targeted. Adjusted pro forma EBITDA is a non-GAAP measure prepared on a basis consistent with Article 11 of Regulation S-X of the U.S. Securities and Exchange Commission and include certain non GAAP adjustments.

C7. Emissions breakdowns

C7.1

(C7.1) Does your organization break down its Scope 1 emissions by greenhouse gas type?

Yes

C7.1a

(C7.1a) Break down your total gross global Scope 1 emissions by greenhouse gas type and provide the source of each used greenhouse warming potential (GWP).

Greenhouse gas	Scope 1 emissions (metric tons of CO2e)	GWP Reference
CO2	14,725,000	IPCC Fourth Assessment Report (AR4 - 100 year)
Other, please specify Other Greenhouse gases emitted directly such as N2O, CH4, HFCs, etc.	1,522,000	IPCC Fourth Assessment Report (AR4 - 100 year)

C7.2

(C7.2) Break down your total gross global Scope 1 emissions by country/region.

Country/Region	Scope 1 emissions (metric tons CO2e)
Americas	10,816,000
Europe, Middle East and Africa (EMEA)	2,959,000

Asia, Australasia	2,270,000
Other, please specify Engineering, Global operations and other scope 1 emissions not reported by region [1]	202,000

[1]This has significantly reduced from 2019 as more emissions are now reported by region rather than as a global total

C7.3

(C7.3) Indicate which gross global Scope 1 emissions breakdowns you are able to provide.

By business division

C7.3a

(C7.3a) Break down your total gross global Scope 1 emissions by business division.

Business division	Scope 1 emissions (metric ton CO2e)
Air Separation Units (ASUs)	2,087,000
Hydrogen Production	10,636,000
CO2 Plants	980,000
Trucking	632,000
Speciality Gases operations	1,424,000
Other Global operations	488,000

C-CE7.4/C-CH7.4/C-CO7.4/C-EU7.4/C-MM7.4/C-OG7.4/C-ST7.4/C-TO7.4/C-TS7.4

(C-CE7.4/C-CH7.4/C-CO7.4/C-EU7.4/C-MM7.4/C-OG7.4/C-ST7.4/C-TO7.4/C-TS7.4) Break down your organization's total gross global Scope 1 emissions by sector production activity in metric tons CO2e.

	Gross Scope 1 emissions, metric tons CO2e	Comment
Chemicals production activities	15,608,000	This is gases operations excluding engineering, global functions and trucking

C7.5

(C7.5) Break down your total gross global Scope 2 emissions by country/region.

Country/Region	Scope 2, location-	Scope 2, market-based	Purchased and consumed electricity, heat,	Purchased and consumed low-carbon electricity, heat, steam

	based (metric tons CO2e)	(metric tons CO2e)	steam or cooling (MWh)	or cooling accounted for in Scope 2 market-based approach (MWh)
Americas	5,460,000	5,180,000	16,402,000	825,000
Europe, Middle East and Africa (EMEA)	4,277,000	5,094,000	12,440,000	1,740,000
Asia, Australasia [1]	10,154,000	10,554,000	18,624,000	178,000
Other, please specify Other global operations	172,000	141,000	513,000	124,000

[1] Calculation for steam and associated scope 2 emissions improved for APAC region in 2020

C7.6

(C7.6) Indicate which gross global Scope 2 emissions breakdowns you are able to provide.

By business division

C7.6a

(C7.6a) Break down your total gross global Scope 2 emissions by business division.

Business division	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
Air Separation Units (ASUs)	18,072,000	19,452,000
Hydrogen Production	916,000	901,000
All other operations	1,074,000	616,000

C-CE7.7/C-CH7.7/C-CO7.7/C-MM7.7/C-OG7.7/C-ST7.7/C-TO7.7/C-TS7.7

(C-CE7.7/C-CH7.7/C-CO7.7/C-MM7.7/C-OG7.7/C-ST7.7/C-TO7.7/C-TS7.7) Break down your organization’s total gross global Scope 2 emissions by sector production activity in metric tons CO2e.

	Scope 2, location-based, metric tons CO2e	Scope 2, market-based (if applicable), metric tons CO2e	Comment

Chemicals production activities	19,891,000	20,827,000	Scope 2 emissions for all gases operations excluding engineering and other global functions

C-CH7.8

(C-CH7.8) Disclose the percentage of your organization's Scope 3, Category 1 emissions by purchased chemical feedstock.

Purchased feedstock	Percentage of Scope 3, Category 1 tCO2e from purchased feedstock	Explain calculation methodology
Natural gas	100	After electricity and energy use (reported as fuel-and energy related scope 3), the most important input/raw material into production used by Linde is natural gas. As this input material represents the vast majority of Linde's raw materials purchased and main gases feedstock next to air, Linde's scope 3 number from purchased goods and services/purchased feedstock is therefore based on this input material only (therefore reported here as 100% of reported scope 3 from purchased goods and services). To calculate scope 3 emissions from natural gas purchased and used as feedstock Linde applies the methodology and calculations as for natural gas purchased as fuel/energy, which is based on the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard, Category 3 for scope 3 emissions caused in the extraction, production, and transportation of fuels and energy.

C-CH7.8a

(C-CH7.8a) Disclose sales of products that are greenhouse gases.

	Sales, metric tons	Comment
Carbon dioxide (CO2)	0	Linde does not disclose this information because we consider it business confidential.
Methane (CH4)	0	Linde does not disclose this information because we consider it business confidential.
Nitrous oxide (N2O)	0	Linde does not disclose this information because we consider it business confidential.
Hydrofluorocarbons (HFC)	0	Linde does not disclose this information because we consider it business confidential.
Perfluorocarbons (PFC)	0	Linde does not disclose this information because we consider it business confidential.

Sulphur hexafluoride (SF6)	0	Linde does not disclose this information because we consider it business confidential.
Nitrogen trifluoride (NF3)	0	Linde does not disclose this information because we consider it business confidential.

C7.9

(C7.9) How do your gross global emissions (Scope 1 and 2 combined) for the reporting year compare to those of the previous reporting year?

Decreased

C7.9a

(C7.9a) Identify the reasons for any change in your gross global emissions (Scope 1 and 2 combined), and for each of them specify how your emissions compare to the previous year.

	Change in emissions (metric tons CO2e)	Direction of change	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption	436,800	Decreased	1.1	The percentage is calculated by 436,800 (scope 2 savings from increased low carbon sourcing), divided by 38,710,852 (scope 1 and 2 combined number for 2019). 436,800/38,710,852*100=1.1%. Low carbon (zero fossil) electricity sourced has increased in 2020 from 15.51 TWH to 16.42 TWH, an addition of 0.91 TWH, resulting from higher direct sourcing of low carbon electricity as well as general greening of the grid. The low carbon electricity is replacing conventional electricity sourced in several parts of the world. Linde's average emissions factor of energy sourced in 2019 was 0.48 tons of CO2 per 1 MWh. A reduction of 910,000 MWh of conventional electricity (being replaced by zero carbon electricity) therefore means a saving of 436,800 tons of scope 2 emissions.
Other emissions reduction activities	575,000	Decreased	1.5	The percentage is calculated by 575,825 divided by 38,710,852 (scope 1 and 2 combined number for 2019). 575,825/38,710,852*100=1.5%. This refers

				to several activities counted within our sustainable productivity project portfolio which lead to CO2 savings along with financial savings for the Group, e.g., due to energy savings. This includes for example scope 2 savings due to optimization of production processes and therefore reduced energy consumption, as well as building optimization, reduction in spills or transport efficiencies. Details of all emission reduction activities leading to those savings are disclosed in this questionnaire under question 4.3 b.
Divestment				
Acquisitions				
Mergers				
Change in output	580,000	Decreased	1.5	The percentage is calculated by dividing 580,000 by 38,710,852 (scope 1 and 2 combined number for 2019). 580,000/38,710,852*100=1.5%. The change is due to a volume decrease in Linde's hyco business, especially in the US, as a result of slow down of economy in 2020 due to Covid.
Change in methodology				
Change in boundary	740,000	Increased	1.9	The percentage is calculated by dividing 740,000 by 38,710,852 (scope 1 and 2 combined number for 2019). 740,000/38,710,852*100=1.9%. The increase is due to new plants going onstream in USA and Korea leading to higher natural gas and steam consumption. In addition, some plants reported for the first time CO2 losses from dry ice production and cylinder filling leading to higher scope 1 emissions.
Change in physical operating conditions				
Unidentified				
Other	643,100	Decreased	1.7	The percentage is calculated by dividing 643,000 by 38,710,852 (scope 1 and 2

				combined number for 2019). 643,000/38,710,852*100=1.7%. In 2020 Linde negotiated energy contracts with a more favorable energy mix and better emission factors for the electricity purchased for some ASU operations. The improvement in market-based emission factors overall led to a total reduction in scope 2 by 643,000 tons.

C7.9b

(C7.9b) Are your emissions performance calculations in C7.9 and C7.9a based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?

Market-based

C8. Energy

C8.1

(C8.1) What percentage of your total operational spend in the reporting year was on energy?

More than 25% but less than or equal to 30%

C8.2

(C8.2) Select which energy-related activities your organization has undertaken.

	Indicate whether your organization undertook this energy-related activity in the reporting year
Consumption of fuel (excluding feedstocks)	Yes
Consumption of purchased or acquired electricity	Yes
Consumption of purchased or acquired heat	No
Consumption of purchased or acquired steam	Yes
Consumption of purchased or acquired cooling	No
Generation of electricity, heat, steam, or cooling	No

C8.2a

(C8.2a) Report your organization’s energy consumption totals (excluding feedstocks) in MWh.

	Heating value	MWh from renewable sources	MWh from non-renewable sources	Total (renewable and non-renewable) MWh
Consumption of fuel (excluding feedstock)	LHV (lower heating value)	747	21,297,626	21,298,373
Consumption of purchased or acquired electricity		11,669,523	29,952,276	41,621,799
Consumption of purchased or acquired steam		0	6,357,263	6,357,263
Total energy consumption		11,670,270	57,607,165	69,277,435

C-CH8.2a

(C-CH8.2a) Report your organization’s energy consumption totals (excluding feedstocks) for chemical production activities in MWh.

	Heating value	Total MWh
Consumption of fuel (excluding feedstock)	LHV (lower heating value)	18,709,942
Consumption of purchased or acquired electricity		41,116,166
Consumption of purchased or acquired steam		6,346,296
Total energy consumption		66,172,404

C8.2b

(C8.2b) Select the applications of your organization’s consumption of fuel.

	Indicate whether your organization undertakes this fuel application
Consumption of fuel for the generation of electricity	No
Consumption of fuel for the generation of heat	Yes
Consumption of fuel for the generation of steam	Yes
Consumption of fuel for the generation of cooling	No

Consumption of fuel for co-generation or tri-generation	Yes

C8.2c

(C8.2c) State how much fuel in MWh your organization has consumed (excluding feedstocks) by fuel type.

Fuels (excluding feedstocks)
Natural Gas

Heating value
LHV (lower heating value)

Total fuel MWh consumed by the organization
17,759,755

MWh fuel consumed for self-generation of heat
7,232,697

MWh fuel consumed for self-generation of steam
935,017

MWh fuel consumed for self-cogeneration or self-trigeneration
9,592,041

Emission factor
0.20437

Unit
kg CO2e per KWh

Emissions factor source
Where possible local supplier factors based on Natural Gas composition are used, if not available DEFRA average factors are used.

Comment

Fuels (excluding feedstocks)
Diesel

Heating value
LHV (lower heating value)

Total fuel MWh consumed by the organization
2,378,812

MWh fuel consumed for self-generation of heat

2,378,812

MWh fuel consumed for self-generation of steam

0

MWh fuel consumed for self-cogeneration or self-trigeneration

0

Emission factor

2.687

Unit

kg CO2e per liter

Emissions factor source

US EPA

Comment

Fuels (excluding feedstocks)

Other, please specify

Range of fuels and customer waste gases

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

1,159,806

MWh fuel consumed for self-generation of heat

1,159,806

MWh fuel consumed for self-generation of steam

0

MWh fuel consumed for self-cogeneration or self-trigeneration

0

Emission factor

0.3

Unit

kg CO2e per KWh

Emissions factor source

Range of sources including supplier, Defra and EPA

Comment

C8.2e

(C8.2e) Provide details on the electricity, heat, steam, and/or cooling amounts that were accounted for at a zero emission factor in the market-based Scope 2 figure reported in C6.3.

Sourcing method

Power purchase agreement (PPA) with on-site/off-site generator owned by a third party with no grid transfers (direct line)

Low-carbon technology type

Hydropower

Country/area of consumption of low-carbon electricity, heat, steam or cooling

Mexico

MWh consumed accounted for at a zero emission factor

83,765

Comment

Sourcing method

Power purchase agreement (PPA) with a grid-connected generator without energy attribute certificates

Low-carbon technology type

Hydropower

Country/area of consumption of low-carbon electricity, heat, steam or cooling

United States of America

MWh consumed accounted for at a zero emission factor

312,443

Comment

Sourcing method

Power purchase agreement (PPA) with a grid-connected generator without energy attribute certificates

Low-carbon technology type

Nuclear

Country/area of consumption of low-carbon electricity, heat, steam or cooling

United States of America

MWh consumed accounted for at a zero emission factor

317,459

Comment

Sourcing method

Power purchase agreement (PPA) with a grid-connected generator without energy attribute certificates

Low-carbon technology type

Hydropower

Country/area of consumption of low-carbon electricity, heat, steam or cooling

Philippines

MWh consumed accounted for at a zero emission factor

92,257

Comment

Sourcing method

Power purchase agreement (PPA) with a grid-connected generator without energy attribute certificates

Low-carbon technology type

Low-carbon energy mix

Country/area of consumption of low-carbon electricity, heat, steam or cooling

India

MWh consumed accounted for at a zero emission factor

85,510

Comment

Wind and Solar PPA sources

Sourcing method

Unbundled energy attribute certificates, other - please specify

Combination of Guarantees of origin and zero-CO2 certificates

Low-carbon technology type

Nuclear

Country/area of consumption of low-carbon electricity, heat, steam or cooling

Netherlands

MWh consumed accounted for at a zero emission factor

40,145

Comment

Sourcing method

Unbundled energy attribute certificates, other - please specify

Combination of Guarantees of origin and zero-CO2 certificates

Low-carbon technology type

Low-carbon energy mix

Country/area of consumption of low-carbon electricity, heat, steam or cooling

Netherlands

MWh consumed accounted for at a zero emission factor

20,141

Comment

Sourcing method

Green electricity products (e.g. green tariffs) from an energy supplier, supported by energy attribute certificates

Low-carbon technology type

Low-carbon energy mix

Country/area of consumption of low-carbon electricity, heat, steam or cooling

Spain

MWh consumed accounted for at a zero emission factor

77,360

Comment

70% wind 14% HyDro 7% Solar 9% Biomass

Sourcing method

Green electricity products (e.g. green tariffs) from an energy supplier, supported by energy attribute certificates

Low-carbon technology type
Wind

Country/area of consumption of low-carbon electricity, heat, steam or cooling
United Kingdom of Great Britain and Northern Ireland

MWh consumed accounted for at a zero emission factor
1,579,874

Comment

Sourcing method
Green electricity products (e.g. green tariffs) from an energy supplier, supported by energy attribute certificates

Low-carbon technology type
Wind

Country/area of consumption of low-carbon electricity, heat, steam or cooling
Ireland

MWh consumed accounted for at a zero emission factor
27,601

Comment

C-CH8.3

(C-CH8.3) Does your organization consume fuels as feedstocks for chemical production activities?
Yes

C-CH8.3a

(C-CH8.3a) Disclose details on your organization's consumption of fuels as feedstocks for chemical production activities.

Fuels used as feedstocks
Natural gas

Total consumption
176,560

Total consumption unit
million cubic feet

Inherent carbon dioxide emission factor of feedstock, metric tons CO2 per consumption unit

55.5

Heating value of feedstock, MWh per consumption unit

270

Heating value

LHV

Comment

Figures back calculated using standard conversions as Feedstock is originally measured in MWh as per fuel above.

Using the feedstock data provided here and the fuel consumption data provided in C8.2c to calculate GHG emissions does not take into account the carbon that leaves HYCO plants as product. Not all of the carbon feedstock is emitted in the form of a greenhouse gas, because a portion is captured and sold as product (for example, Linde sells CO2 to beverage makers for carbonation).

Fuels used as feedstocks

Heavy fuel oil

Total consumption

229

Total consumption unit

thousand metric tons

Inherent carbon dioxide emission factor of feedstock, metric tons CO2 per consumption unit

3,412

Heating value of feedstock, MWh per consumption unit

12,000

Heating value

HHV

Comment

Figures back calculated using standard conversions as Feedstock originally measured in MWh as per fuel above

---

Fuels used as feedstocks

Naphtha

Total consumption

240

Total consumption unit

thousand metric tons

Inherent carbon dioxide emission factor of feedstock, metric tons CO2 per consumption unit

3,800

Heating value of feedstock, MWh per consumption unit

13,300

Heating value

HHV

Comment

Figures back calculated using standard conversions as Feedstock originally measured in MWh as per fuel above.

Using the feedstock data provided here and the fuel consumption data provided in C8.2c to calculate GHG emissions does not take into account the carbon that leaves HYCO plants as product. Not all of the carbon feedstock is emitted in the form of a greenhouse gas, because a portion is captured and sold as product (for example, Linde sells CO2 to beverage makers for carbonation).

Fuels used as feedstocks

Other, please specify

Range of fuels and customer waste gases

Total consumption

39,969

Total consumption unit

million cubic feet

Inherent carbon dioxide emission factor of feedstock, metric tons CO2 per consumption unit

65

Heating value of feedstock, MWh per consumption unit

240

Heating value

HHV

Comment

Figures back calculated using standard conversions as Feedstock originally measured in MWh, average values calculated across range of fuels consumed as feedstocks

C-CH8.3b

(C-CH8.3b) State the percentage, by mass, of primary resource from which your chemical feedstocks derive.

	Percentage of total chemical feedstock (%)
Oil	4
Natural Gas	85
Coal	0
Biomass	0
Waste (non-biomass)	0
Fossil fuel (where coal, gas, oil cannot be distinguished)	11
Unknown source or unable to disaggregate	0

C9. Additional metrics

C9.1

(C9.1) Provide any additional climate-related metrics relevant to your business.

C-CH9.3a

(C-CH9.3a) Provide details on your organization's chemical products.

Output product

Specialty chemicals

Production (metric tons)

0

Capacity (metric tons)

0

Direct emissions intensity (metric tons CO2e per metric ton of product)

0

Electricity intensity (MWh per metric ton of product)

0

Steam intensity (MWh per metric ton of product)

0

Steam/ heat recovered (MWh per metric ton of product)

0

Comment

This information is considered business confidential

C-CE9.6/C-CG9.6/C-CH9.6/C-CN9.6/C-CO9.6/C-EU9.6/C-MM9.6/C-OG9.6/C-RE9.6/C-ST9.6/C-TO9.6/C-TS9.6

(C-CE9.6/C-CG9.6/C-CH9.6/C-CN9.6/C-CO9.6/C-EU9.6/C-MM9.6/C-OG9.6/C-RE9.6/C-ST9.6/C-TO9.6/C-TS9.6) Does your organization invest in research and development (R&D) of low-carbon products or services related to your sector activities?

	Investment in low-carbon R&D	Comment
Row 1	Yes	Linde believes that it can benefit from business opportunities arising from governmental regulation of GHG and other emissions and the increasing demand for low-carbon products and applications. Linde is a technology leader and at the forefront of innovation when it comes to low-carbon products and services. Already today low carbon applications and services help Linde customers to avoid CO2. This was about 85 million metric tons of CO2 equivalents in 2020, equaling 2.3 times the (scope 1 and 2) emissions emitted by all Linde operations. Linde has set itself targets to invest more than 33% of its annual R&D budget in low-carbon products and applications until 2028 and to further invest over 1 billion of capital expenditures in low carbon projects till 2028. In 2020, Linde invested 26% of its total annual R&D budget (152 million USD) in low carbon product and service developments.

C-CH9.6a

(C-CH9.6a) Provide details of your organization's investments in low-carbon R&D for chemical production activities over the last three years.

Technology area	Stage of development in the reporting year	Average % of total R&D investment over the last 3 years	R&D investment figure in the reporting year (optional)	Comment
Unable to disaggregate by technology area		21 - 40%	40,000,000	Linde's portion of R&D investment in low-carbon technologies has increased steadily from 2018-2020, from 23% to 26%. Linde plans to achieve a 33% share of annual R&D related to decarbonization topics by 2028. Linde is active in all

				technology areas listed in the drop down apart from biotechnology. Linde considers information about the shares of the single R&D activities as part of total R&D budget as business confidential. In each technology area Linde is doing permanent research, this means that there are developments within each technology area which are already in small- and large-scale deployment, others are just in a pilot stage or in the middle of the R&D process. For example: Linde is continuously working on improving its operational processes and plant design to make it more energy and GHG efficient. For example, there is a target to achieve 0.7% energy efficiency improvement per year for Linde's ASU operations. There are many developments which have already been deployed in the past to new or existing plants, others are still in a development or pilot stage. Same is true for the areas of carbon capture or other technology areas where Linde has already deployed solutions, but still working and doing research to continuously improve applications and make those more efficient. For example, in the latest developments in carbon capture and utilization: Linde plans to build a demonstration carbon capture plant in Springfield, Illinois and recently performed a study for carbon capture for one of its largest SMR-H2 plants in the Gulf Coast.

C10. Verification

C10.1

(C10.1) Indicate the verification/assurance status that applies to your reported emissions.

	Verification/assurance status
Scope 1	Third-party verification or assurance process in place
Scope 2 (location-based or market-based)	Third-party verification or assurance process in place
Scope 3	Third-party verification or assurance process in place

C10.1a

(C10.1a) Provide further details of the verification/assurance undertaken for your Scope 1 emissions, and attach the relevant statements.

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

Linde eKPI Assurance Statement 2020 Data Year_ July 27 2021.pdf

Page/ section reference

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Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

C10.1b

(C10.1b) Provide further details of the verification/assurance undertaken for your Scope 2 emissions and attach the relevant statements.

Scope 2 approach

Scope 2 market-based

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

Linde eKPI Assurance Statement 2020 Data Year_ July 27 2021.pdf

Page/ section reference

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Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

C10.1c

(C10.1c) Provide further details of the verification/assurance undertaken for your Scope 3 emissions and attach the relevant statements.

Scope 3 category

Scope 3: Downstream transportation and distribution

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

Linde eKPI Assurance Statement 2020 Data Year_ July 27 2021.pdf

Page/section reference

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Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

C10.2

(C10.2) Do you verify any climate-related information reported in your CDP disclosure other than the emissions figures reported in C6.1, C6.3, and C6.5?

Yes

C10.2a

(C10.2a) Which data points within your CDP disclosure have been verified, and which verification standards were used?

Linde eKPI Assurance Statement 2020 Data Year_ July 27 2021.pdf

Disclosure module verification relates to	Data verified	Verification standard	Please explain
C5. Emissions performance	Year on year change in emissions (Scope 2)	The verification protocol employed for verification of Linde plc's 2018 GHG emissions was ISO 14064-3 (2006): Specification with guidance for the validation and verification of greenhouse gas assertions, and is consistent with the requirements for ISAE 3000.	Change in market-based scope 2 emissions has been verified. See attachment, page 2. Linde has the change in Scope 2 emissions verified because it directly relates to Linde's climate change targets to double its renewable energy sourcing, which plays a large role in our target to improve GHG efficiency by EBITDA by 35% by 2028. 1
C8. Energy	Energy consumption	The verification protocol employed for verification of Linde plc's 2018 GHG emissions was ISO 14064-3 (2006): Specification with guidance for the	Total non-renewable fuel, electricity and steam consumption have been verified including the break-down into fossil and low-carbon components, as well as split into active and passive renewable electricity procured. See attachment, page 2. Verifying the sources of GHG emissions is an important aspect of ensuring our

		validation and verification of greenhouse gas assertions, and is consistent with the requirements for ISAE 3000.	GHG emissions data is complete and accurate. 1

[1]Linde eKPI Assurance Statement 2020 Data Year_ July 27 2021.pdf

C11. Carbon pricing

C11.1

(C11.1) Are any of your operations or activities regulated by a carbon pricing system (i.e. ETS, Cap & Trade or Carbon Tax)?

Yes

C11.1a

(C11.1a) Select the carbon pricing regulation(s) which impacts your operations.

California CaT - ETS
EU ETS
Fujian pilot ETS
Shanghai pilot ETS
Singapore carbon tax

C11.1b

(C11.1b) Complete the following table for each of the emissions trading schemes you are regulated by.

California CaT

% of Scope 1 emissions covered by the ETS

0.5

% of Scope 2 emissions covered by the ETS

0

Period start date

January 1, 2020

Period end date

December 31, 2020

Allowances allocated

0

Allowances purchased
0

Verified Scope 1 emissions in metric tons CO2e
74,395

Verified Scope 2 emissions in metric tons CO2e
0

Details of ownership
Facilities we own and operate

Comment
The state has not yet determined the amount of allowances.

EU ETS

% of Scope 1 emissions covered by the ETS
8

% of Scope 2 emissions covered by the ETS
0

Period start date
January 1, 2020

Period end date
December 31, 2020

Allowances allocated
871,784

Allowances purchased
413,656

Verified Scope 1 emissions in metric tons CO2e
1,286,440

Verified Scope 2 emissions in metric tons CO2e
0

Details of ownership
Facilities we own and operate

Comment

Fujian pilot ETS

% of Scope 1 emissions covered by the ETS
0

% of Scope 2 emissions covered by the ETS

0.6

Period start date

January 1, 2020

Period end date

December 31, 2020

Allowances allocated

0

Allowances purchased

0

Verified Scope 1 emissions in metric tons CO2e

0

Verified Scope 2 emissions in metric tons CO2e

125,000

Details of ownership

Facilities we own and operate

Comment

Amount of allowances hasn't yet been determined by the Fujian provincial government for 2020

Shanghai pilot ETS

% of Scope 1 emissions covered by the ETS

0

% of Scope 2 emissions covered by the ETS

0.9

Period start date

January 1, 2020

Period end date

December 31, 2020

Allowances allocated

0

Allowances purchased

0

Verified Scope 1 emissions in metric tons CO2e

0

Verified Scope 2 emissions in metric tons CO2e

184,000

Details of ownership

Facilities we own and operate

Comment

Amount of allowances hasn't yet been determined by the Shanghai municipal government for 2020.

C11.1c

(C11.1c) Complete the following table for each of the tax systems you are regulated by.

Singapore carbon tax

Period start date

January 1, 2020

Period end date

December 31, 2020

% of total Scope 1 emissions covered by tax

0.7

Total cost of tax paid

440,000

Comment

Cost of tax per ton of scope 1 emissions was 5 Singapore dollars in 2020.

C11.1d

(C11.1d) What is your strategy for complying with the systems you are regulated by or anticipate being regulated by?

Linde participates in GHG emissions trading programs wherever they apply: California's Greenhouse Gas Cap and Trade program, Singapore's carbon tax, EU ETS and two pilot emissions trading schemes in China. Linde's strategy for complying with these systems is embedded in our overall climate strategy.

In order to manage risk from current and emerging carbon legislation, Linde actively monitors regulatory developments, increases relevant resources and training as needed; consults with vendors, insurance providers and industry experts; incorporates GHG provisions in commercial agreements; conducts regular sensitivity analyses of the impacts of potential energy and raw material cost increases; presents to the Office of the Chairman and Board on various cost scenarios under different potential GHG tax regimes; and explores renewable energy options.

Linde's commercial contracts routinely provide rights to recover increased electricity, natural gas and other costs that are incurred by the company. Linde estimates that in a majority of cases, the price increases incurred by carbon legislation can be passed on to customers over Linde's standard contracts.

Linde also includes information on carbon risk (e.g., from emerging legislation) and selected climate KPIs in each investment proposal to the Management Committee. The company presents GHG intensity and related climate KPIs monthly to the CFO and management team. In addition, the company has recently implemented an internal carbon price reflecting climate-related risks, including risk from carbon legislation, in order to be used to inform investment decisions and carry out scenario evaluations.

To further manage the risk from carbon legislation and comply with current and future carbon schemes, the company has enterprise-wide energy and climate goals that require GHG intensity improvements at hydrogen plants and energy savings from all business units. These goals are achieved through a range of emissions reduction measures, e.g., use of abatement technology and continuous improvement in energy efficiency.

However, efficiency measures can only mitigate the risk from carbon legislation to a certain extent. Until new technologies like CCS or green hydrogen are widely applied, industries like the chemical industry will still be subject to different emission regulation schemes or not be able to completely comply with the reduction paths targeted by regulators. However, regulatory bodies acknowledge that, for our industry, the required reductions in emissions cannot happen in the short term and need to be balanced with economic viability. Therefore, Linde receives free allowances from regulators for a substantial part of its emissions that are subject to cap and trade schemes. For the EU ETS, it has only recently been decided that Linde will receive free allowances for the 4th trading period starting 2021, although there is no guarantee of the exact amount of those allowances.

Case Study:
At several sites in Europe, Linde operates Steam Methane Reformers, which use a natural gas feedstock to produce Hydrogen and Carbon Monoxide for pipeline customers and capture the excess heat as steam. In order to operate, these plants have to comply with the rules of the EU Emissions Trading Scheme. Each plant has, therefore, been allocated a benchmark emission in metric tons of CO2/year; however, to incentivize efficiency and promote emission reductions, the actual number of free allowances each EU ETS installation receives decreases every year. To minimize the number of CO2 allowances it has to procure to make up that shortfall, Linde has a target to improve GHG efficiency at all its H2 plants by 4% by 2028; in the EU, this has reduced Linde’s average CO2 emissions compared with business-as-usual. To accomplish these reductions, Linde benchmarks all of its production processes against one another and runs many of them through remote operating centers coordinated by the Global Center of Excellence. Centralizing control and performance through the operating centers facilitates the implementation of process improvements and allows best practices to be shared more rapidly across sites. In 2020, Linde’s H2 plants achieved a 7.1% cumulative reduction in GHG intensity compared to 2018.

C11.2

(C11.2) Has your organization originated or purchased any project-based carbon credits within the reporting period?

No

C11.3

(C11.3) Does your organization use an internal price on carbon?

Yes

C11.3a

(C11.3a) Provide details of how your organization uses an internal price on carbon.

Objective for implementing an internal carbon price

Navigate GHG regulations
Stakeholder expectations
Change internal behavior
Drive energy efficiency
Drive low-carbon investment
Identify and seize low-carbon opportunities

GHG Scope

Scope 1
Scope 2

Application

The internal carbon price is applied company-wide to large backlog investments.

For large backlog investments, Linde applies a shadow carbon price in its investment evaluation and decision-making process, in order to consider among others risks from upcoming carbon legislation in the business case and project calculations. Linde took several steps to increase awareness among leadership about the company’s GHG impacts and to enhance consideration of non-financial matters in its decision-making processes. In addition to the internal carbon price, Linde now includes GHG intensity and related climate KPIs in its monthly reporting to the CFO and management team on operational performance as well as in its investment decision process, along with information on carbon risks and opportunities.

Actual price(s) used (Currency /metric ton)

25

Variance of price(s) used

A uniform price is currently being used. The price may evolve over time, subject to changing influencing parameters like increases in carbon taxation.

Type of internal carbon price

Shadow price

Impact & implication

The analysis of the risks on investments with an internal carbon price allows Linde to ensure the long-term sustainability and commercial viability of its customers operations, thereby mitigating an inherent risk of the long-term business relationships typical of its supply contracts. For backlog investments, the potential costs and financial exposure which could result from a carbon tax or other legislation is reflected in the price of gas supply and paid or indemnified by the customer.

C12. Engagement

C12.1

(C12.1) Do you engage with your value chain on climate-related issues?

Yes, our suppliers
Yes, our customers

C12.1a

(C12.1a) Provide details of your climate-related supplier engagement strategy.

Type of engagement

Engagement & incentivization (changing supplier behavior)

Details of engagement

Offer financial incentives for suppliers who reduce your operational emissions (Scopes 1 &2)
Offer financial incentives for suppliers who reduce your downstream emissions (Scopes 3)
Other, please specify
The supplier offers financial incentives to its customers like Linde who can reduce energy consumption.

% of suppliers by number

26

% total procurement spend (direct and indirect)

0

% of supplier-related Scope 3 emissions as reported in C6.5

28

Rationale for the coverage of your engagement

Linde participates in energy efficiency and energy reduction programs offered by electricity suppliers. Linde is able to implement technology solutions through these programs that otherwise might not be cost effective. Electricity suppliers are also chosen for engagement because they represent the largest portion of Linde's Scope 3 GHG footprint. Fuel and energy related emissions represent 37% of Linde's Scope 3 footprint. Subtracting out upstream emissions from purchased fuel, upstream electricity and T&D losses represent 33%. We mostly include utilities supplying our air separation units (ASUs) in our engagement, since these are our largest electricity users and account for 85% of Linde's Scope 2 emissions. Scope 3 electricity from upstream electricity and T&D losses from ASUs accounts for 28% of Linde's Scope 3 emissions.

Impact of engagement, including measures of success

Engaging with energy providers is a win-win for Linde. In the U.S., many utility companies are required by state renewable portfolio standards to ensure that a percentage of electricity they sell comes from renewable sources. Working with their customers (like Linde), utilities can achieve this by incentivizing energy efficiency, which can reduce the amount of non-renewable power needed. Linde, by participating in these programs, reduces energy use and avoids GHG emissions, and saves money. Cost savings is a primary driver for these programs. For Linde, energy is a large cost factor, representing 25-30 percent of Linde's operational costs. We measure impact of our engagement by reductions in energy use. For example: In 2019, Linde’s Ecorse, Michigan, industrial gases production complex partnered with the local electric utility DTE Electric, the largest electric utility in Michigan, to develop and commission a new state-of-the-art air separation unit that improved supply reliability for customers and resulted in an ~100 million kWh per year improvement in energy efficiency for the complex. DTE approved the project for energy efficiency incentives under its Michigan Public Service Commission approved program.

Comment

Type of engagement

Information collection (understanding supplier behavior)

Details of engagement

Collect climate change and carbon information at least annually from suppliers

% of suppliers by number

100

% total procurement spend (direct and indirect)

100

% of supplier-related Scope 3 emissions as reported in C6.5

0

Rationale for the coverage of your engagement

100% of contracted suppliers are required to follow Linde's terms and conditions in the contracts they sign with us. The terms and conditions include a reference to Linde's Supplier Code of Conduct and require suppliers to demonstrate compliance with the requirements of the Code. The Supplier Code includes a section on health, safety and environment, and outlines Linde's expectations of suppliers to commit to continuous improvement of environmental protection and support Linde's programs and targets related to climate change. Linde engages with these suppliers in order to collect information about their climate change initiatives and performance, promote increased awareness and develop collaborative and mutually beneficial relationships.

Impact of engagement, including measures of success

As part of the standard documentation for all new and renewing contracts, suppliers must confirm conformance with Linde's Supplier Code of Conduct. Linde's procurement function performs supplier audits and assessments and as part of this process, evaluates conformance with the terms and conditions in a supplier's contract. These audits and assessments are conducted based on an evaluation of certain risks in the supply chain, including safety and environmental risks. Suppliers are audited on a planned schedule. If deviations are discovered, Linde is committed to work with suppliers on remedies through capacity building, education and training. As part of confirming conformance, suppliers provide Linde with information on sustainability initiatives, including projects they have undertaken that reduce their GHG emissions. GHG reductions by suppliers reduce Linde's value chain carbon footprint. Linde measures the success of these engagements by collecting information on these GHG reduction and other sustainability initiatives. The level of detail provided by suppliers is increasing. Example: As part of their general sustainability programs and their supply agreements and engagements with Linde, two of our global cylinder manufacturers undertook to reduce the CO2 emitted and water used per cylinder sold to Linde. Based on annual sales to Linde, these combined savings were >500MT CO2e and >300,000 M3 potable water.

Comment

C12.1b

(C12.1b) Give details of your climate-related engagement strategy with your customers.

Type of engagement

Education/information sharing

Details of engagement

Run an engagement campaign to educate customers about the climate change impacts of (using) your products, goods, and/or services

% of customers by number

100

% of customer - related Scope 3 emissions as reported in C6.5

0

Please explain the rationale for selecting this group of customers and scope of engagement

Linde communicates climate-related information, including our performance, targets, activities, and details of our sustainability portfolio of products, to all of our customers. Linde does not calculate/disclose customer-related scope 3 emissions, therefore we entered 0 into the field for customer-related scope 3 emissions.
Linde engages with customers to foster an understanding of Linde's sustainability and climate change activities and further our mission of making our world - and our customers - more productive. Introduction to and highlights of Linde's SD and climate change activities, performance and recognition are included in our corporate as well as opportunity-specific business development presentations. It is simply how we do business and how we engage with existing and prospective clients. Linde communicates climate-related information to any customer that requests such data. For example, Linde responds to customer requests through CDP's Supply Chain program and scored well above industry average each year. In addition, Linde provides detailed sustainability and climate-related information to strategic customers over several global supplier portals such as Ecovadis and Integrity Next. We also complete many customer sustainability and climate change surveys, assessments and questionnaires throughout the year, as well as specific information requests by customers, e.g., on Linde's certifications or product carbon footprint. Linde also organizes customer days in each region where we operate, where all customers are invited to discuss any topic, including climate change. Linde has 2 targets that are supported by a strong customer engagement process: to avoid more than two times the GHG emissions from our own operations, and to annually earn >50% revenue from products in our sustainability portfolio.

Achieving these targets depends on our customers being aware of our efforts to reduce our own carbon footprint as well as invest in products that will help them reduce their footprint. Customers interested in products that are part of our sustainability portfolio accounted for 54% of Linde's revenue in 2020. A subset of this portfolio helped customers avoid 85 million metric tons of CO_2e emissions in 2020.

Impact of engagement, including measures of success

Linde measures revenue earned from our sustainability portfolio and estimates the amount of GHG emissions avoided by using 5 key applications that reduce customers' GHG footprint. By providing all current and potential customers with information related to our low carbon products and our own activities to reduce emissions, we expect to see these metrics increase over time. Measures of success: A positive impact of our customer engagement is the reduction in customers' GHG emissions.
For example, customers who use our hydrogen in ultra-low sulfur diesel avoided 58.5 million metric tons of CO_2e in 2020. In all, the use of 5 of Linde's applications enabled 85 million metric tons of CO_2e to be avoided, which is 2.3 times more than Linde's total Scopes 1+2 emissions. Customers looking for products that have a social or environmental benefit (Linde's sustainability portfolio) contributed 54% of Linde's revenue in 2020, or $14.7 billion. Linde teams up with customers to work on low-carbon solutions and new technologies. For example, Linde teamed up with BASF to develop

its OASE blue technology for carbon capture from air effluents. This collaboration led to a turnkey solution for carbon capture that is now part of Linde's sustainability portfolio. We measure the number of customer requests regarding climate related topics. This number has increased steadily over the years, reflecting rising customer interest in Linde's climate activities and KPIs and in best practice sharing/ learning from Linde. We believe that this increased customer interest can be attributed in part to Linde's SD information sharing, our climate change activities and the recognition these have garnered. We've found that the exchange of ideas, practices and performance around sustainability can be a critical element to developing strategic relationships with our customers. We see that sharing of our sustainability and climate activities, targets and performance, has led to improved customer relationships and maintained our high rates of customer retention as customers acknowledge our activities and performance with regards to environment and climate change.

C12.3

(C12.3) Do you engage in activities that could either directly or indirectly influence public policy on climate-related issues through any of the following?

Direct engagement with policy makers

Trade associations

C12.3a

(C12.3a) On what issues have you been engaging directly with policy makers?

Focus of legislation	Corporate position	Details of engagement	Proposed legislative solution
Clean energy generation	Support	Linde engages with political decision-makers in the U.S. (e.g., United States Congress), in Europe (e.g., EU Commission, Member States) and other geographies promoting the benefits of clean hydrogen and the respective technologies as key to the transition to a low carbon economy with a particular view to industrial manufacturing, mobility and clean power generation.	Linde supports the introduction of support schemes, programs and other policy instruments that encourage the use of clean hydrogen. As founding member of the Hydrogen Council, a global CEO-led initiative of leading companies, Linde promotes the vision and long-term goal of hydrogen to drive the clean energy transition for a climate-neutral and sustainable economy.
Climate finance	Undecided	Linde engaged with policymakers in the EU and its Member States on the emerging EU taxonomy legislation, particularly on the omission of air gases and the proposed thresholds in the technical screening criteria.	Linde supports the aim of the EU taxonomy to provide additional transparency and science-based criteria for the assessment of activities regarding sustainability but calls for additions and changes to the proposed legislation.

C12.3b

(C12.3b) Are you on the board of any trade associations or do you provide funding beyond membership?

Yes

C12.3c

(C12.3c) Enter the details of those trade associations that are likely to take a position on climate change legislation.

Trade association

European Industrial Gases Association (EIGA)

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

EIGA supports European climate targets and highlights the role of the industrial gases sector in the transition to a carbon-neutral and circular economy. EIGA calls for sufficient reliable and affordable electricity from renewable sources to enable industry to meet ambitious climate policy targets but also warns against significant increases in production costs. In this context, EIGA stresses the need for continued protection of energy-intensive industries from carbon leakage and urges policymakers to avoid intersectoral market distortions (e.g., inequality for outsourced production of industrial gases) which would counteract the broadly recognized environmental & economic benefits of industrial gases products.

How have you influenced, or are you attempting to influence their position?

Linde is represented in the board of EIGA and in several of its committees and working groups and actively contributes to the association's internal and external positioning.

Trade association

German Chemical Industry Association (VCI)

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

VCI supports the goal of greenhouse gas neutrality by 2050 and acknowledges the aim of the energy transition in Germany to make energy supplies climate-friendly, reliable, and affordable. VCI considers the EU emissions trading as the key instrument for achieving climate targets and maintaining competitiveness but warns against risk of double regulation and additional burdens for industrial installations with a view to the introduction of the national emissions trading system in Germany. In view of ambitious climate policy goals, VCI calls for continuation and improvement of “carbon leakage” protection and rejects carbon border protection mechanism.

How have you influenced, or are you attempting to influence their position?

Linde is represented in the VCI executive committee as well as other committees and working groups and actively contributes to the internal and external positioning of the association.

Trade association

German Engineering Association (VDMA)

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association’s position

From the perspective of the VDMA climate policy goals are ambitious, but not impossible as technical solutions to significantly reduce greenhouse gas emissions are already available today. Against this background VDMA calls upon policymakers in Germany for acceleration of the deployment of renewables through improved planning and permitting processes, the establishment of global emissions trading opportunities, a true hydrogen economy, and common standards for sustainable product design, to enable a well-functioning secondary raw materials market.

How have you influenced, or are you attempting to influence their position?

Linde is represented on the board of the Working Group for Large Plant Engineering (AGAB) within VDMA and participates in further committees and working groups. Linde actively contributes to the association’s internal decision-making process.

C12.3f

(C12.3f) What processes do you have in place to ensure that all of your direct and indirect activities that influence policy are consistent with your overall climate change strategy?

Linde has a strong global ethics and compliance program. Linde maintains a detailed oversight process to ensure our activities are conducted in a legal, ethical and transparent manner and are consistent across business units and geographies. This includes oversight by the Chief Compliance Officer and an annual program review by the Board of Directors. Linde's Government Relations department provides regular reporting on such activities to the Chief Compliance Officer and reports to the General Counsel.

In addition, all Linde employees are certified on issues related to doing business with the government, complying with anti-trust and competition laws, and the U.S. Foreign Corrupt Practices Act (FCPA).

Finally, there is coordination with the Chief Sustainability Officer or Senior Director, Sustainability, and General Counsel to ensure consistency of public policy advocacy with Linde's global sustainability strategy, including our energy and GHG strategy. The Chief

Sustainability Officer or Senior Director, Sustainability works closely with Government Relations and participates in cross-functional groups to review advocacy positions that have an environmental or climate change impact. In turn, Government Relations has a seat on the Sustainable Development Council, which meets quarterly.

C12.4

(C12.4) Have you published information about your organization's response to climate change and GHG emissions performance for this reporting year in places other than in your CDP response? If so, please attach the publication(s).

Publication

In mainstream reports

Status

Complete

Attach the document

LIN 2020 IFRS Financial Report.pdf

Page/Section reference

127

Content elements

Governance
Strategy
Risks & opportunities
Emission targets
Other metrics

Comment

Publication

In voluntary sustainability report

Status

Underway – previous year attached

Attach the document

Sustainable Development Report and Annex 2019_final.pdf

Page/Section reference

16-23, 55-67

Content elements

Governance
Strategy
Risks & opportunities
Emissions figures
Emission targets
Other metrics

Comment

Linde's 2020 SD Report will be published shortly and will be available at the following link: https://www.linde.com/sustainable-development/2020/sustainable-development-report

C15. Signoff

C-FI

(C-FI) Use this field to provide any additional information or context that you feel is relevant to your organization's response. Please note that this field is optional and is not scored.

C15.1

(C15.1) Provide details for the person that has signed off (approved) your CDP climate change response.

	Job title	Corresponding job category
Row 1	Executive Vice President, Clean Energy	Other C-Suite Officer

SC. Supply chain module

SC0.0

(SC0.0) If you would like to do so, please provide a separate introduction to this module.

Linde sees inquiries such as this as opportunities. Building on our technological and business innovation, we are eager to showcase our Eco-Efficiency and Green Technologies portfolio and demonstrate how we might support customers sustainability efforts and help improve environmental performance, increase energy efficiency and increase production process throughput or yield.

Linde has established climate change targets through 2028 (with a 2018 baseline). Linde has four targets in the area of decarbonization and growth. Linde targets to invest more than $1 billion and contribute >1/3 of the annual R&D budget to decarbonization initiatives. Since 2018, Linde has invested a cumulative $128 million. In 2020, Linde also approved an investment in the largest electrolyzer globally (24MW). This is projected to be operational in mid-2022. Linde invested 26 percent of its 2020 R&D budget ($152 million) into decarbonization. Linde also targets to contribute >50% annual sales from its Sustainability Portfolio and enable >2x annual carbon productivity. In 2020, 54% of Linde's revenue came from the Sustainability Portfolio with 34% in environmental innovation and a subset of Linde's applications enabled 85 million MT CO_2e to be avoided which is 2.3x more than emitted (37.2 million MT CO_2e).

The remaining climate change targets are in optimizing operational energy use and GHG emissions. Linde's 2020 Scope 1 GHG emissions were 16.2 MM MT CO_2e. These were caused mainly by hydrogen production (65 percent) in SMRs. An additional 18 percent Scope 1 emissions were caused by "other" sources of GHG (e.g., nitrous oxide or other plants): 13 percent from air separation, where air separation units (ASUs) are run on natural gas; and 4 percent from driving. Targets to improve GHG intensity improvement in hydrogen production, other GHG emissions and driving address these sources. Linde's Scope 2 GHG emissions were 21 MM MT CO_2e. These were caused by the use of electricity and steam, a portion of which comes from fossil fuel sources. Electricity is principally (90 percent) used by air separation plants and is tracked with the air separation energy efficiency target. An additional 5 percent of the electricity is used in hydrogen production. Targets to improve energy efficiency in ASUs and to increase low-carbon sourcing address this issue. In 2020, these targets are on track. More details can be found on page 19 of the Linde 2020 Sustainable Development Report (SDR), which is located online in our sustainable development reporting center: https://www.linde.com/about-linde/sustainable-development/reporting-center, and Linde Sustainable Development targets and performance on our web site: https://www.linde.com/about-linde/sustainable-development/targets-and-performance.

SC0.1

(SC0.1) What is your company's annual revenue for the stated reporting period?

	Annual Revenue
Row 1	27,243,000,000

SC0.2

(SC0.2) Do you have an ISIN for your company that you would be willing to share with CDP?

Yes

SC0.2a

(SC0.2a) Please use the table below to share your ISIN.

	ISIN country code (2 letters)	ISIN numeric identifier and single check digit (10 numbers overall)
Row 1	IE	00BZ12WP82

SC1.1

(SC1.1) Allocate your emissions to your customers listed below according to the goods or services you have sold them in this reporting period.

Requesting member

ARKEMA

Scope of emissions

Scope 1

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

63

Uncertainty (±%)

20

Major sources of emissions

Liquid nitrogen, liquid argon, hydrogen, and packaged gases. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to allocate distribution kilometers. For Scope 1 emissions: If product was transported by truck, estimated kilometers driven to deliver product, if possible. We assumed a fuel rate of 37.1l per 100 kilometers and converted liters to CO2e using the EIGA conversion rates. NOTE: This conversion factor will over-estimate the CO2e: the product being delivered to a particular customer may be part of a less than a full truckload delivery (i.e., multiple deliveries to several customers from the same truckload of product). It will improve the impact product CO2e per delivery kilometer driven. For package/cylinder gases, allocation of kilometers when there are

multiple products and shipments for multiple customers in an area is a significant challenge. In most cases, these emission allocations are not included.

Requesting member

ARKEMA

Scope of emissions

Scope 2

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

5,793

Uncertainty (±%)

20

Major sources of emissions

Liquid nitrogen, liquid argon, hydrogen, and packaged gases. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to capture sales volume to customers from disparate systems. For Scope 2 Emissions: Each business provided the volume of product(s) sold to each customer and the primary supply plant. We used a benchmark conversion factor for energy used in the production per unit of product and then country emission factors (EFs) to determine the CO2e per product. Scope 2 emissions are calculated for product nitrogen, oxygen, argon, and carbon dioxide only.

Requesting member

Bayer AG

Scope of emissions
Scope 1

Allocation level
Company wide

Allocation level detail

Emissions in metric tonnes of CO2e
33

Uncertainty (±%)
20

Major sources of emissions
Liquid nitrogen, liquid oxygen, liquid argon, pipeline gaseous nitrogen, pipeline gaseous oxygen, liquid carbon dioxide, and packaged gases. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. CO2 is sourced as a byproduct and purified, then liquefied for transport. Linde has long been a practitioner of what is called "Byproduct Synergy", which is leveraged in our CO2 sourcing. Example: https://www.linde-engineering.com/en/about-linde-engineering/success-stories/ecosourcing-raw-carbon-dioxide.html
Linde also sources a portion of CO2 from ethanol fermentation (a biomass source). In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified
No

Allocation method
Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
This figure represents best effort to allocate distribution kilometers. For Scope 1 emissions: If product was transported by truck, estimated kilometers driven to deliver product, if possible. We assumed a fuel rate of 37.1l per 100 kilometers and converted liters to CO2e using the EIGA conversion rates. NOTE: This conversion factor will over-estimate the CO2e: the product being delivered to a particular customer may be part of a less than a full truckload delivery (i.e., multiple deliveries to several customers from the same truckload of product). It will improve the impact product CO2e per delivery kilometer driven. For package/cylinder gases, allocation of kilometers when there are multiple products and shipments for multiple customers in an area is a significant challenge. In most cases, these emission allocations are not included.

Requesting member

Bayer AG

Scope of emissions

Scope 2

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

8,617

Uncertainty (±%)

20

Major sources of emissions

Liquid nitrogen, liquid oxygen, liquid argon, pipeline gaseous nitrogen, pipeline gaseous oxygen, liquid carbon dioxide, and packaged gases. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. CO2 is sourced as a byproduct and purified, then liquefied for transport. Linde has long been a practitioner of what is called "Byproduct Synergy", which is leveraged in our CO2 sourcing. Example: https://www.linde-engineering.com/en/about-linde-engineering/success-stories/ecosourcing-raw-carbon-dioxide.html

Linde also sources a portion of CO2 from ethanol fermentation (a biomass source). In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to capture sales volume to customers from disparate systems. For Scope 2 Emissions: Each business provided the volume of product(s) sold to each customer and the primary supply plant. We used a benchmark conversion factor for energy used in the production per unit of product and then country emission factors (EFs) to determine the CO2e per product. Scope 2 emissions are calculated for product nitrogen, oxygen, argon, and carbon dioxide only.

Requesting member

Braskem S/A

Scope of emissions

Scope 1

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

1,085

Uncertainty (±%)

20

Major sources of emissions

Liquid nitrogen, liquid carbon dioxide, pipeline gaseous nitrogen, pipeline gaseous oxygen, hydrogen and packaged gases. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. CO2 is sourced as a byproduct and purified, then liquefied for transport. Linde has long been a practitioner of what is called "Byproduct Synergy", which is leveraged in our CO2 sourcing. Example: https://www.linde-engineering.com/en/about-linde-engineering/success-stories/ecosourcing-raw-carbon-dioxide.html

Linde also sources a portion of CO2 from ethanol fermentation (a biomass source). In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to allocate distribution kilometers. For Scope 1 emissions: If product was transported by truck, estimated kilometers driven to deliver product, if possible. We assumed a fuel rate of 37.1l per 100 kilometers and converted liters to CO2e using the EIGA conversion rates. NOTE: This conversion factor will over-estimate the CO2e: the product being delivered to a particular customer may be part of a less than a full truckload delivery (i.e., multiple deliveries to several customers from the same truckload of product). It will improve the impact product CO2e per delivery kilometer driven. For package/cylinder gases, allocation of kilometers when there are multiple products and shipments for multiple customers in an area is a significant challenge. In most cases, these emission allocations are not included.

Requesting member

Braskem S/A

Scope of emissions

Scope 2

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

27.816

Uncertainty (±%)

20

Major sources of emissions

Liquid nitrogen, liquid carbon dioxide, pipeline gaseous nitrogen, pipeline gaseous oxygen, hydrogen and packaged gases. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. CO2 is sourced as a byproduct and purified, then liquefied for transport. Linde has long been a practitioner of what is called "Byproduct Synergy", which is leveraged in our CO2 sourcing. Example: https://www.linde-engineering.com/en/about-linde-engineering/success-stories/ecosourcing-raw-carbon-dioxide.html
Linde also sources a portion of CO2 from ethanol fermentation (a biomass source). In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to capture sales volume to customers from disparate systems. For Scope 2 Emissions: Each business provided the volume of product(s) sold to each customer and the primary supply plant. We used a benchmark conversion factor for energy used in the production per unit of product and then country emission factors (EFs) to determine the CO2e per product. Scope 2 emissions are calculated for product nitrogen, oxygen, argon, and carbon dioxide only.

Requesting member

Bristol-Myers Squibb

Scope of emissions

Scope 1

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

19

Uncertainty (±%)

20

Major sources of emissions

Liquid nitrogen, liquid oxygen, liquid argon, liquid carbon dioxide, and packaged gases. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. CO2 is sourced as a byproduct and purified, then liquefied for transport. Linde has long been a practitioner of what is called "Byproduct Synergy", which is leveraged in our CO2 sourcing. Example: https://www.linde-engineering.com/en/about-linde-engineering/success-stories/ecosourcing-raw-carbon-dioxide.html

Linde also sources a portion of CO2 from ethanol fermentation (a biomass source). In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to allocate distribution kilometers. For Scope 1 emissions: If product was transported by truck, estimated kilometers driven to deliver product, if possible. We assumed a fuel rate of 37.1l per 100 kilometers and converted liters to CO2e using the EIGA conversion rates. NOTE: This conversion factor will over-estimate the CO2e: the product being delivered to a particular customer may be part of a less than a full truckload delivery (i.e., multiple deliveries to several customers from the same truckload of product). It will improve the impact product CO2e per delivery kilometer driven. For package/cylinder gases, allocation of kilometers when there are

multiple products and shipments for multiple customers in an area is a significant challenge. In most cases, these emission allocations are not included.

Requesting member

Bristol-Myers Squibb

Scope of emissions

Scope 2

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

2,069

Uncertainty (±%)

20

Major sources of emissions

Liquid nitrogen, liquid oxygen, liquid argon, liquid carbon dioxide, and packaged gases. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. CO2 is sourced as a byproduct and purified, then liquefied for transport. Linde has long been a practitioner of what is called "Byproduct Synergy", which is leveraged in our CO2 sourcing. Example: https://www.linde-engineering.com/en/about-linde-engineering/success-stories/ecosourcing-raw-carbon-dioxide.html

Linde also sources a portion of CO2 from ethanol fermentation (a biomass source). In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to capture sales volume to customers from disparate systems. For Scope 2 Emissions: Each business provided the volume of product(s) sold to each customer and the primary supply plant. We used a benchmark conversion factor for energy used in the production per unit of product and then country emission factors (EFs) to determine the CO2e per product. Scope 2 emissions are calculated for product nitrogen, oxygen, argon, and carbon dioxide only.

Requesting member

Caesars Entertainment

Scope of emissions

Scope 1

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

2

Uncertainty (±%)

20

Major sources of emissions

Packaged gases - atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to allocate distribution kilometers. For Scope 1 emissions: If product was transported by truck, estimated kilometers driven to deliver product, if possible. We assumed a fuel rate of 37.1l per 100 kilometers and converted liters to CO2e using the EIGA conversion rates. NOTE: This conversion factor will over-estimate the CO2e: the product being delivered to a particular customer may be part of a less than a full truckload delivery (i.e., multiple deliveries to several customers from the same truckload of product). It will improve the impact product CO2e per delivery kilometer driven. For package/cylinder gases, allocation of kilometers when there are multiple products and shipments for multiple customers in an area is a significant challenge. In most cases, these emission allocations are not included.

Requesting member

Downer EDI

Scope of emissions

Scope 1

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

2

Uncertainty (±%)

20

Major sources of emissions

Liquid oxygen, liquid argon, and liquid carbon dioxide. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. CO2 is sourced as a byproduct and purified, then liquefied for transport. Linde has long been a practitioner of what is called "Byproduct Synergy", which is leveraged in our CO2 sourcing. Example: https://www.linde-engineering.com/en/about-linde-engineering/success-stories/ecosourcing-raw-carbon-dioxide.html
Linde also sources a portion of CO2 from ethanol fermentation (a biomass source). In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to allocate distribution kilometers. For Scope 1 emissions: If product was transported by truck, estimated kilometers driven to deliver product, if possible. We assumed a fuel rate of 37.1l per 100 kilometers and converted liters to CO2e using the EIGA conversion rates. NOTE: This conversion factor will over-estimate the CO2e: the product being delivered to a particular customer may be part of a less than a full truckload delivery (i.e., multiple deliveries to several customers from the same truckload of product). It will improve the impact product CO2e per delivery kilometer driven. For package/cylinder gases, allocation of kilometers when there are

multiple products and shipments for multiple customers in an area is a significant challenge. In most cases, these emission allocations are not included.

Requesting member

Downer EDI

Scope of emissions

Scope 2

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

131

Uncertainty (±%)

20

Major sources of emissions

Liquid oxygen, liquid argon, and liquid carbon dioxide. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. CO2 is sourced as a byproduct and purified, then liquefied for transport. Linde has long been a practitioner of what is called "Byproduct Synergy", which is leveraged in our CO2 sourcing. Example: https://www.linde-engineering.com/en/about-linde-engineering/success-stories/ecosourcing-raw-carbon-dioxide.html
Linde also sources a portion of CO2 from ethanol fermentation (a biomass source). In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to capture sales volume to customers from disparate systems. For Scope 2 Emissions: Each business provided the volume of product(s) sold to each customer and the primary supply plant. We used a benchmark conversion factor for energy used in the production per unit of product and then country emission factors (EFs) to determine the CO2e per product. Scope 2 emissions are calculated for product nitrogen, oxygen, argon, and carbon dioxide only.

Requesting member

Flex Ltd.

Scope of emissions

Scope 1

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

61

Uncertainty (±%)

20

Major sources of emissions

Liquid nitrogen, liquid carbon dioxide, and packaged gases. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. CO2 is sourced as a byproduct and purified, then liquefied for transport. Linde has long been a practitioner of what is called "Byproduct Synergy", which is leveraged in our CO2 sourcing. Example: https://www.linde-engineering.com/en/about-linde-engineering/success-stories/ecosourcing-raw-carbon-dioxide.html

Linde also sources a portion of CO2 from ethanol fermentation (a biomass source). In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to allocate distribution kilometers. For Scope 1 emissions: If product was transported by truck, estimated kilometers driven to deliver product, if possible. We assumed a fuel rate of 37.1l per 100 kilometers and converted liters to CO2e using the EIGA conversion rates. NOTE: This conversion factor will over-estimate the CO2e: the product being delivered to a particular customer may be part of a less than a full truckload delivery (i.e., multiple deliveries to several customers from the same truckload of product). It will improve the impact product CO2e per delivery kilometer driven. For package/cylinder gases, allocation of kilometers when there are

multiple products and shipments for multiple customers in an area is a significant challenge. In most cases, these emission allocations are not included.

Requesting member

Flex Ltd.

Scope of emissions

Scope 2

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

3,292

Uncertainty (±%)

20

Major sources of emissions

Liquid nitrogen, liquid carbon dioxide, and packaged gases. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. CO2 is sourced as a byproduct and purified, then liquefied for transport. Linde has long been a practitioner of what is called "Byproduct Synergy", which is leveraged in our CO2 sourcing. Example: https://www.linde-engineering.com/en/about-linde-engineering/success-stories/ecosourcing-raw-carbon-dioxide.html
Linde also sources a portion of CO2 from ethanol fermentation (a biomass source). In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to capture sales volume to customers from disparate systems. For Scope 2 Emissions: Each business provided the volume of product(s) sold to each customer and the primary supply plant. We used a benchmark conversion factor for energy used in the production per unit of product and then country emission factors (EFs) to determine the CO2e per product. Scope 2 emissions are calculated for product nitrogen, oxygen, argon, and carbon dioxide only.

Requesting member

Grupo CCR

Scope of emissions

Scope 1

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

1

Uncertainty (±%)

20

Major sources of emissions

Packaged gases - atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to allocate distribution kilometers. For Scope 1 emissions: If product was transported by truck, estimated kilometers driven to deliver product, if possible. We assumed a fuel rate of 37.1l per 100 kilometers and converted liters to CO2e using the EIGA conversion rates. NOTE: This conversion factor will over-estimate the CO2e: the product being delivered to a particular customer may be part of a less than a full truckload delivery (i.e., multiple deliveries to several customers from the same truckload of product). It will improve the impact product CO2e per delivery kilometer driven. For package/cylinder gases, allocation of kilometers when there are multiple products and shipments for multiple customers in an area is a significant challenge. In most cases, these emission allocations are not included.

Requesting member

Grupo CCR

Scope of emissions

Scope 2

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

0.01

Uncertainty (±%)

20

Major sources of emissions

Packaged gases - atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to capture sales volume to customers from disparate systems. For Scope 2 Emissions: Each business provided the volume of product(s) sold to each customer and the primary supply plant. We used a benchmark conversion factor for energy used in the production per unit of product and then country emission factors (EFs) to determine the CO2e per product. Scope 2 emissions are calculated for product nitrogen, oxygen, argon, and carbon dioxide only.

Requesting member

Intel Corporation

Scope of emissions

Scope 1

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

85

Uncertainty (±%)

20

Major sources of emissions

Liquid nitrogen, liquid carbon dioxide, pipeline nitrogen, and packaged electronics process gases. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. CO2 is sourced as a byproduct and purified, then liquefied for transport. Linde has long been a practitioner of what is called "Byproduct Synergy", which is leveraged in our CO2 sourcing. Example: https://www.linde-engineering.com/en/about-linde-engineering/success-stories/ecosourcing-raw-carbon-dioxide.html

Linde also sources a portion of CO2 from ethanol fermentation (a biomass source). In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to allocate distribution kilometers. For Scope 1 emissions: If product was transported by truck, estimated kilometers driven to deliver product, if possible. We assumed a fuel rate of 37.1l per 100 kilometers and converted liters to CO2e using the EIGA conversion rates. NOTE: This conversion factor will over-estimate the CO2e: the product being delivered to a particular customer may be part of a less than a full truckload delivery (i.e., multiple deliveries to several customers from the same truckload of product). It will improve the impact product CO2e per delivery kilometer driven. For package/cylinder gases, allocation of kilometers when there are multiple products and shipments for multiple customers in an area is a significant challenge. In most cases, these emission allocations are not included.

Requesting member

Intel Corporation

Scope of emissions

Scope 2

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

5,236

Uncertainty (±%)

20

Major sources of emissions

Liquid nitrogen, liquid carbon dioxide, pipeline nitrogen, and packaged electronics process gases. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. CO2 is sourced as a byproduct and purified, then liquefied for transport. Linde has long been a practitioner of what is called "Byproduct Synergy", which is leveraged in our CO2 sourcing. Example: https://www.linde-engineering.com/en/about-linde-engineering/success-stories/ecosourcing-raw-carbon-dioxide.html

Linde also sources a portion of CO2 from ethanol fermentation (a biomass source). In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to capture sales volume to customers from disparate systems. For Scope 2 Emissions: Each business provided the volume of product(s) sold to each customer and the primary supply plant. We used a benchmark conversion factor for energy used in the production per unit of product and then country emission factors (EFs) to determine the CO2e per product. Scope 2 emissions are calculated for product nitrogen, oxygen, argon, and carbon dioxide only.

Requesting member

Iochpe-Maxion SA

Scope of emissions

Scope 1

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

20

Uncertainty (±%)

20

Major sources of emissions

Liquid nitrogen, liquid oxygen, liquid argon, liquid carbon dioxide, and packaged gases. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. CO2 is sourced as a byproduct and purified, then liquefied for transport. Linde has long been a practitioner of what is called "Byproduct Synergy", which is leveraged in our CO2 sourcing. Example: https://www.linde-engineering.com/en/about-linde-engineering/success-stories/ecosourcing-raw-carbon-dioxide.html

Linde also sources a portion of CO2 from ethanol fermentation (a biomass source). In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to allocate distribution kilometers. For Scope 1 emissions: If product was transported by truck, estimated kilometers driven to deliver product, if possible. We assumed a fuel rate of 37.1 liters per 100 kilometers and converted liters to CO2e using the EIGA conversion rates. NOTE: This conversion factor will over-estimate the CO2e: the product being delivered to a particular customer may be part of a less than a full truckload delivery (i.e., multiple deliveries to several customers from the same truckload of product). It will improve the impact product CO2e per delivery kilometer driven. For package/cylinder gases, allocation of kilometers when there are multiple products and shipments for multiple customers in an area is a significant challenge. In most cases, these emission allocations are not included.

Requesting member

Iochpe-Maxion SA

Scope of emissions

Scope 2

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

290

Uncertainty (±%)

20

Major sources of emissions

Liquid nitrogen, liquid oxygen, liquid argon, liquid carbon dioxide, and packaged gases. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. CO2 is sourced as a byproduct and purified, then liquefied for transport. Linde has long been a practitioner of what is called "Byproduct Synergy", which is leveraged in our CO2 sourcing. Example: https://www.linde-engineering.com/en/about-linde-engineering/success-stories/ecosourcing-raw-carbon-dioxide.html

Linde also sources a portion of CO2 from ethanol fermentation (a biomass source). In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to capture sales volume to customers from disparate systems. For Scope 2 Emissions: Each business provided the volume of product(s) sold to each customer and the primary supply plant. We used a benchmark conversion factor for energy used in the production per unit of product and then country emission factors (EFs) to determine the CO2e per product. Scope 2 emissions are calculated for product nitrogen, oxygen, argon, and carbon dioxide only.

Requesting member

Koninklijke Philips NV

Scope of emissions

Scope 1

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

36

Uncertainty (±%)

20

Major sources of emissions

Liquid nitrogen, liquid oxygen, liquid argon, helium, and packaged gases. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to allocate distribution kilometers. For Scope 1 emissions: If product was transported by truck, estimated kilometers driven to deliver product, if possible. We assumed a fuel rate of 37.1l per 100 kilometers and converted liters to CO2e using the EIGA conversion rates. NOTE: This conversion factor will over-estimate the CO2e: the product being delivered to a particular customer may be part of a less than a full truckload delivery (i.e., multiple deliveries to several customers from the same truckload of product). It will improve the impact product CO2e per delivery kilometer driven. For package/cylinder gases, allocation of kilometers when there are multiple products and shipments for multiple customers in an area is a significant challenge. In most cases, these emission allocations are not included.

Requesting member

Koninklijke Philips NV

Scope of emissions

Scope 2

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

704

Uncertainty (±%)

20

Major sources of emissions

Liquid nitrogen, liquid oxygen, liquid argon, helium, and packaged gases. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to capture sales volume to customers from disparate systems. For Scope 2 Emissions: Each business provided the volume of product(s) sold to each customer and the primary supply plant. We used a benchmark conversion factor for energy used in the production per unit of product and then country emission factors (EFs) to determine the CO2e per product. Scope 2 emissions are calculated for product nitrogen, oxygen, argon, and carbon dioxide only.

Requesting member

Michelin

Scope of emissions

Scope 1

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

84

Uncertainty (±%)

20

Major sources of emissions

Liquid nitrogen, pipeline nitrogen, and packaged gases. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to allocate distribution kilometers. For Scope 1 emissions: If product was transported by truck, estimated kilometers driven to deliver product, if possible. We assumed a fuel rate of 37.1l per 100 kilometers and converted liters to CO2e using the EIGA conversion rates. NOTE: This conversion factor will over-estimate the CO2e: the product being delivered to a particular customer may be part of a less than a full truckload delivery (i.e., multiple deliveries to several customers from the same truckload of product). It will improve the impact product CO2e per delivery kilometer driven. For package/cylinder gases, allocation of kilometers when there are multiple products and shipments for multiple customers in an area is a significant challenge. In most cases, these emission allocations are not included.

Requesting member

Michelin

Scope of emissions

Scope 2

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

5,997

Uncertainty (±%)

20

Major sources of emissions

Liquid nitrogen, pipeline nitrogen, and packaged gases. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to capture sales volume to customers from disparate systems. For Scope 2 Emissions: Each business provided the volume of product(s) sold to each customer and the primary supply plant. We used a benchmark conversion factor for energy used in the production per unit of product and then country emission factors (EFs) to determine the CO_2e per product. Scope 2 emissions are calculated for product nitrogen, oxygen, argon, and carbon dioxide only.

Requesting member

National Grid PLC

Scope of emissions

Scope 1

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

40

Uncertainty (±%)

20

Major sources of emissions

Liquid nitrogen and packaged gases. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to allocate distribution kilometers. For Scope 1 emissions: If product was transported by truck, estimated kilometers driven to deliver product, if possible. We assumed a fuel rate of 37.1l per 100 kilometers and converted liters to CO2e using the EIGA conversion rates. NOTE: This conversion factor will over-estimate the CO2e: the product being delivered to a particular customer may be part of a less than a full truckload delivery (i.e., multiple deliveries to several customers from the same truckload of product). It will improve the impact product CO2e per delivery kilometer driven. For package/cylinder gases, allocation of kilometers when there are multiple products and shipments for multiple customers in an area is a significant challenge. In most cases, these emission allocations are not included.

Requesting member

National Grid PLC

Scope of emissions

Scope 2

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

40

Uncertainty (±%)

20

Major sources of emissions

Liquid nitrogen and packaged gases. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to capture sales volume to customers from disparate systems. For Scope 2 Emissions: Each business provided the volume of product(s) sold to each customer and the primary supply plant. We used a benchmark conversion factor for energy used in the production per unit of product and then country emission factors (EFs) to determine the CO2e per product. Scope 2 emissions are calculated for product nitrogen, oxygen, argon, and carbon dioxide only.

Requesting member

NHS England and NHS Improvement

Scope of emissions

Scope 1

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

165

Uncertainty (±%)

20

Major sources of emissions

Liquid oxygen. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to allocate distribution kilometers. For Scope 1 emissions: If product was transported by truck, estimated kilometers driven to deliver product, if possible. We assumed a fuel rate of 37.1l per 100 kilometers and converted liters to CO2e using the EIGA conversion rates. NOTE: This conversion factor will over-estimate the CO2e: the product being delivered to a particular customer may be part of a less than a full truckload delivery (i.e., multiple deliveries to several customers from the same truckload of product). It will improve the impact product CO2e per delivery kilometer driven. For package/cylinder gases, allocation of kilometers when there are multiple products and shipments for multiple customers in an area is a significant challenge. In most cases, these emission allocations are not included.

Requesting member

NHS England and NHS Improvement

Scope of emissions

Scope 2

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

260

Uncertainty (±%)

20

Major sources of emissions

Liquid oxygen. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to capture sales volume to customers from disparate systems. For Scope 2 Emissions: Each business provided the volume of product(s) sold to each customer and the primary supply plant. We used a benchmark conversion factor for energy used in the production per unit of product and then country emission factors (EFs) to determine the CO2e per product. Scope 2 emissions are calculated for product nitrogen, oxygen, argon, and carbon dioxide only.

Requesting member

PepsiCo, Inc.

Scope of emissions

Scope 1

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

1,054

Uncertainty (±%)

20

Major sources of emissions

Liquid nitrogen, liquid carbon dioxide, and packaged gases. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. CO2 is sourced as a byproduct and purified, then liquefied for transport. Linde has long been a practitioner of what is called "Byproduct Synergy", which is leveraged in our CO2 sourcing. Example: https://www.linde-engineering.com/en/about-linde-engineering/success-stories/ecosourcing-raw-carbon-dioxide.html
Linde also sources a portion of CO2 from ethanol fermentation (a biomass source). In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to allocate distribution kilometers. For Scope 1 emissions: If product was transported by truck, estimated kilometers driven to deliver product, if possible. We assumed a fuel rate of 37.1l per 100 kilometers and converted liters to CO2e using the EIGA conversion rates. NOTE: This conversion factor will over-estimate the CO2e: the product being delivered to a particular customer may be part of a less than a full truckload delivery (i.e., multiple deliveries to several customers from the same truckload of product). It will improve the impact product CO2e per delivery kilometer driven. For package/cylinder gases, allocation of kilometers when there are

multiple products and shipments for multiple customers in an area is a significant challenge. In most cases, these emission allocations are not included.

Requesting member

PepsiCo, Inc.

Scope of emissions

Scope 2

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

20,346

Uncertainty (±%)

20

Major sources of emissions

Liquid nitrogen, liquid carbon dioxide, and packaged gases. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. CO2 is sourced as a byproduct and purified, then liquefied for transport. Linde has long been a practitioner of what is called "Byproduct Synergy", which is leveraged in our CO2 sourcing. Example: https://www.linde-engineering.com/en/about-linde-engineering/success-stories/ecosourcing-raw-carbon-dioxide.html
Linde also sources a portion of CO2 from ethanol fermentation (a biomass source). In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to capture sales volume to customers from disparate systems. For Scope 2 Emissions: Each business provided the volume of product(s) sold to each customer and the primary supply plant. We used a benchmark conversion factor for energy used in the production per unit of product and then country emission factors (EFs) to determine the CO2e per product. Scope 2 emissions are calculated for product nitrogen, oxygen, argon, and carbon dioxide only.

Requesting member
Robert Bosch GmbH

Scope of emissions
Scope 1

Allocation level
Company wide

Allocation level detail

Emissions in metric tonnes of CO2e
79

Uncertainty (±%)
20

Major sources of emissions
Liquid nitrogen, liquid oxygen, liquid argon, liquid carbon dioxide, hydrogen, and packaged gases. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. CO2 is sourced as a byproduct and purified, then liquefied for transport. Linde has long been a practitioner of what is called "Byproduct Synergy", which is leveraged in our CO2 sourcing. Example: https://www.linde-engineering.com/en/about-linde-engineering/success-stories/ecosourcing-raw-carbon-dioxide.html

Linde also sources a portion of CO2 from ethanol fermentation (a biomass source). In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified
No

Allocation method
Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
This figure represents best effort to allocate distribution kilometers. For Scope 1 emissions: If product was transported by truck, estimated kilometers driven to deliver product, if possible. We assumed a fuel rate of 37.1l per 100 kilometers and converted liters to CO2e using the EIGA conversion rates. NOTE: This conversion factor will over-estimate the CO2e: the product being delivered to a particular customer may be part of a less than a full truckload delivery (i.e., multiple deliveries to several customers from the same truckload of product). It will improve the impact product CO2e per delivery kilometer driven. For package/cylinder gases, allocation of kilometers when there are

multiple products and shipments for multiple customers in an area is a significant challenge. In most cases, these emission allocations are not included.

Requesting member

Robert Bosch GmbH

Scope of emissions

Scope 2

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

4,092

Uncertainty (±%)

20

Major sources of emissions

Liquid nitrogen, liquid oxygen, liquid argon, liquid carbon dioxide, hydrogen, and packaged gases. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. CO2 is sourced as a byproduct and purified, then liquefied for transport. Linde has long been a practitioner of what is called "Byproduct Synergy", which is leveraged in our CO2 sourcing. Example: https://www.linde-engineering.com/en/about-linde-engineering/success-stories/ecosourcing-raw-carbon-dioxide.html

Linde also sources a portion of CO2 from ethanol fermentation (a biomass source). In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to capture sales volume to customers from disparate systems. For Scope 2 Emissions: Each business provided the volume of product(s) sold to each customer and the primary supply plant. We used a benchmark conversion factor for energy used in the production per unit of product and then country emission factors (EFs) to determine the CO2e per product. Scope 2 emissions are calculated for product nitrogen, oxygen, argon, and carbon dioxide only.

Requesting member

Samsung Electronics

Scope of emissions

Scope 1

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

13

Uncertainty (±%)

20

Major sources of emissions

Liquid nitrogen, liquid oxygen, pipeline gaseous nitrogen, pipeline oxygen, pipeline argon, liquid argon, onsite helium, onsite silane, and packaged gases. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to allocate distribution kilometers. For Scope 1 emissions: If product was transported by truck, estimated kilometers driven to deliver product, if possible. We assumed a fuel rate of 37.1l per 100 kilometers and converted liters to CO2e using the EIGA conversion rates. NOTE: This conversion factor will over-estimate the CO2e: the product being delivered to a particular customer may be part of a less than a full truckload delivery (i.e., multiple deliveries to several customers from the same truckload of product). It will improve the impact product CO2e per delivery kilometer driven. For package/cylinder gases, allocation of kilometers when there are multiple products and shipments for multiple customers in an area is a significant challenge. In most cases, these emission allocations are not included.

Requesting member

Samsung Electronics

Scope of emissions

Scope 2

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

506,705

Uncertainty (±%)

20

Major sources of emissions

Liquid nitrogen, liquid oxygen, pipeline gaseous nitrogen, pipeline oxygen, pipeline argon, liquid argon, onsite helium, onsite silane, and packaged gases. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to capture sales volume to customers from disparate systems. For Scope 2 Emissions: Each business provided the volume of product(s) sold to each customer and the primary supply plant. We used a benchmark conversion factor for energy used in the production per unit of product and then country emission factors (EFs) to determine the CO2e per product. Scope 2 emissions are calculated for product nitrogen, oxygen, argon, and carbon dioxide only.

Requesting member

Schlumberger Limited

Scope of emissions

Scope 1

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

51

Uncertainty (±%)

20

Major sources of emissions

Liquid nitrogen, liquid carbon dioxide, and packaged gases. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. CO2 is sourced as a byproduct and purified, then liquefied for transport. Linde has long been a practitioner of what is called "Byproduct Synergy", which is leveraged in our CO2 sourcing. Example: https://www.linde-engineering.com/en/about-linde-engineering/success-stories/ecosourcing-raw-carbon-dioxide.html

Linde also sources a portion of CO2 from ethanol fermentation (a biomass source). In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to allocate distribution kilometers. For Scope 1 emissions: If product was transported by truck, estimated kilometers driven to deliver product, if possible. We assumed a fuel rate of 37.1l per 100 kilometers and converted liters to CO2e using the EIGA conversion rates. NOTE: This conversion factor will over-estimate the CO2e: the product being delivered to a particular customer may be part of a less than a full truckload delivery (i.e., multiple deliveries to several customers from the same truckload of product). It will improve the impact product CO2e per delivery kilometer driven. For package/cylinder gases, allocation of kilometers when there are multiple products and shipments for multiple customers in an area is a significant challenge. In most cases, these emission allocations are not included.

Requesting member

Schlumberger Limited

Scope of emissions

Scope 2

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

1,142

Uncertainty (±%)

20

Major sources of emissions

Liquid nitrogen, liquid carbon dioxide, and packaged gases. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. CO2 is sourced as a byproduct and purified, then liquefied for transport. Linde has long been a practitioner of what is called "Byproduct Synergy", which is leveraged in our CO2 sourcing. Example: https://www.linde-engineering.com/en/about-linde-engineering/success-stories/ecosourcing-raw-carbon-dioxide.html

Linde also sources a portion of CO2 from ethanol fermentation (a biomass source). In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to capture sales volume to customers from disparate systems. For Scope 2 Emissions: Each business provided the volume of product(s) sold to each customer and the primary supply plant. We used a benchmark conversion factor for energy used in the production per unit of product and then country emission factors (EFs) to determine the CO2e per product. Scope 2 emissions are calculated for product nitrogen, oxygen, argon, and carbon dioxide only.

Requesting member

Senior Plc

Scope of emissions

Scope 1

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

6

Uncertainty (±%)

20

Major sources of emissions

Liquid nitrogen, liquid argon, and hydrogen. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to allocate distribution kilometers. For Scope 1 emissions: If product was transported by truck, estimated kilometers driven to deliver product, if possible. We assumed a fuel rate of 37.1l per 100 kilometers and converted liters to CO2e using the EIGA conversion rates. NOTE: This conversion factor will over-estimate the CO2e: the product being delivered to a particular customer may be part of a less than a full truckload delivery (i.e., multiple deliveries to several customers from the same truckload of product). It will improve the impact product CO2e per delivery kilometer driven. For package/cylinder gases, allocation of kilometers when there are multiple products and shipments for multiple customers in an area is a significant challenge. In most cases, these emission allocations are not included.

Requesting member

Senior Plc

Scope of emissions

Scope 2

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

447

Uncertainty (±%)

20

Major sources of emissions

Liquid nitrogen, liquid argon, and hydrogen. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to capture sales volume to customers from disparate systems. For Scope 2 Emissions: Each business provided the volume of product(s) sold to each customer and the primary supply plant. We used a benchmark conversion factor for energy used in the production per unit of product and then country emission factors (EFs) to determine the CO2e per product. Scope 2 emissions are calculated for product nitrogen, oxygen, argon, and carbon dioxide only.

Requesting member

Stanley Black & Decker, Inc.

Scope of emissions

Scope 1

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

1

Uncertainty (±%)

20

Major sources of emissions

Liquid nitrogen - atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to allocate distribution kilometers. For Scope 1 emissions: If product was transported by truck, estimated kilometers driven to deliver product, if possible. We assumed a fuel rate of 37.1l per 100 kilometers and converted liters to CO2e using the EIGA conversion rates. NOTE: This conversion factor will over-estimate the CO2e: the product being delivered to a particular customer may be part of a less than a full truckload delivery (i.e., multiple deliveries to several customers from the same truckload of product). It will improve the impact product CO2e per delivery kilometer driven. For package/cylinder gases, allocation of kilometers when there are multiple products and shipments for multiple customers in an area is a significant challenge. In most cases, these emission allocations are not included.

Requesting member

Stanley Black & Decker, Inc.

Scope of emissions

Scope 2

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

62

Uncertainty (±%)

20

Major sources of emissions

Liquid nitrogen - atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to capture sales volume to customers from disparate systems. For Scope 2 Emissions: Each business provided the volume of product(s) sold to each customer and the primary supply plant. We used a benchmark conversion factor for energy used in the production per unit of product and then country emission factors (EFs) to determine the CO2e per product. Scope 2 emissions are calculated for product nitrogen, oxygen, argon, and carbon dioxide only.

Requesting member

Suzano Papel & Celulose

Scope of emissions

Scope 1

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

55

Uncertainty (±%)

20

Major sources of emissions

Liquid oxygen, pipeline oxygen, liquid carbon dioxide, and packaged gases. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. CO2 is sourced as a byproduct and purified, then liquefied for transport. Linde has long been a practitioner of what is called "Byproduct Synergy", which is leveraged in our CO2 sourcing. Example: https://www.linde-engineering.com/en/about-linde-engineering/success-stories/ecosourcing-raw-carbon-dioxide.html
Linde also sources a portion of CO2 from ethanol fermentation (a biomass source). In

addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to allocate distribution kilometers. For Scope 1 emissions: If product was transported by truck, estimated kilometers driven to deliver product, if possible. We assumed a fuel rate of 37.1l per 100 kilometers and converted liters to CO2e using the EIGA conversion rates. NOTE: This conversion factor will over-estimate the CO2e: the product being delivered to a particular customer may be part of a less than a full truckload delivery (i.e., multiple deliveries to several customers from the same truckload of product). It will improve the impact product CO2e per delivery kilometer driven. For package/cylinder gases, allocation of kilometers when there are multiple products and shipments for multiple customers in an area is a significant challenge. In most cases, these emission allocations are not included.

Requesting member

Suzano Papel & Celulose

Scope of emissions

Scope 2

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

9,034

Uncertainty (±%)

20

Major sources of emissions

Liquid oxygen, pipeline oxygen, liquid carbon dioxide, and packaged gases. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. CO2 is sourced as a byproduct and purified, then liquefied for transport. Linde has long been a practitioner of what is called "Byproduct Synergy", which is leveraged in our CO2 sourcing. Example: https://www.linde-

engineering.com/en/about-linde-engineering/success-stories/ecosourcing-raw-carbon-dioxide.html
Linde also sources a portion of CO2 from ethanol fermentation (a biomass source). In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to capture sales volume to customers from disparate systems. For Scope 2 Emissions: Each business provided the volume of product(s) sold to each customer and the primary supply plant. We used a benchmark conversion factor for energy used in the production per unit of product and then country emission factors (EFs) to determine the CO2e per product. Scope 2 emissions are calculated for product nitrogen, oxygen, argon, and carbon dioxide only.

Requesting member

The Coca-Cola Company

Scope of emissions

Scope 1

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

1,281

Uncertainty (±%)

20

Major sources of emissions

Liquid carbon dioxide, liquid nitrogen, and packaged gases. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. CO2 is sourced as a byproduct and purified, then liquefied for transport. Linde has long been a practitioner of what is called "Byproduct Synergy", which is leveraged in our CO2 sourcing. Example: https://www.linde-engineering.com/en/about-linde-engineering/success-stories/ecosourcing-raw-carbon-dioxide.html

Linde also sources a portion of CO_2 from ethanol fermentation (a biomass source). In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to allocate distribution kilometers. For Scope 1 emissions: If product was transported by truck, estimated kilometers driven to deliver product, if possible. We assumed a fuel rate of 37.1l per 100 kilometers and converted liters to CO_2e using the EIGA conversion rates. NOTE: This conversion factor will over-estimate the CO_2e: the product being delivered to a particular customer may be part of a less than a full truckload delivery (i.e., multiple deliveries to several customers from the same truckload of product). It will improve the impact product CO_2e per delivery kilometer driven. For package/cylinder gases, allocation of kilometers when there are multiple products and shipments for multiple customers in an area is a significant challenge. In most cases, these emission allocations are not included.

Requesting member

The Coca-Cola Company

Scope of emissions

Scope 2

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

27,365

Uncertainty (±%)

20

Major sources of emissions

Liquid carbon dioxide, liquid nitrogen, and packaged gases. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. CO_2 is sourced as a byproduct and purified, then liquefied for transport. Linde has long been a practitioner of what is called "Byproduct Synergy", which is leveraged in our CO_2

sourcing. Example: https://www.linde-engineering.com/en/about-linde-engineering/success-stories/ecosourcing-raw-carbon-dioxide.html
Linde also sources a portion of CO2 from ethanol fermentation (a biomass source). In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to capture sales volume to customers from disparate systems. For Scope 2 Emissions: Each business provided the volume of product(s) sold to each customer and the primary supply plant. We used a benchmark conversion factor for energy used in the production per unit of product and then country emission factors (EFs) to determine the CO2e per product. Scope 2 emissions are calculated for product nitrogen, oxygen, argon, and carbon dioxide only.

Requesting member

The Dow Chemical Company

Scope of emissions

Scope 1

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

104

Uncertainty (±%)

20

Major sources of emissions

Liquid nitrogen, pipeline nitrogen, pipeline oxygen, pipeline hydrogen, liquid hydrogen, liquid carbon dioxide, and packaged gases. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. CO2 is sourced as a byproduct and purified, then liquefied for transport. Linde has long been a practitioner of what is called "Byproduct Synergy", which is leveraged in our CO2 sourcing. Example: https://www.linde-engineering.com/en/about-linde-engineering/success-

stories/ecosourcing-raw-carbon-dioxide.html
Linde also sources a portion of CO2 from ethanol fermentation (a biomass source). In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to allocate distribution kilometers. For Scope 1 emissions: If product was transported by truck, estimated kilometers driven to deliver product, if possible. We assumed a fuel rate of 37.1l per 100 kilometers and converted liters to CO2e using the EIGA conversion rates. NOTE: This conversion factor will over-estimate the CO2e: the product being delivered to a particular customer may be part of a less than a full truckload delivery (i.e., multiple deliveries to several customers from the same truckload of product). It will improve the impact product CO2e per delivery kilometer driven. For package/cylinder gases, allocation of kilometers when there are multiple products and shipments for multiple customers in an area is a significant challenge. In most cases, these emission allocations are not included.

Requesting member

The Dow Chemical Company

Scope of emissions

Scope 2

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

100,456

Uncertainty (±%)

20

Major sources of emissions

Liquid nitrogen, pipeline nitrogen, pipeline oxygen, pipeline hydrogen, liquid hydrogen, liquid carbon dioxide, and packaged gases. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. CO2 is sourced as a

byproduct and purified, then liquefied for transport. Linde has long been a practitioner of what is called "Byproduct Synergy", which is leveraged in our CO2 sourcing. Example: https://www.linde-engineering.com/en/about-linde-engineering/success-stories/ecosourcing-raw-carbon-dioxide.html
Linde also sources a portion of CO2 from ethanol fermentation (a biomass source). In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to capture sales volume to customers from disparate systems. For Scope 2 Emissions: Each business provided the volume of product(s) sold to each customer and the primary supply plant. We used a benchmark conversion factor for energy used in the production per unit of product and then country emission factors (EFs) to determine the CO2e per product. Scope 2 emissions are calculated for product nitrogen, oxygen, argon, and carbon dioxide only.

Requesting member

Vale SA

Scope of emissions

Scope 1

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

1

Uncertainty (±%)

20

Major sources of emissions

Pipeline nitrogen, pipeline oxygen, and packaged gases. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to allocate distribution kilometers. For Scope 1 emissions: If product was transported by truck, estimated kilometers driven to deliver product, if possible. We assumed a fuel rate of 37.1l per 100 kilometers and converted liters to CO2e using the EIGA conversion rates. NOTE: This conversion factor will over-estimate the CO2e: the product being delivered to a particular customer may be part of a less than a full truckload delivery (i.e., multiple deliveries to several customers from the same truckload of product). It will improve the impact product CO2e per delivery kilometer driven. For package/cylinder gases, allocation of kilometers when there are multiple products and shipments for multiple customers in an area is a significant challenge. In most cases, these emission allocations are not included.

Requesting member

Vale SA

Scope of emissions

Scope 2

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

1,224

Uncertainty (±%)

20

Major sources of emissions

Pipeline nitrogen, pipeline oxygen, and packaged gases. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to capture sales volume to customers from disparate systems. For Scope 2 Emissions: Each business provided the volume of product(s) sold to each customer and the primary supply plant. We used a benchmark conversion factor for energy used in the production per unit of product and then country emission factors (EFs) to determine the CO2e per product. Scope 2 emissions are calculated for product nitrogen, oxygen, argon, and carbon dioxide only.

Requesting member

Zimmer Biomet Holdings, Inc.

Scope of emissions

Scope 1

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

2

Uncertainty (±%)

20

Major sources of emissions

Liquid nitrogen, liquid oxygen, liquid argon, and packaged gases. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to allocate distribution kilometers. For Scope 1 emissions: If product was transported by truck, estimated kilometers driven to deliver product, if possible. We assumed a fuel rate of 37.1l per 100 kilometers and converted liters to CO2e using the EIGA conversion rates. NOTE: This conversion factor will over-estimate the CO2e: the product being delivered to a particular customer may be part of a less than a full truckload delivery (i.e., multiple deliveries to several customers from the same truckload of product). It will improve the impact product CO2e per delivery kilometer driven. For package/cylinder gases, allocation of kilometers when there are multiple products and shipments for multiple customers in an area is a significant challenge. In most cases, these emission allocations are not included.

Requesting member

Zimmer Biomet Holdings, Inc.

Scope of emissions

Scope 2

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

40

Uncertainty (±%)

20

Major sources of emissions

Liquid nitrogen, liquid oxygen, liquid argon, and packaged gases. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to capture sales volume to customers from disparate systems. For Scope 2 Emissions: Each business provided the volume of product(s) sold to each customer and the primary supply plant. We used a benchmark conversion factor for energy used in the production per unit of product and then country emission factors (EFs) to determine the CO2e per product. Scope 2 emissions are calculated for product nitrogen, oxygen, argon, and carbon dioxide only.

Requesting member

Caesars Entertainment

Scope of emissions

Scope 2

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

0.01

Uncertainty (±%)

20

Major sources of emissions

Packaged gases - atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to capture sales volume to customers from disparate systems. For Scope 2 Emissions: Each business provided the volume of product(s) sold to each customer and the primary supply plant. We used a benchmark conversion factor for energy used in the production per unit of product and then country emission factors (EFs) to determine the CO2e per product. Scope 2 emissions are calculated for product nitrogen, oxygen, argon, and carbon dioxide only.

Requesting member

Ambev S.A

Scope of emissions

Scope 1

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

211

Uncertainty (±%)

20

Major sources of emissions

Liquid nitrogen, liquid oxygen, and liquid carbon dioxide. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. CO2 is sourced as a byproduct and purified, then liquefied for transport. Linde has long been a practitioner of what is called "Byproduct Synergy", which is leveraged in our CO2 sourcing. Example: https://www.linde-engineering.com/en/about-linde-engineering/success-stories/ecosourcing-raw-carbon-dioxide.html
Linde also sources a portion of CO2 from ethanol fermentation (a biomass source). In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to allocate distribution kilometers. For Scope 1 emissions: If product was transported by truck, estimated kilometers driven to deliver product, if possible. We assumed a fuel rate of 37.1l per 100 kilometers and converted liters to CO2e using the EIGA conversion rates. NOTE: This conversion factor will over-estimate the CO2e: the product being delivered to a particular customer may be part of a less than a full truckload delivery (i.e., multiple deliveries to several customers from the same truckload of product). It will improve the impact product CO2e per delivery kilometer driven. For package/cylinder gases, allocation of kilometers when there are multiple products and shipments for multiple customers in an area is a significant challenge. In most cases, these emission allocations are not included.

Requesting member

Ambev S.A

Scope of emissions

Scope 2

Allocation level

Company wide

Allocation level detail

Emissions in metric tonnes of CO2e

2,075

Uncertainty (±%)

20

Major sources of emissions

Liquid nitrogen, liquid oxygen, and liquid carbon dioxide. Atmospheric products (nitrogen, oxygen, argon) are produced by separating air using energy in cooling towers, then liquefying the gas with further cooling and compression for transportation. CO2 is sourced as a byproduct and purified, then liquefied for transport. Linde has long been a practitioner of what is called "Byproduct Synergy", which is leveraged in our CO2 sourcing. Example: https://www.linde-engineering.com/en/about-linde-engineering/success-stories/ecosourcing-raw-carbon-dioxide.html
Linde also sources a portion of CO2 from ethanol fermentation (a biomass source). In addition to the energy cost of the products, which provides an indirect GHG cost, there is the direct GHG cost of transporting the gases in trucks.

Verified

No

Allocation method

Allocation based on the volume of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

This figure represents best effort to capture sales volume to customers from disparate systems. For Scope 2 Emissions: Each business provided the volume of product(s) sold to each customer and the primary supply plant. We used a benchmark conversion factor for energy used in the production per unit of product and then country emission factors (EFs) to determine the CO2e per product. Scope 2 emissions are calculated for product nitrogen, oxygen, argon, and carbon dioxide only.

SC1.2

(SC1.2) Where published information has been used in completing SC1.1, please provide a reference(s).

European Industrial Gases Association - Doc. 167/20Methodology to Establish a "Product Carbon Footprint": CO_2 emissions from fuel combustion (p. 15)

SC1.3

(SC1.3) What are the challenges in allocating emissions to different customers, and what would help you to overcome these challenges?

Allocation challenges	Please explain what would help you overcome these challenges
Doing so would require we disclose business sensitive/proprietary information	Much of Linde's product "carbon" cost is the energy cost to produce the product, and energy costs per product will always be a sensitive business issue in the Industrial Gas sector. For the purpose of external reporting, emissions are allocated using published industry standard emission factors for production where those factors are available through benchmark studies.

SC1.4

(SC1.4) Do you plan to develop your capabilities to allocate emissions to your customers in the future?

No

SC1.4b

(SC1.4b) Explain why you do not plan to develop capabilities to allocate emissions to your customers.

Our ability to allocate emissions is sufficient to give customers a reasonably accurate representation of the carbon footprint of our product supply. Linde products tend to represent a crucial part of a customer product, but a very small portion of their cost stack.

SC2.1

(SC2.1) Please propose any mutually beneficial climate-related projects you could collaborate on with specific CDP Supply Chain members.

SC2.2

(SC2.2) Have requests or initiatives by CDP Supply Chain members prompted your organization to take organizational-level emissions reduction initiatives?

No

SC4.1

(SC4.1) Are you providing product level data for your organization's goods or services?

Yes, I will provide data

SC4.1a

(SC4.1a) Give the overall percentage of total emissions, for all Scopes, that are covered by these products.

SC4.2a

(SC4.2a) Complete the following table for the goods/services for which you want to provide data.

Name of good/ service

Oxygen

Description of good/ service

Type of product

Final

SKU (Stock Keeping Unit)

Total emissions in kg CO2e per unit

±% change from previous figure supplied

Date of previous figure supplied

Explanation of change

Methods used to estimate lifecycle emissions

Name of good/ service

Hydrogen

Description of good/ service

Type of product

Final

SKU (Stock Keeping Unit)

Total emissions in kg CO2e per unit

±% change from previous figure supplied

Date of previous figure supplied

Explanation of change

Methods used to estimate lifecycle emissions

Name of good/ service
Argon

Description of good/ service

Type of product
Final

SKU (Stock Keeping Unit)

Total emissions in kg CO2e per unit

±% change from previous figure supplied

Date of previous figure supplied

Explanation of change

Methods used to estimate lifecycle emissions

SC4.2b

(SC4.2b) Complete the following table with data for lifecycle stages of your goods and/or services.

SC4.2c

(SC4.2c) Please detail emissions reduction initiatives completed or planned for this product.

Name of good/ service	Initiative ID	Description of initiative	Completed or planned	Emission reductions in kg CO2e per unit
Oxygen for steel making	Initiative 1	White Paper to show energy and CO2e avoided by the use of oxygen from Linde in steelmaking. Impact of Blast Furnace 02 Enrichment. https://www.linde.com/-/media/linde/merger/documents/sustainable-development/praxair-white-paper-impact-of-blast-oxygen-enrichment-w-disclaimer-r1.pdf?la=en&rev=f2427b7aafa74546b55f72cf5548789d	Completed	
Oxygen	Initiative 2	Linde's proprietary CONOx system is a practical, low capital cost technology for refiners searching for a way to reduce emissions. Reference: http://www.praxair.com/industries/refining/fluid-catalytic-cracker-fcc-emissions-reduction	Completed	
Hydrogen in ultra-low sulfur diesel (ULSD) fuel production	Initiative 3	Hydrogen is provided to refiners to allow them to meet air quality regulations and to hydrotreat diesel fuel to make ultra-low sulfur diesel (ULSD) fuel. This can be burned without emitting sulfur dioxide. Hydrogen provides an additional benefit to ULSD, which is that in combination with a now mandated diesel particulate filter, it eliminates black carbon (BC). Reduction in BC is seen by policy-makers as being a crucial step to delay global temperature increase. Linde's White Papers with more ULSD information can be found on Linde's Climate Change website under "Less Carbon, More Clean": https://www.linde.com/about-linde/sustainable-development/climate-change	Completed	
Oxygen in glass production	Initiative 4	Linde's OPTIMELT Thermochemical Regenerator system stores waste energy from the hot flue gas in regenerator checkers and subsequently utilizes this heat to preheat fuel. The result is the conversion of fuel to hot syngas – which means you'll need 20% to 30% less fuel to melt your glass, compared to oxy-fuel and air regenerative glass furnaces. It also enables a reduction in GHG emmissions due to increased efficiency. https://www.youtube.com/watch?v=XTp3ymxIYe8	Completed	
Oxygen, Nitroge	Initiative 5	Production emissions reduction: ongoing research and developments leading to reduction in power to produce atmospheric gases as well as investments in decarbonization projects and renewable power.	Ongoing	

n, Argon		Reference Linde Sustainable Development targets and performance: https://www.linde.com/about-linde/sustainable-development/targets-and-performance		
Hydrogen	Initiative 6	Production emissions reduction: ongoing research and developments leading to improvements in production energy efficiencies. Reference Linde Sustainable Development targets and performance: https://www.linde.com/en/about-linde/sustainable-development/targets-and-performance	Ongoing	
Bulk and packaged gases	Initiative 7	Distribution emissions reduction: ongoing research and developments leading to improvements in distribution efficiencies. Reference Linde Sustainable Development targets and performance: https://www.linde.com/about-linde/sustainable-development/targets-and-performance	Ongoing	
Onsite, merchant and packaged gases	Initiative 8	Renewable energy: ongoing effort to source a portion of energy used in gas production from renewable sources. Reference Linde Sustainable Development targets and performance: https://www.linde.com/about-linde/sustainable-development/targets-and-performance	Ongoing	
Carbon dioxide for enhanced curing of concrete blocks	Initiative 9	Carbon dioxide provided by Linde for Carboclave's enhanced curing of concrete blocks enables a reduction in GHG emissions by permanently sequestering CO2 in concrete as well as process efficiency improvements resulting in less fuel consumption and less cement production required. Reference our external partner, Carboclave's video: https://www.youtube.com/watch?v=uog2ir6n7TU	Ongoing	
High purity Fluorine in the manufacture of semiconductors, flat panel displays and thin film solar panels		Linde Electronics has pioneered the use of molecular fluorine (F2) as a replacement for high GWP fluorinated cleaning gases, such as NF3 and SF6, which are currently used to clean CVD chambers in the manufacture of semiconductors, flat panel displays and thin film solar panels. High purity Fluorine gas is the highest performance cleaning gas available, improving productivity on CVD tools, reducing energy consumption and environmental impact, with ZERO Global Warming Potential. Reference Generation-F On-Site Fluorine Generators: https://www.linde-gas.com/en/products_and_supply/electronic_gases_and_chemicals/on_site_gas_generation/generation_f_on_site_fluorine_generation/index.html	Completed	

SC4.2d

(SC4.2d) Have any of the initiatives described in SC4.2c been driven by requesting CDP Supply Chain members?

No

Submit your response

In which language are you submitting your response?

English

Please confirm how your response should be handled by CDP

	I am submitting to	Public or Non-Public Submission	Are you ready to submit the additional Supply Chain questions?
I am submitting my response	Investors Customers	Public	Yes, I will submit the Supply Chain questions now

Please confirm below

I have read and accept the applicable Terms