

## Linde plc: CDP Climate Change Questionnaire 2020

### 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 plc was formed in 2017 in accordance with the requirements of the business combination agreement, dated June 1, 2017, as amended, between Linde plc, Praxair, Inc. ("Praxair") and Linde Aktiengesellschaft ("Linde AG"). Effective October 31, 2018, the business combination was completed, and Linde plc is comprised of the businesses of Praxair and Linde AG (hereinafter, the combined group will be referred to as "the company" or "Linde" and the legacy companies will be referred to as "Linde AG" and "Praxair").

Linde is a leading global industrial gases and engineering company with 2019 sales of USD 28 billion. The company employs approximately 80,000 people globally and serves customers in 95 countries worldwide.

Linde is a major technological innovator in the industrial gases industry. Approximately 83 percent of Linde's 2019 sales were generated from industrial gases operations in three geographic segments – Americas; Europe, Middle East and Africa [EMEA]; and Asia Pacific [APAC]. The remaining 17 percent is related primarily to the Engineering segment, and to a lesser extent, other operating segments (including the business of Praxair Surface Technologies, Inc. a wholly owned subsidiary).

Linde's primary products in its industrial gases business are atmospheric gases (oxygen, nitrogen, argon, and rare gases) and process gases (carbon dioxide, helium, hydrogen, electronic gases, specialty gases, and acetylene). The company also designs, engineers, and builds equipment that produces industrial gases for internal use as well as for 3rd party customers, and offers 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 process plants. The surface technologies segment supplies wear-resistant and high-temperature corrosion-resistant metallic and ceramic coatings and powders.

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

2019 marks the first year of combined full-year reporting of financial and non-financial information for the new merged enterprise. The merger and consolidation of information from the two legacy companies meant that there are several changes in reporting standards and reporting boundaries. During 2019, after the lifting of the "hold separate order" in March, Linde started to work on the definition of its new non-financial reporting standards, boundaries, policies, strategies and ultimately its new 10-year sustainable development targets. The latter were completed end 2019 and approved by the Linde Board of Directors in early 2020. This new information is presented in Linde's 2019 Sustainable Development Report (SDR) (published in July 2020) and forms also the basis for Linde's 2020 CDP response.

In last year's CDP response, Linde provided mostly Praxair-only information, as Praxair operations accounted for 80 percent of Linde's reported revenues for 2018. This also included methodologies, standards, policies and targets valid solely for the legacy company.

The difference in scope and boundaries for Linde between 2018 and 2019 reporting makes it difficult to compare performance between 2018 and 2019 and does not allow for trends to be determined. Linde has therefore decided to restate the reported 2018 non-financial KPIs, especially in the area of environment and climate change, in order to provide a meaningful basis of comparison between the two years. The restatement means that Linde has calculated a pro forma 2018 number, which is based on a full year of operation of the combined company reflecting the same organizational structure, reporting boundaries and methodologies as defined in 2019 for the current company.

Whenever Linde is now in this CDP report referring to 2018 or comparing 2019 against 2018 data, it refers to the re-stated 2018 full year pro forma value. This will be described in each question/section where this is relevant.

## 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, 2019	December 31, 2019	Yes	1 year

## C0.3

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

Algeria	Greece	Russian Federation
Argentina	Hungary	Serbia
Australia	Iceland	Singapore
Austria	India	South Africa
Bahrain	Ireland	Spain
Bangladesh	Italy	Sweden
Belgium	Japan	Switzerland
Bolivia (Plurinational State of)	Luxembourg	Taiwan, Greater China
Brazil	Malaysia	Thailand
Canada	Mexico	Tunisia
Chile	Netherlands	Turkey
China	New Zealand	Ukraine
Colombia	Norway	United Arab Emirates
Costa Rica	Panama	United Kingdom of Great Britain and Northern Ireland
Czechia	Paraguay	Ireland
Denmark	Peru	United States of America
Dominican Republic	Philippines	Uruguay
Ecuador	Poland	Zambia
Finland	Portugal	Zimbabwe
France	Puerto Rico	
Germany	Republic of Korea	
	Romania	

## 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

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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
Director on board	<p>Linde's full Board of Directors has responsibility to review safety and environmental risk at each Board meeting. 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. Environmental issues are managed by the head of global SHEQ, reporting to the SVP of Linde's Global Functions.</p> <p>Linde's full Board reviews sustainability issues and Linde's performance against its SD 2028 targets, at least annually. It reviewed sustainability (including climate change) twice in 2019. In early 2020, the full Board approved Linde's new 10-year Sustainable Development (SD 2028) Targets, which include several climate change targets.</p> <p>In addition, the Board Nomination &amp; Governance Committee has responsibility to periodically review the company's guidelines and policies governing its response to important issues in the area of corporate social responsibility, which includes climate change and water-related issues. Its Audit Committee reviews the guidelines and policies by which Linde undertakes enterprise risk assessment and risk management, including risks related to climate change.</p>

## 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 – all meetings	<p>Reviewing and guiding strategy</p> <p>Reviewing and guiding major plans of action</p> <p>Reviewing and guiding risk management policies</p> <p>Monitoring implementation and performance of objectives</p> <p>Monitoring and overseeing progress against goals and targets for addressing climate-related issues</p>	<p>Sustainable Development is overseen by the Board and Linde's executive leadership and integrated throughout the company.</p> <p>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.</p> <p>Its Audit Committee reviews the guidelines and policies by which Linde undertakes enterprise risk assessment and risk management.</p> <p>The Board has responsibility to review environmental risk at each meeting, including risks from climate change. Issues related to climate change are a topic at each Board meeting.</p> <p>In 2019, the full Board requested several presentations on issues directly related to sustainability and climate change.</p>

		<p>The CSO reported to the full Board in mid-2019 on matters related to climate change, and a presentation was made on Linde’s Technology and Decarbonization strategy.</p> <p>During 2019, Linde developed its new 10-year Sustainable Development targets (which include several climate change targets) at the request of the Board. In January 2020, the Linde Board approved Linde’s 10-year SD Targets. Linde's SVP briefs the Board, as does Linde's Chief Sustainability Officer, on Linde's performance against the company's 2028 sustainable development targets. Performance against those targets will be reviewed at least annually by the full Board of Directors.</p> <p>In addition, the Board reviews safety and risk matters at each meeting, these may include climate change issues such as the impacts of extreme weather such as flooding and hurricanes.</p> <p>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 2020 proxy statement.</p>
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## 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 Senior Vice President (SVP) 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 SVP is equivalent to what CDP calls the chief operating officer.

**What responsibilities for climate change have been assigned to this position:** Linde's SVP is responsible for R&D; Global Market Development; the Center of Excellence; Procurement; Digitalization; Sustainable Development; Safety, Health, Environment and Quality (SHEQ); Praxair Surface Technologies; Global Helium and Rare Gases; and Electronic Materials. The SVP is the position with ultimate responsibility for climate change because climate change, like other sustainable development issues, are integral to Linde's operations. The SVP has oversight over all key aspects of operations.

**Specific responsibilities of SVP with regard to assessment and management of climate-related issues:** Under the SVP'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 Chief Sustainability Officer (CSO) monitors climate-related issues, including by regularly tracking and reporting to the SVP 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 Center 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 2019 Annual Report 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 incentivized	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 2020 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 2019 variable compensation pay-outs included receiving recognition on the DJSI World Index and consistently being listed on various ESG investment indices.
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## 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.

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### 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 annual report (10K) which cover, among others, risks from energy sourcing and from natural catastrophes due to extreme weather events.

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 2019 Q2 risk update, about 15 specific risks related to physical impact from climate change have been 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 and 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 (\$100 million) 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. As a result, decisions on proposed risk mitigation actions have been taken/confirmed which 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 a risk mitigation action is to establish specific flood level standards and 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 analysed 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 management 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 the 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 and 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 plc's 2019 Annual Report 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 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. Violations of these laws could result in substantial penalties or sanctions. Therefore, Linde assesses risks associated with both current and emerging regulations.
Emerging regulation	Relevant, always included	Linde plc's 2019 Annual Report 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	<p>Linde plc's 2019 Annual Report 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&amp;D 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.</p>
Legal	Relevant, always included	<p>Linde plc's 2019 Annual Report 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.</p> <p>We consider 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.</p>
Market	Relevant, always included	<p>Markets for sourcing raw materials and energy: Linde plc's 2019 Annual Report identifies the cost and availability of raw materials and energy as a risk in Section 1A Risk Factors. 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.</p> <p>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 by-products. 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.</p> <p>Change in customer demand: Linde plc's 2019 Annual Report 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. This also includes the risk of changing customer behaviour towards a higher demand for low-carbon products and services. 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&amp;D and changing customer behaviour</p>

		(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.
Reputation	Relevant, always included	<p>Linde plc's 2019 Annual Report 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.</p> <p>Linde constantly assesses risks related to both R&amp;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-user environmental or social benefit.</p> <p>We continuously monitor evolving attitudes toward climate-related issues and the associated expectations that may impact how Linde's actions and products are viewed.</p>
Acute physical	Relevant, always included	<p>Linde plc's 2019 Annual Report 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.</p> <p>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.</p>
Chronic physical	Relevant, always included	<p>Linde's 2019 Annual Report 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.</p> <p>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.</p>

## 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.

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### 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, Mexico and parts of Asia. China has announced plans to launch a national carbon emissions trading system, though it does not appear the regulations will have a direct impact on GHG emissions from Linde facilities. 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. 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.

Company specific example/details: In 2019, 9% (close to 1.5 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 2019 varied between \$21 and \$31. 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)

37,500,000

### 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 short term (next 1-2 years), based on an evaluation by Linde's procurement organization, the risk of carbon legislation should be similar to previous year (e.g. same countries, same taxation types and cost level).

In order to calculate the financial impact from this risk, Linde assumes in the short term an average carbon tax/fee of \$25 per ton of CO<sub>2</sub> and an amount of 1.5 million tons of emissions to be covered (similar to the amount in 2019). This takes into consideration constant improvements in GHG intensity (see 2028 climate change targets) and the latest outlook on carbon legislation.

\$25 times 1.5 million tons of emissions = \$37.5 million of potential carbon-related fees for Linde.

### 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; 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.

Additionally, Linde focuses on operational productivity and energy efficiency and has corporate energy and GHG targets to minimize the impact of volatility in energy costs and to manage the risks of an uncertain regulatory environment.

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: Following the merger of Praxair and Linde AG to form Linde plc, the company 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 (scope 1+2 over EBITDA) via several levers, which reduces the exposure to carbon-limiting regulations and resulting on-cost for Linde and its customers. In 2019, Linde made progress against this target: GHG intensity was reduced 8% compared to 2018.

## Comment

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### 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

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 events could impact Linde's customers and suppliers resulting in temporary or long-term outages and/or the limitation of supply of energy or other raw materials used in normal business operations. Such extreme events, depending on their severity, 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, Europe and certain portions of Asia.

In the past, Linde hasn't been significantly impacted by high severity events. We currently consider the probability of these events to be low, but in the future, the probability may rise.

The impact of such major events can be between medium to high as 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 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, windstorm and flooding. The insurer uses rigorous standards based on their own scientific research and proven solutions 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 anticipated climate change.

The company currently procures risk transfer insurance from highly rated insurance companies for any catastrophic claims in excess of \$5M in total property damage around the globe. 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 damage to one of our large plants in Texas, mainly due to flooding. To mitigate damage from flooding and high winds, we worked with our insurance providers and our plant engineering team to come up with new resilient design standards. Some of Linde's newest plants are now built to withstand winds of 118 mph and critical equipment is raised to specific flood level standards.

## Comment

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### 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 substitute conventional fossil-fuel based technologies. Linde already offers several applications which help its customers reduce their GHG emissions. This includes 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 as a key technology/product on the way to a low carbon economy.

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 cannot 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 recently signed an MOU with China Power to develop green hydrogen energy in China. If Linde is not able to secure the right customers/collaboration partners, this could have an adverse impact on growing this new business area.

### 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)

1,000,000,000

### 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.

### Cost of response to risk

66,000,000

### Description of response and explanation of cost calculation

Linde is at the forefront of innovation for new technologies like carbon capture and storage or hydrogen applications. Linde was a founding member of the Hydrogen Council and takes part in other relevant H2 initiatives and pilot projects. In addition, Linde has formed a new hydrogen organization and defined climate change targets including R&D and investments for innovation, which includes hydrogen applications.

#### Explanation of cost calculation:

Linde has set – among its new 2028 Sustainability Targets – 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 innovation area. Linde invested \$66 million in 2019 in low-carbon projects (see also 2019 performance versus targets) and is on track to achieve \$1 billion in investments cumulatively by 2028.

Case study: Green hydrogen is seen as a key enabler of the low carbon economy. Today, Linde operates more than 80 electrolysis plants worldwide. In order to fulfil the growing demand for green hydrogen, Linde is looking to create additional green hydrogen capacity to deliver a higher volume of green hydrogen. To accomplish this, Linde among others 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, whose aim is to develop large-scale green hydrogen solutions on a cost comparative base with current standard technologies. The joint venture will create capacity to deliver a higher volume of projects, shorten lead times, improve execution and reduce costs.

### Comment

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#### Identifier

Risk 4

#### Where in the value chain does the risk driver occur?

Upstream

#### Risk type & Primary climate-related risk driver

Market

Increased cost of raw materials

## 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. 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 e.g. 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

Unlikely

## 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.

## 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 Linde's US plants. These spikes can lead to higher energy prices for these plants. Linde is mitigating this risk by e.g. 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.

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#### 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 materials (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 carbon capture; 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.

Company specific examples of how Linde is already increasing revenue from increased demand for green H2: 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 Hydrosponder 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.

### 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 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

1,000,000,000

### 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: Hydrogen is seen as one key enabler of the low-carbon transition. 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 joint venture will create capacity to deliver a higher volume of projects, shorten lead times, improve execution and reduce costs

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. In 2019, the investment in decarbonization projects was \$66 million of which investments in Linde's hydrogen strategy was a large portion.

### 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 100 million MT of CO<sub>2</sub>e annually – that's more than twice as much GHG avoided than emitted from all our operations.

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### 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.

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 an estimated 290 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 ( $\$70 \text{ million} \times 5.08\% = \$4,060,000$ , 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 CO<sub>2</sub> for lime softening in drinking water treatment. In 2020, Linde is expecting a long-term supply agreement for CO<sub>2</sub> 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, 2018-2028. In 2019, our sustainability portfolio was 53% of revenue or \$13.5 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 2019 (\$184 million) went to develop the applications and processes described in this section.

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## 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, 2018-2028. In 2019, our sustainability portfolio was 53% of revenue or \$13.5 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)

140,000,000

### 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. If Linde's top line grows 1% per year then this equates to about \$140 million of growth in revenue per year from Linde's sustainability portfolio.

### Cost to realize opportunity

46,000,000

### 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.

Case Study: Linde has a target that its sustainability portfolio - applications that bring customers sustainability benefits - should exceed 50% of annual revenue. 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 us ensure we are able to meet increasing customer demand for low carbon products. Linde needs to continuously seek ways to increase the sustainability portfolio. One way is through R&D. 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. In 2019, Linde's sustainability portfolio was 53% of revenue, or \$13.5 billion, and 25% of the 2019 R&D budget was on decarbonization efforts. This focus on environmental innovation is yielding positive market results.

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 25% of the total R&D expenditure in 2019 (\$184 million) went to develop the applications and processes described in this section (25% of \$184 million = \$46 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) Does your organization use climate-related scenario analysis to inform its strategy?

Yes, qualitative and quantitative

### C3.1b

(C3.1b) Provide details of your organization's use of climate-related scenario analysis.

Climate-related scenarios and models applied	Details

<p>IEA B2DS</p>	<p>Linde is aligned with the Paris Accord and as such, decided that the B2DS was the most appropriate to inform its business strategy. In 2019, Linde developed its 2028 climate change targets. As part of the target setting process, the company calculated a potential GHG emission pathway to 2050 (considered time horizon), using assumptions from the IEA B2DS, along with industry specific growth projections for our major product segments (e.g. hydrogen growth projection from the hydrogen council). Our analysis shows that Linde’s targets and mid- to long-term GHG projections are in line with the GHG pathway for the chemical industry as reflected in the IEA B2DS.</p> <p>Areas of the organization considered: Our scenario analysis included industrial gases operations, it did not look at scenarios for engineering business or healthcare which have a very small CO2 footprint.</p> <p>Results of the scenario analysis: Linde looked at several future scenarios which are relevant to its sector and concluded that the B2DS should be selected as it supports the goals of the Paris agreement and outlines a specific pathway for the chemical industry to 2060. Linde further considered the assumptions of that scenario to be valid.</p> <p>The B2DS assumes net zero emissions of the energy sector by 2060 and is based on a “technology push” scenario, this means it explores how far deployment of technologies that are already available or in the innovation pipeline could take us, without requiring unforeseen technology breakthroughs or limiting economic growth. Linde has set itself a target to double its amount of low-carbon electricity sourced by 2028. This target is partly driven by the decarbonization of the energy sector itself and an increasing share of low carbon energy within the overall energy mix. Linde believes that with the right political and governmental push a decarbonization of the energy sector as outlined in the B2DS can be achieved.</p> <p>Linde is a leader in new, low-carbon technologies including CCUS or clean hydrogen applications and continuously invests in process efficiency and innovation. Process electrification is thereby seen as an important lever for carbon reduction (e.g. hydrogen over electrolysis as opposed to SRM process). This, together with a fast decarbonization of the energy sector, should enable a strong decrease in CO2 emitted to the atmosphere by mid-century and should put Linde on an emission reduction pathway in line with the overall chemical industry pathway stipulated by the B2DS. As outlined in the B2DS description, Linde believes that achieving the B2DS will require changes in societal behaviors, government regulation and industry engagement. Above all, a strong policy push and governmental support is required (e.g. subsidies) to make the transformation into a low-carbon world possible.</p> <p>How results of the analysis have informed Linde’s business strategy: Linde is aligned with the Paris agreement and therefore aspires to align its business strategy and management decisions with the GHG pathway as outlined in B2DS. The result of the scenario analysis impacted the definition of Linde's 10-year managed climate change targets. Linde has set itself rigorous efficiency targets, and targets for dedicated expenses in R&amp;D and investments in decarbonization projects till 2028 and will continue to focus on such developments up till 2050 and beyond.</p> <p>Case Study: Looking at its GHG development and scenario alignment, Linde wanted to implement measures to better track the impact of business decisions on its GHG footprint. It has therefore decided to implement climate related KPIs into each new investment decision at top management level. Furthermore, Linde has implemented a shadow carbon price to inform investment decisions. The result of those measures is a better ability to</p>
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	steer the company towards the aspired GHG pathway, with greater awareness of the risks and opportunities of each new investment project and business decision.
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### C3.1d

(C3.1d) 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	<p>Linde is a technology leader and at the forefront of innovation in many technology areas, including low-carbon products and services.</p> <p>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. E.g., 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 2019, 53% of Linde’s sales revenues were realized from that product portfolio.</p> <p>In addition, Linde has set targets to invest in R&amp;D related to low-carbon products and applications and to invest &gt;\$1 billion by 2028 in low carbon projects.</p> <p>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.</p>
Supply chain and/or value chain	Yes	<p>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”.</p> <p>From a value chain perspective, Linde needs to respond to changes in customer behavior and offer products and services which help</p>



		<p>customers to become more successful and productive.</p> <p>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 maintain its focus on such offerings in the short, mid and long term. E.g., 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 2019, 53% of Linde’s sales revenues were realized from that product portfolio.</p> <p>In addition, Linde has set targets to invest in R&amp;D related to low-carbon products and applications and to invest &gt;\$1 billion by 2028 in low carbon projects.</p> <p>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 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.</p>
Investment in R&D	Yes	<p>Linde is a technology leader and at the forefront of innovation in many technology areas, including in low-carbon products and services.</p> <p>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 &gt;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.</p>

		<p>In addition, Linde has set targets to invest more than one third of annual R&amp;D expenditures in low-carbon projects and initiatives by 2028, and to invest &gt;\$1 billion by 2028 in low carbon projects.</p> <p>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&amp;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.</p>
Operations	Yes	<p>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.</p> <p>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.</p> <p>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. E.g. 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 2019, Linde made progress against each of these targets. E.g., ASU efficiency improved 0.6%, HYCO 3.4%.</p> <p>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 2019, low carbon electricity procured increased from 15.2 to 15.5 TWh. As a result, Linde expects</p>

		its emission intensity to further decrease (already decreased by 8% in 2019) and therefore a decreased risk from emission regulations.
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### C3.1e

(C3.1e) 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	<p>Revenues</p> <p>Direct costs</p> <p>Indirect costs</p> <p>Capital expenditures</p>	<p>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.</p> <p>Linde has a target to realize at least 50% of annual revenues from its sustainability portfolio through 2028, including low carbon products and services. This is considered in the annual business plan (revenue).</p> <p>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 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.</p> <p>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).</p> <p>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.</p> <p>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&amp;D. Linde has a target that by 2028, &gt;30% of its annual R&amp;D expenses will be directed to new technologies and especially low-carbon applications. The amount of R&amp;D expenses required in those areas is planned</p>

		<p>every year as part of the annual R&amp;D budget.</p> <p>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&amp;D budget towards low carbon projects by 2028. In 2019 Linde spent 25% of its total annual R&amp;D budget (\$184 million) on decarbonization topics. The R&amp;D expenses for low-carbon developments/innovations were factored in as part of the annual budgeting process into Linde’s annual budget.</p> <p>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&amp;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.</p> <p>Case Study: Linde has set a target to invest &gt;\$1 billion into low carbon projects by 2028 and is on track to achieve this target. As an example, Linde recently has undertaken a strategic investment in ITM power, a British manufacturer of polymer electrolyte membrane (PEM) electrolyzers, and formed the Joint Venture ITM Linde Electrolysis, exploring the large-scale application of (green) hydrogen production over electrolysis. In 2019, Linde in total invested \$66 million in decarbonization projects/initiatives. The CAPEX required for such projects/initiatives are factored into the overall annual CAPEX planning/budget of the company.</p>
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### C3.1f

**(C3.1f) 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 CO<sub>2</sub>e per EBITDA in billion USD

Base year

2018

Intensity figure in base year (metric tons CO<sub>2</sub>e per unit of activity)

5

% 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 CO<sub>2</sub>e per unit of activity) [auto-calculated]

3.25

% change anticipated in absolute Scope 1+2 emissions

17

% change anticipated in absolute Scope 3 emissions

0

Intensity figure in reporting year (metric tons CO<sub>2</sub>e per unit of activity)

4.6

% of target achieved [auto-calculated]

22.8571428571

Target status in reporting year

New

Is this a science-based target?

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

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 full year 2018 pro forma baseline. 2018 pro forma numbers were verified by external auditors. They are based on the same reporting standards, methodologies and boundaries as were defined during 2019 for the new Linde company.

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 2019 adjusted pro forma EBITDA was \$8.2 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). In contrast, we expect our scope 2 emissions to stay flat or decline despite a substantial increase of power usage over the coming years, mainly due to our increase in low carbon energy. However, the development of absolute emissions in the coming years will heavily depend on economic/market growth in our industry and other external parameters which Linde cannot influence. It is therefore not possible to anticipate how our scope 1 and 2 emissions will develop in the long term.

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 2019 Sustainable Development Report.

## 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**

15,500,000

**% of target achieved [auto-calculated]**

1.9736840807

**Target status in reporting year**



New

### 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 e.g., 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 2019, Linde sourced 15.5 TWh low-carbon energy, or 35 percent of all its purchased electricity. Of this, Linde actively sourced 2.4 TWh of renewable energy. 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 CO<sub>2</sub>e

**Target denominator (intensity targets only)**

**Base year**

2018

**Figure or percentage in base year**

1.7

**Target year**

2028

**Figure or percentage in target year**

1.5

**Figure or percentage in reporting year**

1.7

**% of target achieved [auto-calculated]**

0

**Target status in reporting year**

New

**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 CO<sub>2</sub> emitted, including methane emissions. Other GHG emissions within this target are from refrigerant losses from cylinder refilling operations; nitrous oxide (N<sub>2</sub>O) emissions from N<sub>2</sub>O plants and cylinder filling; and methane releases from helium and CO<sub>2</sub> plants, which account for most of Linde's other GHG emissions. The target is to reduce these absolute emissions by 10% by 2028.

During 2019, sources of emissions in scope and reduction options were assessed. The 2019 emissions were flat against the 2018 baseline.

---

**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**

25

**% of target achieved [auto-calculated]**

20

**Target status in reporting year**

New

**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 25 percent of its 2019 R&D budget (\$184 million) into decarbonization (2018: 23 percent). Initiatives include developing industry-leading carbon capture technologies, investing in promising green hydrogen technologies, and driving operational efficiency to further reduce GHG intensity.

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**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**

66,000,000

**% of target achieved [auto-calculated]**

6.6

**Target status in reporting year**

New

**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 \$66 million, of which the largest was the stake in the joint venture ITM Linde Electrolysis GmbH.

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**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**

2019

**Figure or percentage in base year**

2

**Target year**

2019

**Figure or percentage in target year**

2.7

**Figure or percentage in reporting year**

2.7

**% 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 our 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 2.7. This is the value which was actually achieved in 2019. The target was therefore 100% achieved.

In 2019, our emissions were 37,473,000 MT, meaning our target was to enable at least 74,946,000 MT to be avoided by customers. ( $37,473,000 \text{ MT CO}_2\text{e} * 2 = 74,946,000 \text{ MT CO}_2\text{e}$ ). In fact, Linde avoided 100,000,000 MT in 2019 which is 2.7 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 8% of gases sales in 2019.

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	
To be implemented*	86	10,000
Implementation commenced*	248	76,000
Implemented*	1,461	505,000
Not to be implemented	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)

312,435

Scope(s)

Scope 1

Scope 2 (market-based)

Voluntary/Mandatory



Voluntary

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

52,305,000

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

23,000,000

**Payback period**

1-3 years

**Estimated lifetime of the initiative**

Ongoing

**Comment**

917 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.

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**Initiative category & Initiative type**

Transportation

Company fleet vehicle efficiency

**Estimated annual CO2e savings (metric tonnes CO2e)**

30,208

**Scope(s)**

Scope 1

**Voluntary/Mandatory**

Voluntary

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

25,890,000

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

11,500,000

**Payback period**

1-3 years

**Estimated lifetime of the initiative**

Ongoing

**Comment**

693 voluntary projects provided permanent reduction in diesel and gasoline use and corresponding GHG emissions from fuel efficiency or route efficiency programs, on-site tank size optimization, trailer size optimization and track engine modifications to maximize fuel economy.

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**Initiative category & Initiative type**

Energy efficiency in buildings

Lighting

**Estimated annual CO2e savings (metric tonnes CO2e)**

5,536

**Scope(s)**

Scope 2 (market-based)

**Voluntary/Mandatory**

Voluntary

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

90,000

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

250,000

**Payback period**

4-10 years

**Estimated lifetime of the initiative**

Ongoing

**Comment**

13 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)**

5,877

**Scope(s)**

Scope 1

Scope 2 (market-based)

**Voluntary/Mandatory**

Voluntary

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

1,539,000

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

650,000

**Payback period**

4-10 years

**Estimated lifetime of the initiative**

Ongoing

**Comment**

30 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.

---

**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)**

150,774

**Scope(s)**

Scope 1

**Voluntary/Mandatory**

Voluntary

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

4,765,000

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

2,000,000

**Payback period**

1-3 years

**Estimated lifetime of the initiative**

Ongoing

**Comment**

56 projects reduced product CO2 and ODS emissions through reducing transfers, process efficiency, system integrity and refrigerant replacements

## C4.3c

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

Method	Comment
Financial optimization calculations	<p>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.</p> <p>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.</p> <p>In 2019, energy and GHG efficiency projects resulted in savings of more than \$85 million, 440 million kwh and 505,000 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.</p>

## 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 (O<sub>2</sub>) 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 2019 this led to 100 million MT CO<sub>2</sub>e avoided which is 2.7 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 more than 100 million metric tons of their Scope 1+2 CO<sub>2</sub>e in 2019. This includes 14.8 million MT avoided by the use of oxygen in steel making, 57.1 million MT avoided by the use of hydrogen in ultra-low sulfur diesel, 20.3 million MT avoided from the use of specialty coatings to make thermal barriers for industrial gas turbine and jet engine energy efficiency, and 7.8 million MT avoided from Krypton in windows and Argon in welding. End-user avoided CO<sub>2</sub> 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>.

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### 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

**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. In 2019 GHG efficiency in the hyco area improved by 3.4%, 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 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. The base year figure provided here is a pro forma figure for the full year of 2018 for the new merged organization (final organizational structure after merger, excluding divestitures), which is different from previously reported 2018 figures. 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. It is therefore the right base of comparison for future years for the combined organization and its new SD targets.

## Scope 2 (location-based)

---

### Base year start

January 1, 2018

### Base year end

December 31, 2018

### Base year emissions (metric tons CO<sub>2</sub>e)

## 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 CO<sub>2</sub>e)

21,093,000

## 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. The base year figure provided here is a pro forma figure for the full year of 2018 for the new merged organization (final organizational structure after merger, excluding divestitures), which is different from previously reported 2018 figures. The 2018 pro forma figure has been externally verified. It follows the same reporting standards, methodologies and boundaries as were defined for the new Linde organization in 2019. It is therefore the right base of comparison for future years for the combined organization and its new SD targets.

## 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.**

During 2019, Linde defined harmonized reporting standards and methodologies for the collection and reporting of its environmental key performance indicators (eKPIs). Linde's new 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.

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 Praxair 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 CO<sub>2</sub>e?

Reporting year

---

Gross global Scope 1 emissions (metric tons CO<sub>2</sub>e)

16,461,000

Start date

January 1, 2019

End date

December 31, 2019

Comment

During 2019, Linde defined harmonized reporting standards and methodologies for the collection and reporting of its environmental key performance indicators (eKPIs). Linde's new 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.

The primary source of scope 1 emissions for Linde is the combustion of natural gas at hydrogen plants, which represented 11.1 million tons of scope 1 emissions in 2019. Another portion is from ASU plants using natural gas for energy generation, which amounted to 2.1 million tons CO<sub>2</sub>e. Smaller sources of scope 1 emissions are other greenhouse gases from e.g. methane plants or nitrous oxide plants or other types of GHG emissions which are converted into CO<sub>2</sub> equivalents. The total of such "other GHG emissions" was 1.7 million tons in 2019. CO<sub>2</sub> and

other plants caused about 0.9 million tons. The combustion of diesel and gasoline from transport activities resulted in about 0.7 million tons CO<sub>2</sub>e in 2019.

#### Past year 1

---

##### Gross global Scope 1 emissions (metric tons CO<sub>2</sub>e)

16,872,000

##### Start date

January 1, 2018

##### End date

December 31, 2018

##### Comment

For ease of comparison and to follow Linde's performance year on year, Linde is restating its previously reported 2018 Scope 1 and 2 emissions data. These 2018 pro forma values are comparable to the 2019 numbers, using the same reporting scope, definition, and boundaries. 2018 pro forma Scope 1 and 2 numbers have been audited.

## 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

During 2019, Linde defined harmonized reporting standards and methodologies for the collection and reporting of its environmental key performance indicators (eKPIs). Linde's new 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: 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 known, Linde uses the most recent location-based factors from the IEA and EPA's eGRID factors for the U.S.

Linde also calculated Scope 2 emissions for 2019 using the location-based approach, which applies IEA factors and eGRID emission factors in the U.S. Scope 2 emissions calculated with the location-based approach were 19.9 million Metric Tons CO<sub>2</sub>e in 2019. 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.

## C6.3

### (C6.3) What were your organization's gross global Scope 2 emissions in metric tons CO<sub>2</sub>e?

#### Reporting year

---

##### Scope 2, location-based

19,900,000

##### Scope 2, market-based (if applicable)

21,012,000

##### Start date

January 1, 2019

##### End date

December 31, 2019

##### Comment

During 2019, Linde defined harmonized reporting standards and methodologies for the collection and reporting of its environmental key performance indicators (eKPIs). Linde's new 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: 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.

Linde also calculated Scope 2 emissions for 2019 using the location-based approach, which applies IEA factors and eGRID emission factors in the U.S. Scope 2 emissions calculated with the location-based approach were 19.9 million Metric Tons CO<sub>2</sub>e in 2019. 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.

## Past year 1

---

### Scope 2, location-based

### Scope 2, market-based (if applicable)

21,093,000

### Start date

January 1, 2018

### End date

December 31, 2018

### Comment

The market-based scope 2 value disclosed here is a pro forma value, calculated for the full business year of 2018 and the complete merged company. It is comparable to the 2019 value in terms of reporting standards, methodologies and boundaries. 2018 pro forma market-based Scope 2 emissions have been audited.

Linde did not back-calculate a location-based pro forma scope 2 number for 2018.

During 2019, Linde defined harmonized reporting standards and methodologies for the collection and reporting of its environmental key performance indicators (eKPIs). Linde's new 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: 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.

## C6.4

(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. Linde e.g. 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 CO<sub>2</sub>e

1,540,000

#### 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

#### Please explain

### Capital goods

---

#### Evaluation status

Relevant, calculated

#### Metric tonnes CO<sub>2</sub>e

965,000

### Emissions calculation methodology

With the merger, Linde now comprises of a large engineering business, therefore the total scope 3 from capital goods purchased has gained in significance. Indirect emissions caused by capital goods acquired by the company is now Linde's fourth largest type of scope 3 emissions. 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.

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

Please explain

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

---

#### Evaluation status

Relevant, calculated

#### Metric tonnes CO2e

5,299,000

### 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

Please explain

#### 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, does not need any transportation, but is 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 CO<sub>2</sub> 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

Not relevant, calculated

Metric tonnes CO<sub>2</sub>e

27,300

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. As these emissions are small compared to other scope 3 sources, and data collection and analysis for more than 80,000 employees worldwide is complex, Linde does not consider these emissions relevant. 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.

### 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

577,000

## 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

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### 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 CO<sub>2</sub>e

2,280,000

### Emissions calculation methodology

This category includes emissions for assets like smaller on-site facilities where the customer is paying for the power and in many cases operating the plant. This also includes a couple of major plants where customers are paying the power and where Linde is 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 such smaller on-site plants operated by the customer all over the world. This category of scope 3 emissions therefore currently represents the third largest source of scope 3 emissions.

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

Please explain

#### Franchises

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##### Evaluation status

Not relevant, explanation provided

Please explain

Linde does not own franchises.

#### Investments

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##### Evaluation status

Relevant, calculated

##### Metric tonnes CO<sub>2</sub>e

3,060,000

##### Emissions calculation methodology

Per Linde's newly defined environmental and GHG reporting standards, 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. As the new Linde has large JV operations, especially in China, with the merger this category has gained in significance and currently represents the second largest source of scope 3 emissions for Linde.

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.

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

100

Please explain

All JVs report their energy usage into Linde's eKPI reporting system. Linde calculated GHG emissions by using this data and applying emissions factors.

Other (upstream)

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Evaluation status

Please explain

Other (downstream)

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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 CO<sub>2</sub>e per unit currency total revenue and provide any additional intensity metrics that are appropriate to your business operations.

---

Intensity figure

0.00133

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO<sub>2</sub>e)

37,473,000

Metric denominator

unit total revenue

**Metric denominator: Unit total**

28,228,000,000

**Scope 2 figure used**

Market-based

**% change from previous year**

1.5

**Direction of change**

Decreased

**Reason for change**

Total sales revenues were stable from 2018 (pro-forma) to 2019 (increase of 0.5%), however absolute scope 1 and 2 emissions dropped by 492,000 tons (1.3% 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**

0.0046

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

37,473,000

**Metric denominator**

Other, please specify

EBITDA

**Metric denominator: Unit total**

8,178,000,000

**Scope 2 figure used**

Market-based

**% change from previous year**

8.2

**Direction of change**

Decreased

**Reason for change**

The improvement is due to two factors: EBITDA improved by 7.6% from 2018 to 2019 and absolute scope 1 and 2 emissions decreased by 492,000 tons (1.3% 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.

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	14,761,000	IPCC Fourth Assessment Report (AR4 - 100 year)
Other, please specify  Other greenhouse gases emitted directly such as N2O, CH4, HCFCs, etc.	1,700,000	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	9,970,000
Europe, Middle East and Africa (EMEA)	2,935,000
Asia, Australasia	2,228,000
Other, please specify	1,328,000



Engineering, Global operations and other scope 1 emissions not reported by region	
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## 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)	1,886,000
Hydrogen Production	11,149,000
CO2 Plants	735,000
Trucking	703,000
Speciality Gases operations	1,485,000
Other Global operations	503,000

## 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	15,132,000	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-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)	Purchased and consumed electricity, heat, steam or cooling (MWh)	Purchased and consumed low-carbon electricity, heat, steam or cooling accounted for in Scope 2 market-based approach (MWh)
Americas	6,288,000	6,105,000	16,739,000	512,000
Europe, Middle East and Africa (EMEA)	4,647,000	5,748,000	12,458,000	1,740,000
Asia, Australasia	8,756,000	8,995,000	14,478,000	179,000
Other, please specify	209,000	164,000	442,000	0

Other global operations				
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## 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)	18,067,000	19,219,000
Hydrogen Production	842,000	826,000
All other operations	991,000	967,000

## 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	19,692,000	20,848,000	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

		<p>reported here as 100% of reported scope 3 from purchased goods and services).</p> <p>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.</p>
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## C-CH7.8a

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

	Sales, metric tons	Comment
Carbon dioxide (CO2)		Linde does not provide a value in the "sales" column because we considers this information business confidential.
Methane (CH4)		Linde does not provide a value in the "sales" column because we considers this information business confidential.
Nitrous oxide (N2O)		Linde does not provide a value in the "sales" column because we considers this information business confidential.
Hydrofluorocarbons (HFC)		Linde does not provide a value in the "sales" column because we considers this information business confidential.
Perfluorocarbons (PFC)		Linde does not provide a value in the "sales" column because we considers this information business confidential.
Sulphur hexafluoride (SF6)		Linde does not provide a value in the "sales" column because we considers this information business confidential.
Nitrogen trifluoride (NF3)		Linde does not provide a value in the "sales" column because we considers this information 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	150,000	Decreased	0.4	<p>The percentage is calculated by 150,000 (scope 2 savings from increased low carbon sourcing), divided by 37,965,000 (scope 1 and 2 combined number for 2018).</p> <p><math>150,000/37,965,000*100=0.4\%</math>.</p> <p>Low carbon (zero fossil) electricity sourced has</p>

				increased in 2019 from 15.2 TWH to 15.5 TWH. This means an addition of 0.3 TWH replacing conventional electricity sourced in several parts of the world. Linde's average emissions factor of energy sourced is 0.5 tons of CO2 per 1 MWh. A reduction of 300,000 MWh of conventional electricity therefore means a saving of 150,000 tons of scope 2 emissions.
Other emissions reduction activities	505,000	Decreased	1.3	The percentage is calculated by 505,000 divided by 37,965,000 (scope 1 and 2 combined number for 2018). $505,000/37,965,000 * 100 = 1.3\%$ . This refers to several activities counted within our sustainable productivity 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	163,000	Increased	0.4	This is calculated by dividing 163,000 by 37,965,000 (scope 1 and 2 combined number for 2018). $163,000/37,965,000 * 100 = 0.4\%$ . The change is due to a general volume increase of 2% as well as shifts in outputs between different groups of products with different product carbon footprint.
Change in methodology				
Change in boundary				
Change in physical operating conditions				
Unidentified				
Other				

## 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)	0	21,246,000	21,246,000
Consumption of purchased or acquired electricity		2,431,000	39,448,000	41,879,000
Consumption of purchased or acquired steam		0	2,238,000	2,238,000
Total energy consumption		2,431,000	53,999,000	65,363,000

### 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)	18,348,000

Consumption of purchased or acquired electricity	41,447,000
Consumption of purchased or acquired steam	2,228,000
Total energy consumption	62,023,000

## 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

17,172,000

### MWh fuel consumed for self-generation of heat

8,356,000

### MWh fuel consumed for self-generation of steam

1,144,000

### MWh fuel consumed for self-cogeneration or self-trigeneration

7,672,000

**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**

2,637,000

**MWh fuel consumed for self-generation of heat**

2,637,000

**MWh fuel consumed for self-generation of steam**

**MWh fuel consumed for self-cogeneration or self-trigeneration**

**Emission factor**

2.69

**Unit**

kg CO2e per liter

**Emissions factor source**

U.S. EPA AP 42

**Comment**

---

**Fuels (excluding feedstocks)**

Fuel Oil Number 1

**Heating value**

LHV (lower heating value)

**Total fuel MWh consumed by the organization**

103,000

**MWh fuel consumed for self-generation of heat**

103,000

**MWh fuel consumed for self-generation of steam**

**MWh fuel consumed for self-cogeneration or self-trigeneration**

**Emission factor**

0.28436

**Unit**

kg CO2e per kWh

**Emissions factor source**

Defra

**Comment**

---

**Fuels (excluding feedstocks)**

Naphtha

**Heating value**

LHV (lower heating value)

**Total fuel MWh consumed by the organization**



432,000

**MWh fuel consumed for self-generation of heat**

432,000

**MWh fuel consumed for self-generation of steam**

**MWh fuel consumed for self-cogeneration or self-trigeneration**

**Emission factor**

0.2483

**Unit**

kg CO2e per KWh

**Emissions factor source**

Defra

**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**

902,000

**MWh fuel consumed for self-generation of heat**

902,000

**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**

examples: refinery off gases and methanol

## 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/region of consumption of low-carbon electricity, heat, steam or cooling**

Latin America (LATAM)

**MWh consumed accounted for at a zero-emission factor**

229,000

**Comment**

PPAs in Mexico, Brazil, Ecuador and Colombia

---

### 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/region of consumption of low-carbon electricity, heat, steam or cooling

Philippines

### MWh consumed accounted for at a zero-emission factor

92,000

### Comment

---

### 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

Solar

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

India

### MWh consumed accounted for at a zero emission factor

86,000

### Comment

---

### Sourcing method

Unbundled energy attribute certificates, Renewable Energy Certificates (RECs)

### Low-carbon technology type

Low-carbon energy mix

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

Germany

**MWh consumed accounted for at a zero-emission factor**

5,000

**Comment**

80% Hydro 20% Wind

---

**Sourcing method**

Unbundled energy attribute certificates, Renewable Energy Certificates (RECs)

**Low-carbon technology type**

Hydropower

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

Sweden

**MWh consumed accounted for at a zero-emission factor**

14,000

**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

70% wind, 14% Hydro

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

Southern Europe

**MWh consumed accounted for at a zero-emission factor**

128,000

**Comment**

Wind 70%, Hydro 14%, Solar 7%, Biomass 9%

---

**Sourcing method**

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

**Low-carbon technology type**

Wind

**Country/region 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**

1,508,000

**Comment**

---

**Sourcing method**

Green electricity products (e.g. green tariffs) from an energy supplier, not supported by energy attribute certificates

**Low-carbon technology type**

Hydropower

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

United States of America

**MWh consumed accounted for at a zero-emission factor**

283,000

**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/region of consumption of low-carbon electricity, heat, steam or cooling**

Ireland

**MWh consumed accounted for at a zero-emission factor**

85,000

**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**

184,000

**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**

185

**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

258

### Total consumption unit

thousand metric tons

### Inherent carbon dioxide emission factor of feedstock, metric tons CO<sub>2</sub> 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 CO<sub>2</sub> to beverage makers for carbonation).

---

### Fuels used as feedstocks

Other, please specify

Range of fuels and customer waste gases



**Total consumption**

17,000

**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.

---

## Description

Other, please specify

Water withdrawal

## Metric value

612.4

## Metric numerator

million cubic meters of water withdrawn

## Metric denominator (intensity metric only)

n/a

## % change from previous year

6

## Direction of change

Decreased

## Please explain

Water is an important resource and input to Linde's production processes, especially in the air separation (ASU) business. Although water issues are not considered a significant risk for Linde in the short and mid-term, Linde acknowledges the fact that this resource could in the future be affected by climate change (e.g. due to increasing mean temperature).

Water scarcity - if considerably increasing in the future - could pose a risk to Linde. Linde is therefore constantly looking for ways to reduce its water consumption (especially consumption of fresh water) through R&D and innovation and is tracking water withdrawal and usage in detail on a site level as well as water stress levels at the locations where Linde operates. Linde has defined a target to implement water management plans at 100% of sites exceeding a certain level of water withdrawal and located in an area exposed to high or very high water stress, as defined by the World Resource Institute (Water Risk Atlas).

In 2019, Linde reduced its water withdrawal by 6%.

Linkage between water and increased energy efficiency, decreased energy use and decreased GHG emissions:

Cooling water systems are an integral part of Linde's production operations and are primarily used to remove heat of compression from our process streams. Cooling systems and heat exchange equipment are energy and water-consuming assets, so our focus on energy efficiency improvement projects leads to benefits in reducing both energy and water use.

Policy or action:

Linde seeks to maximize energy and water efficiency at all sites. The linkages described above show that some projects have multiple benefits - they reduce energy and GHG emissions while also reducing water use. Linde continues to pursue projects that address multiple environmental impacts. These linkages are managed through a tableau dashboard developed to monitor sites using large amounts of water that are located in areas of high-water stress. The dashboard evaluates the linkage between efforts to improve energy efficiency and reduce water use.

## C-CH9.3a

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

### Output product

Specialty chemicals

### Production (metric tons)

### Capacity (metric tons)

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

### Electricity intensity (MWh per metric ton of product)

### Steam intensity (MWh per metric ton of product)

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

### 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-T09.6/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-T09.6/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 about 100

	metric tons of CO2 equivalents each year, this is 2.7 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 2019, Linde invested 25% of its total annual R&D budget (184 million USD) in low carbon product and service developments.
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## 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%	46,000,000	<p>Linde plc started to measure this number/percentage for the new merged company starting in 2018, the year of the merger, based on the company’s new organizational boundaries. The average % provided here is therefore over 2 years (starting with the merger year). The % of R&amp;D for low-carbon products and services in 2019 was 25%, in 2018 it was 23%. Linde plans to achieve a 33% share of annual R&amp;D related to decarbonization topics by 2028.</p> <p>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&amp;D activities as part of total R&amp;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&amp;D process. For example: Linde is continuously working on improving its operational processes and plant design to make it more energy and GHG efficient. There is e.g. 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</p>

				<p>doing research to continuously improve applications and make those more efficient. E.g. for carbon capture and utilization, Linde has among others successfully installed a CCU plant in Al Jubail/Saudi Arabia which saves about 0.5 million tons CO2 per year. Other CCUS areas like post combustion capture are still in pilot stages or small-scale deployment. E.g. Linde ran a pilot plant for RWE in Germany for several years.</p>
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## 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

 [Lindeplc\\_eKPI Assurance Statement CVS\\_2019.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**

 [Lindeplc\\_eKPI Assurance Statement CVS 2019.pdf](#)

**Page/ section reference**

1-2

**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

 [Lindeplc\\_eKPI Assurance Statement\\_CVS\\_2019.pdf](#)

### Page/section reference

1-2

### Relevant standard

ISO14064-3

### Proportion of reported emissions verified (%)

4.2



## 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?

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

 [Lindeplc\\_eKPI Assurance Statement CVS 2019.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, 2019

Period end date

December 31, 2019

Allowances allocated

0

Allowances purchased

0

Verified Scope 1 emissions in metric tons CO<sub>2</sub>e

81,048

Verified Scope 2 emissions in metric tons CO<sub>2</sub>e

0

## Details of ownership

Facilities we own and operate

## Comment

There are zeros in the "allowances allocated" and "allowances purchased" fields because 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, 2019

**Period end date**

December 31, 2019

**Allowances allocated**

885,144

**Allowances purchased**

399,251

**Verified Scope 1 emissions in metric tons CO<sub>2</sub>e**

1,284,396

**Verified Scope 2 emissions in metric tons CO<sub>2</sub>e**

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**

0.7

**Period start date**

January 1, 2019

**Period end date**

December 31, 2019

**Allowances allocated**

131,000

**Allowances purchased**

8,779

**Verified Scope 1 emissions in metric tons CO<sub>2</sub>e**

0

**Verified Scope 2 emissions in metric tons CO<sub>2</sub>e**

139,779

**Details of ownership**

Facilities we own and operate

**Comment**

### Shanghai pilot ETS

---

**% of Scope 1 emissions covered by the ETS**

0

**% of Scope 2 emissions covered by the ETS**

0.5

**Period start date**

January 1, 2019

**Period end date**

December 31, 2019

**Allowances allocated**

93,000

**Allowances purchased**

3,000

**Verified Scope 1 emissions in metric tons CO<sub>2</sub>e**

0

**Verified Scope 2 emissions in metric tons CO<sub>2</sub>e**

96,000

**Details of ownership**

Facilities we own and operate

**Comment**

## 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, 2019

**Period end date**

December 31, 2019

**% of total Scope 1 emissions covered by tax**

0.7

**Total cost of tax paid**

500,000

**Comment**

Cost of tax per ton of scope 1 emissions was 5 Singapore dollars in 2019.

## 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 CO<sub>2</sub>/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 CO<sub>2</sub> allowances it has to procure to make up that shortfall, Linde has a target to improve GHG efficiency at all its H<sub>2</sub> plants by 4% by 2028; in the EU, this has reduced Linde's average CO<sub>2</sub> 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 2019, Linde's H<sub>2</sub> plants achieved a 3.4% 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 (Scope 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)

#### % 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 39% 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

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#### 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

#### 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 CO<sub>2</sub> emitted and water used per cylinder sold to Linde. Based on annual sales to Linde, these combined savings were >500MT CO<sub>2</sub>e and >300,000 M<sup>3</sup> 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

### 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 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 53% of Linde's revenue in 2019. A subset of this portfolio helped customers avoid 100 million metric tons of CO<sub>2</sub>e emissions in 2019.

### 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. 2019 was the first year that Linde is reporting these metrics for the full organization. Last year, due to the timing of the merger of Linde AG and Praxair, we only reported on Praxair's portion.

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 57.1 million metric tons of CO<sub>2</sub>e in 2019. In all, the use of 5 of Linde's applications enabled 100 million metric tons of CO<sub>2</sub>e to be avoided, which is 2.7 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 53% of Linde's revenue in 2019, or \$13.5 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 met with the U.S. Congress and state and local officials, including in California, to discuss clean energy generation for fuel cell technologies.	Linde supports the promotion of public policies that encourage the use of hydrogen fuel cells as zero-emission sources of energy.
Energy efficiency	Support	Linde met with the U.S. Congress and state and local officials to discuss energy efficiency.	Linde supports continued federal and state funding for fossil fuel energy efficiency technology development.

### C12.3b

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

No

## 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. 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 VP & Chief Sustainability Officer and General Counsel to ensure consistency of public policy advocacy with Linde's global sustainability strategy, including our energy and GHG strategy. The VP & Chief Sustainability Officer 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).

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### Publication

In mainstream reports

### Status

Complete

### Attach the document

 [2019-ifrs.pdf](#)

### Page/Section reference

pages 136-138

### Content elements

Governance

Risks & opportunities

Other, please specify

Information on products that offer environmental benefit and help customers reduce their carbon footprint

### Comment

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### Publication

In voluntary sustainability report

### Status

Complete

### Attach the document

 [Linde plc 2019-sustainable-development-report.pdf](#)

### Page/Section reference

16-23, 55-67

### Content elements

Governance

Strategy

Risks & opportunities

Emissions figures

Emission targets

Other metrics

### Comment

This attached is the first sustainability report of the new combined Linde enterprise after the merger. It presents Linde's sustainability governance and strategy, its new 10-year Sustainable

Development targets 2018-2028 along with its specific Climate Change targets. Furthermore, Linde's view and engagement about climate change is described for the short, medium and long-term. The report further presents disclosures about various environmental KPIs tracked by Linde, including energy and emissions KPIs, and emissions figures.

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## Publication

In voluntary communications

## Status

Complete

## Attach the document

 [linde-plc\\_2019\\_2020-tcf-index.pdf](#)

## Page/Section reference

1-4

## Content elements

Governance

Strategy

Risks & opportunities

Emissions figures

Emission targets

## Comment

Linde TCFD Index 2019-2020: Linde's Alignment with the Recommendations of the Task Force on Climate-related Financial Disclosures: Using the disclosure recommendations from the Task Force on Climate-related Financial Disclosures (TCFD), this index references Linde's public disclosures on climate change, which can be found on Linde's web site, in Linde's Sustainable Development Report, in its Annual Report (10K), the 2020 Notice of General Meeting, and the Proxy Statement, all which were issued in 2020 and contain information and data from calendar year 2019; plus Linde's 2018 climate change CDP response, which was issued in 2019 and contains 2018 data. An updated index will be issued in September 2020 with CDP 2019 responses, and then annually.

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## Publication

In other regulatory filings

### Status

### Attach the document

 [Linde 2020 Proxy Statement\\_FIN.pdf](#)

### Page/Section reference

9, 47-48, 50

### Content elements

Governance

Emission targets

Other, please specify

Incentives awarded in variable compensation for performance in environmental responsibility and sustainability

### Comment

The Linde Notice of 2020 Annual General Meeting of Shareholders and Proxy Statement contains information on governance, in particular, the Board's role in risk oversight; and on Linde's performance against its non-financial goals, including climate change targets.

## 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		