

C0. Introduction

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C0.1

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

Air Products' higher purpose is to bring people together to collaborate and innovate solutions that benefit the environment, enhance sustainability, and address the challenges facing customers, communities, and the world. We offer a unique portfolio of products, services, and solutions that include atmospheric gases, process and specialty gases, equipment, and related services. Focused on serving energy, environmental, and emerging markets, we serve customers in dozens of industries, including refining, chemicals, metals, electronics, manufacturing, medical, and food. Our gases, equipment, and applications expertise enable our customers to improve their sustainability performance by increasing productivity, producing better quality products, reducing energy use, and lowering emissions. We are also the global leader in the supply of liquefied natural gas process technology and equipment. We also develop, engineer, build, own and operate some of the world's largest industrial gas and carbon-capture projects, supplying clean hydrogen that will support global transportation, industrial markets, and the broader energy transition away from fossil fuels. We have built leading positions in several growth markets, such as hydrogen, helium, and liquefied natural gas process technology and equipment, and provide turbomachinery, membrane systems, and cryogenic containers globally.

Air Products growth and sustainability strategy are one and the same, and we have announced over \$15 billion in projects that support cleaner energy and a cleaner environment.

We supply our customers around the world with atmospheric gases, such as oxygen, nitrogen, and argon; process gases, such as hydrogen, helium, carbon dioxide, carbon dioxide (CO<sub>2</sub>), carbon monoxide, and syngas (a mixture of hydrogen and carbon monoxide); and specialty gases. Our industrial gases business also develops, builds, and operates equipment for the production or processing of gases, such as air separation units and non-cryogenic generators. These products also enable our customers and their customers to avoid greenhouse gas emissions. In 2022, 86 million metric tons of CO<sub>2</sub>e\* were avoided by the use of our products, approximately equivalent to the emissions from about 19 million cars and more than three times our own total direct and indirect CO<sub>2</sub>e emissions.

In addition to supporting our customers, we are committed to improving our environmental performance by operating safely and efficiently, incorporating environmental considerations into the design of our facilities and products, effectively managing environmental risks and communicating our results. Industrial gas manufacturing is energy intensive. Air separation requires electricity or steam to compress air so that it can be cryogenically distilled into oxygen, nitrogen and argon. Likewise, the primary method to produce large volumes of hydrogen consumes natural gas, and in some cases, refinery off-gas. Most of our Scope 1 emissions are related to the energy that we consume, which is primarily our hydrogen and carbon monoxide units, while our Scope 2 emissions are largely due to the electricity and steam we consume in our air separation units. Our Scope 3 emissions are related to upstream fuel and energy related activities, use of sold products and investments.

For over 80 years, Air Products has enabled its customers to become more productive, energy efficient and sustainable. With fiscal 2022 revenues of \$12.7 billion, operations in more than 50 countries, and more than 21,000 employees, we strive to build lasting relationships with our customers and communities based on understanding, integrity and passion. Our corporate headquarters are located in Allentown, Pennsylvania; European headquarters are in Hersham, near London, England; South American headquarters are in Santiago, Chile; and Asian headquarters are in Shanghai, China.

This is Air Products' 21st consecutive response to CDP's climate change information request. Our emissions reporting period is January 1, 2022 to December 31, 2022.

\*CO<sub>2</sub>e or carbon dioxide equivalent is a standard unit for measuring carbon footprints that considers the different global warming potentials of GHGs.

C0.2

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**(C0.2) State the start and end date of the year for which you are reporting data and indicate whether you will be providing emissions data for past reporting years.**

**Reporting year**

**Start date**

January 1 2022

**End date**

December 31 2022

**Indicate if you are providing emissions data for past reporting years**

No

**Select the number of past reporting years you will be providing Scope 1 emissions data for**

<Not Applicable>

**Select the number of past reporting years you will be providing Scope 2 emissions data for**

<Not Applicable>

**Select the number of past reporting years you will be providing Scope 3 emissions data for**

<Not Applicable>

**C0.3**

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**(C0.3) Select the countries/areas in which you operate.**

Argentina  
Bahrain  
Belgium  
Brazil  
Canada  
Chile  
China  
Colombia  
Ecuador  
Egypt  
France  
Germany  
Indonesia  
Israel  
Malaysia  
Netherlands  
Oman  
Peru  
Poland  
Republic of Korea  
Saudi Arabia  
Singapore  
Spain  
Taiwan, China  
United Kingdom of Great Britain and Northern Ireland  
United States of America

**C0.4**

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

USD

**C0.5**

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**(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**

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

**Row 1**

**Bulk organic chemicals**

**Bulk inorganic chemicals**

- Hydrogen
- Oxygen
- Other industrial gasses

**Other chemicals**

**C0.8**

**(C0.8) Does your organization have an ISIN code or another unique identifier (e.g., Ticker, CUSIP, etc.)?**

Indicate whether you are able to provide a unique identifier for your organization	Provide your unique identifier
Yes, an ISIN code	US 0091581068

**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 or committee	Responsibilities for climate-related issues
Board-level committee	<p>Air Products manages sustainability through an interdisciplinary approach. Our Board of Directors has accountability for oversight of environmental and safety performance, which it reviews at least quarterly. The Corporate Governance and Nominating Committee of the Board has responsibility for monitoring our response to important public policy issues, including sustainability, which the Committee reviews on a regular basis. The Company's Enterprise Risk Management (ERM) Committee determines which risks are most significant, supports the implementation of action plans to address risks, and reports at least annually to the Board of Directors. Air Products' Chairman, President and CEO has leadership responsibility for the development and execution of the company's sustainability strategy.</p> <p>Three examples of climate-related decisions led by the CEO and under the oversight of the Board of Directors in 2022 were Air Products' multi-billion dollar investments in zero and low-carbon hydrogen energy. The first project is a green hydrogen production facility in Casa Grande, Arizona, U.S. The zero-carbon liquid hydrogen facility's product will be sold to the hydrogen mobility market in California and other locations requiring zero-carbon hydrogen. Air Products also announced plans for a second hydrogen liquefaction plant in Rotterdam, The Netherlands, that will double Europe's current liquid hydrogen capacity. Liquid hydrogen produced at the plant will be used to supply increasing demands from high-tech industries as well as the mobility market. The plant will contribute to the decarbonization of heavy-duty vehicles and aid Europe on its goal of climate neutrality by 2050. In addition, the Company announced plans to invest \$500 million to build, own and operate a green liquid hydrogen facility in Massena, New York, U.S. To support this clean energy project, low-carbon hydroelectric power will be used at the facility. The zero-carbon liquid hydrogen product from the facility is expected to be sold to the mobility market in New York State as well as potential northeast industrial markets.</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	Scope of board-level oversight	Please explain
Scheduled – all meetings	<p>Reviewing and guiding annual budgets</p> <p>Overseeing major capital expenditures</p> <p>Overseeing acquisitions, mergers, and divestitures</p> <p>Reviewing and guiding strategy</p> <p>Overseeing the setting of corporate targets</p> <p>Monitoring progress towards corporate targets</p> <p>Overseeing and guiding public policy engagement</p> <p>Overseeing value chain engagement</p> <p>Reviewing and guiding the risk management process</p>	<Not Applicable>	<p>Risk assessment and management is overseen by the Board of Directors. The Company's Enterprise Risk Management (ERM) Committee determines which risks are most significant, supports the implementation of action plans to address risks, and reports at least annually to the Board of Directors. Climate-related risks and opportunities have been reviewed by and reflect the Board's input.</p> <p>The Corporate Governance and Nominating Committee reviews progress against the company's Sustainability Goals on an annual basis. In 2020, and with the Board's support, we announced our "Third by 30" goal to reduce our CO2 emissions intensity one-third by 2030 from a 2015 baseline. In 2022, the Company announced new goals, also supported by the Board, including Net Zero by 2050, a Scope 3 intensity reduction goal and an industry-leading capital commitment to accelerating the energy transition with more than \$15 billion in capex to be either spent or committed between 2018 and 2027 to energy transition projects.</p> <p>The Board is also engaged in discussions about company activities that could potentially impact sustainability, such as major capital projects including investments hydrogen energy announced in 2022, such as a green hydrogen production and liquefaction facility in Casa Grande, Arizona, a second hydrogen liquefaction plant in Rotterdam, The Netherlands, and a green hydrogen project in Massena, New York, using hydroelectric power.</p>

**C1.1d**

**(C1.1d) Does your organization have at least one board member with competence on climate-related issues?**

	Board member(s) have competence on climate-related issues	Criteria used to assess competence of board member(s) on climate-related issues	Primary reason for no board-level competence on climate-related issues	Explain why your organization does not have at least one board member with competence on climate-related issues and any plans to address board-level competence in the future
Row 1	Yes	Air Products' Board possesses a broad range of qualifications and skills that facilitate strong oversight of the company's management and strategy that are applicable to climate change. Criteria related to competency on climate-related issues include leadership experience at major domestic and international companies; experience on other companies' boards, which provides an understanding of different business processes, challenges, strategies and approaches to problem-solving; and substantial experience in key aspects of our operations, finance and capital management and government relations as well as in the market sectors we serve, including the energy, electronics and chemicals industries. Director qualification and skills are noted in our Proxy Statement for 2023 (page 9).	<Not Applicable>	<Not Applicable>

**C1.2**

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

**Position or committee**

Chief Executive Officer (CEO)

**Climate-related responsibilities of this position**

Managing annual budgets for climate mitigation activities  
Managing major capital and/or operational expenditures related to low-carbon products or services (including R&D)  
Managing climate-related acquisitions, mergers, and divestitures  
Integrating climate-related issues into the strategy  
Setting climate-related corporate targets  
Monitoring progress against climate-related corporate targets  
Managing public policy engagement that may impact the climate  
Managing value chain engagement on climate-related issues  
Assessing climate-related risks and opportunities  
Managing climate-related risks and opportunities

**Coverage of responsibilities**

<Not Applicable>

**Reporting line**

Reports to the board directly

**Frequency of reporting to the board on climate-related issues via this reporting line**

More frequently than quarterly

**Please explain**

Climate change and related issues are reviewed by the following levels of the organizational structure that are described below in more detail:

- The Board of Directors
- The Corporate Governance and Nominating Committee of the Board of Directors
- Air Products' Chairman, President and Chief Executive Officer
- The Sustainability Leadership Council, which is chaired by the Vice President of Sustainability
- The Enterprise Risk Management Committee, which is sponsored by the Chief Operating Officer
- Regional businesses and environmental experts
- The Sustainability Team

Air Products' Board of Directors has accountability for oversight of environmental and safety performance, which it reviews at least quarterly. Risk assessment and management is overseen by the Board of Directors, with information reported annually from the Enterprise Risk Management Committee. Climate-related risks and opportunities are routinely reviewed and reflect the Board's input. The Corporate Governance and Nominating Committee of the Board of Directors has responsibility for monitoring our response to important public policy issues, including sustainability, which the Committee reviews on a regular basis. The Sustainability Leadership Council sets our sustainability strategy, reviews programs and performance, and is engaged in evaluating risks and opportunities related to climate change. The Council is chaired by the Vice President Sustainability, who reports to the company's Chief Operating Officer. Additional members of the Council include:

- Chief Operating Officer
- Executive Vice President, General Counsel and Secretary
- Senior Vice President and Chief Financial Officer
- Senior Vice President and Chief Human Resources Officer
- President, Americas
- President, Asia
- Senior Vice President and Chief Human Resources Officer
- President, Europe and Africa
- Vice President, Corporate Communications
- Vice President, Hydrogen for Mobility
- Executive Director, Technology
- Executive Director, Operational Excellence
- Director, Sustainability

The Sustainability Leadership Council Chairman and Sustainability Director report on sustainability progress to the Corporate Governance and Nominating Committee at least annually.

Air Products' Enterprise Risk Management (ERM) Committee determines which risks are most significant, supports the implementation of action plans to address risks, and reports at least annually to the Board of Directors.

Regional environmental experts identify and review risks (transitional and physical) related to climate change and communicate risks to potentially impacted businesses.

The Sustainability Team, comprised of the Sustainability Director and staff, supports all aspects of sustainability including climate change and reports to the Vice President of Sustainability.

This structure enables the communication and review of climate related risks and opportunities through management and across the Company.

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**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	Air Products' Management Development and Compensation Committee has discretion to apply an ESG modifier to adjust the Annual Incentive Plan upward or downward for performance against our environmental, social and governance objectives and our safety objectives. The ESG modifier reflects the Committee's consideration of the executive officers' role in advancing the Company's safety, culture and diversity and environmental performance. The ESG modifier is "universal", meaning that the same payout adjustment is applied consistently for all executive officers. This can result in up to a 20% reduction or increase to the payout that would otherwise be earned based on our adjusted EPS performance. For Fiscal 2022, the Committee applied an ESG modifier of 1.1. The 1.1 ESG modifier reflects the executive officers' role in advancing the Company's environmental performance along with the continued progress the Company has made towards its diversity and safety culture objectives.

**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**

Chief Executive Officer (CEO)

**Type of incentive**

Monetary reward

**Incentive(s)**

Bonus - % of salary

**Performance indicator(s)**

Progress towards a climate-related target

Reduction in emissions intensity

**Incentive plan(s) this incentive is linked to**

Both Short-Term and Long-Term Incentive Plan

**Further details of incentive(s)**

Air Products' Management Development and Compensation Committee has discretion to apply an ESG modifier to adjust the Annual Incentive Plan upward or downward for performance against our environmental, social and governance objectives and our safety objectives. The ESG modifier involves adjusting the initial payout factor by a multiple of 0.8 to 1.2. The ESG modifier reflects the Committee's consideration of the executive officers' role in advancing the Company's safety, culture and diversity and environmental performance. The ESG modifier is "universal", meaning that the same payout adjustment applied consistently for all executive officers. The maximum award (as a percentage of target) can result in up to a 20% reduction or increase to the payout that would otherwise be earned based on our adjusted EPS performance. For Fiscal 2022, the Committee applied an ESG modifier of 1.1.

Air Products' goal to reduce CO2 emissions intensity one-third by 2030 from a 2015 baseline has been considered in the above compensation program.

**Explain how this incentive contributes to the implementation of your organization's climate commitments and/or climate transition plan**

Linking the CO2 emissions intensity goal to executive compensation contributes to the continued implementation of and investment in low and zero carbon projects which are key actions for achieving the stated goals. The direct tie to compensation incentivizes executives to consider the carbon intensity when deciding on the strategy and direction of the company.

**Entitled to incentive**

Corporate executive team

**Type of incentive**

Monetary reward

**Incentive(s)**

Bonus - % of salary

**Performance indicator(s)**

Progress towards a climate-related target

Reduction in emissions intensity

**Incentive plan(s) this incentive is linked to**

Both Short-Term and Long-Term Incentive Plan

**Further details of incentive(s)**

Air Products' Management Development and Compensation Committee has discretion to apply an ESG modifier to adjust the Annual Incentive Plan upward or downward for performance against our environmental, social and governance objectives and our safety objectives. The ESG modifier involves adjusting the initial payout factor by a multiple of 0.8 to 1.2. The ESG modifier reflects the Committee's consideration of the executive officers' role in advancing the Company's safety, culture and diversity and environmental performance. The ESG modifier is "universal", meaning that the same payout adjustment applied consistently for all executive officers. The maximum award (as a percentage of target) can result in up to a 20% reduction or increase to the payout that would otherwise be earned based on our adjusted EPS performance. For Fiscal 2022, the Committee applied an ESG modifier of 1.1.

Air Products' goal to reduce CO2 emissions intensity one-third by 2030 from a 2015 baseline has been considered in the above compensation program.

**Explain how this incentive contributes to the implementation of your organization's climate commitments and/or climate transition plan**

Linking the Company's progress towards its CO2 emissions intensity goal to executive compensation contributes to the continued implementation of and investment in low and zero carbon projects which are key actions for achieving the stated goals. The direct tie to compensation incentivizes executives to consider the carbon intensity when deciding on the strategy and direction of the company.

**Entitled to incentive**

Management group

**Type of incentive**

Monetary reward

**Incentive(s)**

Bonus – set figure

**Performance indicator(s)**

Energy efficiency improvement

**Incentive plan(s) this incentive is linked to**

Both Short-Term and Long-Term Incentive Plan

**Further details of incentive(s)**

The Company's Annual Incentive Plan and Variable Pay Program provide cash compensation that rewards eligible employees for meeting established business unit goals. These goals include financial results that are influenced by the management of commercial, financial and technical risk, as well as safety and environmental performance. The Variable Pay Program reinforces Air Products' strategy to be the safest, most profitable and diverse industrial gas company in the world, providing excellent service to our customers. It links the variable portion of cash compensation to company and business unit results, providing line of sight for employees.

"Energy Efficiency Improvement" was selected as the incentivized activity. These targets are also tied to our emissions reduction targets.

**Explain how this incentive contributes to the implementation of your organization's climate commitments and/or climate transition plan**

By providing variable pay incentives to managers based on criteria including energy efficiency and emissions reductions, these employees are more likely to develop innovative solutions that help achieve company climate commitments.

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**Entitled to incentive**

All employees

**Type of incentive**

Non-monetary reward

**Incentive(s)**

Internal company award

**Performance indicator(s)**

Other (please specify) (Biennial recognition)

**Incentive plan(s) this incentive is linked to**

Not part of an existing incentive plan

**Further details of incentive(s)**

In addition to monetary awards, the Company also recognizes individuals, teams and facilities that demonstrate leadership in Environmental, Health and Safety (EHS) and Sustainability through the Chairman's EHS Awards. Efforts that are recognized often include projects related emissions reduction and energy savings.

**Explain how this incentive contributes to the implementation of your organization's climate commitments and/or climate transition plan**

By providing recognition to employees based on criteria including energy efficiency and emissions reductions, these employees are more likely to develop innovative solutions that help achieve company climate commitments.

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## C2. Risks and opportunities

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### C2.1

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

Yes

#### C2.1a

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**(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	30	

#### C2.1b

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

Air Products defines substantive risks as those risks that could have a material, adverse effect on the Company's business, operating results or financial condition. Material effects are identified in accordance with the definition of materiality under the U.S. federal securities laws. ([a] matter is 'material' if there is a substantial likelihood that a reasonable person would consider it important.) Substantive risks are reported each year in Air Products' Annual Report on Form 10-K and material changes to these risks are reported as needed in Air Products' Quarterly Reports on Form 10-Q. Key risk factors related to greenhouse gases (GHGs) and climate change that were reported in the 2022 Annual Report included:

1. legislative, regulatory and societal responses to global climate change;
2. potential interruptions in energy supply and price fluctuations;
3. costs and expenses resulting from compliance with environmental regulations; and,
4. catastrophic events that could disrupt operations, suppliers or customers.

As described below, the potential financial impacts of these risks range from \$25 to \$110 million, which represent a significant financial impact for Air Products:

1. If Air Products' Scope 1 emissions were subject to additional cap and trade schemes or carbon taxes, the potential financial impact could be \$25.2 million USD assuming a cost of \$30/metric ton of CO<sub>2</sub> and 95% recovery of the costs through contractual terms.
2. If energy prices were to increase due to GHG regulations, the potential financial impact could be \$110 million USD assuming a hypothetical 10% increase on energy prices and 45% recovery of the costs through contractual terms.
3. If regulatory costs doubled due to new compliance requirements, the potential financial impact could be \$20 million and \$44 million in capital and operating costs, respectively, based on Air Products' spending in 2022 for these matters.

## C2.2

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

#### Value chain stage(s) covered

Direct operations  
Upstream  
Downstream

#### Risk management process

Integrated into multi-disciplinary company-wide risk management process

#### Frequency of assessment

More than once a year

#### Time horizon(s) covered

Short-term  
Medium-term  
Long-term

#### Description of process

Process to determine risks

Air Products identifies, assesses and manages climate-related risks through an interdisciplinary approach. Our Board of Directors has accountability for oversight of environmental and safety performance, which it reviews at least quarterly. The Corporate Governance and Nominating Committee of the Board has responsibility for monitoring our response to important public policy issues, including sustainability, which the Committee reviews on a regular basis. The Company's Enterprise Risk Management (ERM) program includes the identification of risks across the company that are reported annually to the Board of Directors, and we review climate-related developments and the need to assess specific climate risks as part of our internal audit program. We also incorporate climate-related risks into annual financial reporting, defining substantive risks as those risks that could have a material, adverse effect on the Company's business, operating results or financial condition in accordance with the definition of materiality under the U.S. federal securities laws. ([a] matter is 'material' if there is a substantial likelihood that a reasonable person would consider it important).

Air Products' businesses operate on a regional basis, with regional reporting segments for the Americas, Asia, Europe and the Middle East and India. Therefore, regional environmental experts identify and review risks (transitional and physical) related to climate change and communicate risks to potentially impacted businesses.

Transitional risks for our direct operations are primarily related to new and/or modified regulations linked to climate change, such as emissions trading systems and carbon pricing mechanisms. Although uncertain, these developments could increase our costs related to consumption of electric power and hydrogen production and application of our gasification technology. Any legislation that limits or taxes GHG emissions could negatively impact our growth, increase our operating costs, or reduce demand for certain of our products. We aim to mitigate most of the increased costs through contractual terms.

Physical risks are identified and assessed for existing facilities and new facilities. This analysis includes the evaluation of risks based on facility locations, some of which may be more vulnerable to the impacts of climate change.

The transition and physical risks described above are relevant on short-term, medium-term, and long-term time horizons.

The potential financial risks of legislative, regulatory and societal responses to global climate change are examined at least annually. As noted in our Annual Report, any legislation or governmental action that limits or taxes GHG emissions could negatively impact our growth, increase our operating costs, or reduce demand for certain of our products. While the Company's products enable its customers to be more energy efficient and sustainable, perceptions of some of our energy-intensive products may change as the world transitions to a lower-carbon economy.

#### Addressing climate-related risks

Regulatory risks are managed at the regional level as regulations vary by jurisdiction. Regional environmental experts assess the risks and work with potentially impacted businesses to address them. In addition, the mitigation of costs through contractual terms, as well as our efforts to reduce the energy and emissions intensity of our operations, are part of our strategy to address transition risks.

Physical risks are addressed through plant design and engineering aimed at minimizing severe weather impacts. For example, our facility structures and foundations are designed based on regional wind velocities that consider 50 years of climate data. Likewise, in the design and layout of our plants we evaluate how to eliminate or minimize flooding risks based on site drainage where we identify this as an issue, as well as the use of flood walls and elevation for sensitive equipment if necessary. Our Emergency Response and Business Continuity Planning processes also support the response to severe weather events that may be exacerbated by climate change.



The production of industrial gases is energy intensive, which is why we have continually increased the energy efficiency of our ASU and hydrogen and carbon monoxide (HyCO) facilities through improved plant designs and efficient operations. These efforts also reduce CO2 emissions and water consumption. In fact, improving energy efficiency is one of the five mechanisms we are focused on to meet our "Third by '30" CO2 emissions intensity reduction goal. We carefully track and manage energy purchases, and our conservation programs are focused on continually improving energy efficiency across our plants, particularly larger facilities. Efficiency improvements are realized through higher plant utilization, increased production at new, larger, and more efficient facilities and through facility improvement projects. Several of our facilities have been certified to the ISO 50001 Energy Standard.

Air Products has a number of sustainable offerings that improve energy efficiency, reduce environmental impact, and/or address a societal need. Each year our Sustainability Team examines the sales of these offerings and looks for positive or negative trends. Our Sustainability Team, regional environmental experts and regional businesses also evaluate the potential for customers to deselect our products as increased customer concerns about climate risks could potentially lead to reduced product demand for certain products due to the energy intensity of company products.

#### Case study

An example of Air Products' efforts to manage regulatory risks is related to emissions trading for hydrogen in the European Union (EU).

**Situation:** The EU Emissions Trading System (ETS) has undergone multiple revisions, some of which included the possibility of a provision that could result in different treatments between our plants and our customers' alternative inhouse supply options for hydrogen that could lead to increased CO2 emissions.

**Task:** Air Products' task was to seek comparable treatment under the EU Emissions Trading System for all hydrogen producers, regardless of ownership structure, so as to not unduly disadvantage the over-the-fence supply model we use and which also enables hydrogen to be produced most efficiently and with lower emissions.

**Action:** We supported the quantification of potential market distortions due to EU ETS changes and how such distortions could harm the EU industrial gas industry and result in increased emissions. This information was shared through engagement with policy makers in Europe.

**Result:** A non-distortion principle was included in the relevant EU ETS Directive, and that principle has been upheld in subsequent rulemaking therefore enabling comparable treatment for hydrogen producers.

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## C2.2a

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

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	<p>Some of our operations are within jurisdictions that have or are developing regulatory regimes governing emissions of GHGs, including CO2. These include existing coverage under the European Union Emission Trading System, the California Cap-and-Trade Program, China's Emission Trading Scheme and its nation-wide expansion, and South Korea's Emission Trading Scheme. In the Netherlands, a CO2 emissions tax was enacted on 1 January 2021. In Canada, Alberta's Technology Innovation and Emission Reduction System went into effect 1 January 2020. In Ontario, Environment &amp; Climate Change Canada's Output Based Pricing System ("OBPS") was replaced by the GHG Emissions Performance Standards ("EPS") program beginning 1 January 2022. In Singapore, the Carbon Pricing Tax Act was implemented effective 1 January 2019. In Taiwan, Greenhouse Gases Emissions Registration and Verification Management Act will be enforced beginning in 2023. In addition, the U.S. Environmental Protection Agency ("EPA") requires mandatory reporting of GHG emissions and is regulating GHG emissions for new construction and major modifications to existing facilities. Some jurisdictions have various mechanisms to target the power sector to achieve emission reductions, which often result in higher power costs.</p> <p>Any legislation that limits or taxes GHG emissions could negatively impact our growth, increase our operating costs, or reduce demand for certain of our products.</p> <p>Regulatory changes can also create business opportunities for Air Products as we help our customers improve energy efficiency and reduce environmental impact. We also see significant opportunities for hydrogen for mobility and energy transition, carbon capture technologies, and gasification.</p>
Emerging regulation	Relevant, always included	<p>Increased public concern may result in more international, U.S. federal, and/or regional requirements to reduce or mitigate the effects of GHGs. Although uncertain, these developments could increase our costs related to consumption of electric power and hydrogen production. We believe we will be able to mitigate some of the increased costs through contractual terms.</p> <p>Any legislation that limits or taxes GHG emissions could negatively impact our growth, increase our operating costs, or reduce demand for certain of our products.</p>
Technology	Relevant, always included	<p>Technology innovations could impact the use of some of the Company's products. One example is hydrogen. As the world's leading supplier of hydrogen, Air Products supplies vast quantities of hydrogen to petroleum refiners to lower sulfur content and help in the making of cleaner-burning gasoline and diesel fuels that significantly reduce vehicle emissions. Technologies that enable alternative fuels, improve fuel efficiency or reduce the weight of vehicles could reduce consumption of transportation fuels that require hydrogen for processing. At the same time, we see significant opportunities to expand the use of hydrogen as a transportation fuel and energy carrier.</p>
Legal	Relevant, always included	<p>Some of our operations are within jurisdictions that have or are developing regulatory regimes governing emissions of GHGs, including CO2. These include existing coverage under the European Union Emission Trading System, the California Cap-and-Trade Program, China's Emission Trading Scheme and its nation-wide expansion, and South Korea's Emission Trading Scheme. In the Netherlands, a CO2 emissions tax was enacted on 1 January 2021. In Canada, Alberta's Technology Innovation and Emission Reduction System went into effect 1 January 2020. In Ontario, OBPS was replaced by the EPS program beginning 1 January 2022. In Singapore, the Carbon Pricing Tax Act was implemented effective 1 January 2019. In Taiwan, Greenhouse Gases Emissions Registration and Verification Management Act will be enforced beginning in 2023. In addition, the EPA requires mandatory reporting of GHG emissions and is regulating GHG emissions for new construction and major modifications to existing facilities. Some jurisdictions have various mechanisms to target the power sector to achieve emission reductions, which often result in higher power costs.</p> <p>Any legislation that limits or taxes GHG emissions could negatively impact our growth, increase our operating costs, or reduce demand for certain of our products.</p> <p>The Company has not been subject to climate-related litigation claims.</p>
Market	Relevant, always included	<p>Air Products supplies industrial gases and related equipment that help its customers be more energy efficient and sustainable. The Company has a number of sustainable offerings that improve energy efficiency, reduce environmental impact, and/or address a societal need. Each year our Sustainability Team examines the sales of these offerings and looks for positive or negative trends.</p> <p>Over the past three years, the Company has seen an increase in customer interest in GHG emissions and product carbon footprints. Our Sustainability Team, regional environmental experts and regional businesses evaluate the potential risk of customers deselecting our products as increased customer concerns about climate risks could potentially lead to reduced product demand for certain products due to the energy intensity of company products. Some customers have indicated they are considering the inclusion of GHG emissions and carbon footprints in their supplier selection process.</p> <p>Customer interest in climate change can also create business opportunities for Air Products as we help our customers improve energy efficiency and reduce environmental impact. We also see significant opportunities for hydrogen for mobility and energy transition, carbon capture technologies and gasification.</p>
Reputation	Relevant, always included	<p>Air Products has built a reputation for its innovative culture, operational excellence and commitment to safety and the environment. While the Company's products enable its customers to be more energy efficient and sustainable, perceptions of some of our energy-intensive products may change as the world transitions to a lower-carbon economy. We are also supporting this transition by seeking opportunities to further deploy our carbon capture technologies and scaling hydrogen production and fueling infrastructure to ensure its successful adaptation as a sustainable fuel.</p>
Acute physical	Relevant, sometimes included	<p>Our operations could be impacted by catastrophic events outside our control, including severe weather conditions such as hurricanes, floods and other storms. Any such event could cause a serious business disruption that could affect our ability to produce and distribute products and possibly expose us to third-party liability claims. Additionally, such events could impact our suppliers or customers, which could cause energy and raw materials to be unavailable to us, or our customers to be unable to purchase or accept our products and services. Any such occurrence could have a negative impact on our operations and financial results.</p>
Chronic physical	Relevant, sometimes included	<p>Air Products is monitoring several potential and chronic physical risks related to climate change, including water security, changes in precipitation patterns, higher temperatures, sea level rise and higher levels of atmospheric carbon dioxide. At the present time, the Company does not consider these to be material risks but does see a need to monitor risk developments.</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.**

**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

**Climate risk type mapped to traditional financial services industry risk classification**

<Not Applicable>

### Company-specific description

Legislative, regulatory and societal responses to global climate change create financial risk.

We are the world's leading supplier of hydrogen, the primary use of which is the production of ultra-low sulfur transportation fuels that have significantly reduced transportation emissions and helped improve human health. To make the high volumes of hydrogen needed by our customers, we use steam methane reforming, which releases CO<sub>2</sub>.

Some of our operations are within jurisdictions that have or are developing regulatory regimes governing emissions GHGs, including CO<sub>2</sub>. These include existing coverage under the European Union Emission Trading System, the California Cap-and-Trade Program, China's Emission Trading Scheme and its nation-wide expansion, and South Korea's Emission Trading Scheme. In the Netherlands, a CO<sub>2</sub> emissions tax was enacted on 1 January 2021. In Canada, Alberta's Technology Innovation and Emission Reduction System went into effect 1 January 2020. In Ontario, OBPS was replaced by the EPS program beginning 1 January 2022. In Singapore, the Carbon Pricing Tax Act was implemented effective 1 January 2019. In Taiwan, Greenhouse Gases Emissions Registration and Verification Management Act will be enforced beginning in 2023. In addition, the EPA requires mandatory reporting of GHG emissions and is regulating GHG emissions for new construction and major modifications to existing facilities. Some jurisdictions have various mechanisms to target the power sector to achieve emission reductions, which often result in higher power costs.

Increased public concern may result in more international, U.S. federal, and/or regional requirements to reduce or mitigate the effects of GHG. Although uncertain, these developments could increase our costs related to consumption of electric power and hydrogen production. We believe we will be able to mitigate some of the increased costs through contractual terms, but the lack of definitive legislation or regulatory requirements prevents an accurate estimate of the long-term impact these measures will have on our operations. Any legislation that limits or taxes GHG emissions could negatively impact our growth, increase our operating costs, or reduce demand for certain of our products.

### Time horizon

Medium-term

### Likelihood

Likely

### Magnitude of impact

Low

### Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

### Potential financial impact figure (currency)

25200000

### Potential financial impact figure – minimum (currency)

<Not Applicable>

### Potential financial impact figure – maximum (currency)

<Not Applicable>

### Explanation of financial impact figure

The lack of definitive legislation or regulatory requirements prevents an accurate estimate of the impact these measures will have on our operations.

The estimate of \$25.2 million assumes that:

- Our direct (Scope 1) CO<sub>2</sub> emissions become subject to cap and trade schemes or carbon taxes
- The cost of carbon averages \$30 per metric ton of CO<sub>2</sub>
- In excess of 95% of these costs are expected to be recovered through contractual terms

The calculation for the potential financial impact is:

16,800,000 MT CO<sub>2</sub> x \$30/MT CO<sub>2</sub> x 5% = \$25,200,000

### Cost of response to risk

1000000

### Description of response and explanation of cost calculation

Description of response:

Regional environmental experts identify and review risks (transitional and physical) related to climate change and communicate risks to potentially impacted businesses. The businesses work with environmental experts and Government Relations personnel to develop and execute strategies to address climate-related risks.

### Case study

An example of Air Products' efforts to manage regulatory risks is related to emissions trading for hydrogen in the EU.

Situation: The EU ETS has undergone multiple revisions, some of which included the possibility of a provision that could result in different treatments between our plants and our customers' alternative inhouse supply options for hydrogen and that could lead to increased CO<sub>2</sub> emissions.

Task: Air Products' task was to seek comparable treatment under the EU Emissions Trading System for all hydrogen producers, regardless of ownership structure, so as to not unduly disadvantage the over-the-fence supply model we use and that enables hydrogen to be produced most efficiently.

Action: We supported the quantification of potential market distortions due to EU ETS and how such distortions could harm the EU industrial gas industry and result in increased emissions. This information was shared through engagement with policy makers in Europe.

Result: A non-distortion principle was included in the relevant EU ETS Directive, and that principle has been upheld in subsequent rulemaking therefore enabling comparable treatment for hydrogen producers. This is considered a medium-time horizon risk based on the updates of the legislation.

Explanation of cost calculation:

The Company has incurred modest additional costs to actively engage in and monitor climate change risks and opportunities. This includes the efforts of our Environmental Teams, as well as costs associated with reduction commitments and customer engagement for cost recovery through contracts. Such costs are budgeted in the normal course of business. An estimate of the scale of those costs is less than \$1 million per year, with about 40% of the costs for environmental resources, 40% for reduction commitments, and 20% for contractual recovery.

### Comment

### Identifier

Risk 2

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

Direct operations

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

Market	Other, please specify (Increasing energy costs)
--------	---

**Primary potential financial impact**

Increased direct costs

**Climate risk type mapped to traditional financial services industry risk classification**

<Not Applicable>

**Company-specific description**

Energy, including electricity, natural gas, and diesel fuel for delivery trucks is the largest cost component of our business. Because our industrial gas facilities use substantial amounts of energy, energy price fluctuations could materially impact our revenues and earnings. A disruption in the supply of energy, components, or raw materials, whether due to market conditions, legislative or regulatory actions, natural events, or other disruption, could prevent us from meeting our contractual commitments and harm our business and financial results.

We typically contract to pass-through cost increases in energy to customers, but cost variability can still have a negative impact on our results. We may be unable to raise prices as quickly as costs rise, or competitive pressures may prevent full recovery of such costs. Increases in energy or raw material costs that cannot be passed on to customers for competitive or other reasons may negatively impact our revenues and earnings. Even where costs are passed through, price increases can cause lower sales volume.

**Time horizon**

Medium-term

**Likelihood**

Likely

**Magnitude of impact**

Low

**Are you able to provide a potential financial impact figure?**

Yes, a single figure estimate

**Potential financial impact figure (currency)**

110000000

**Potential financial impact figure – minimum (currency)**

<Not Applicable>

**Potential financial impact figure – maximum (currency)**

<Not Applicable>

**Explanation of financial impact figure**

A hypothetical 10% increase in energy price increases due to GHG regulations would raise Air Products' energy costs by \$200 million based on our annual spend of \$2 billion for energy. If the price of energy were to increase in this way, the Company believes it would be able to recover approximately 45% of the potential costs through contractual terms.

The calculation for the potential financial impact is:

\$2 billion x 10% x (1- 45%) = \$110 million

**Cost of response to risk**

1000000

**Description of response and explanation of cost calculation**

Description of response:

Energy consumption is the most significant variable cost of Air Products' operations, and we carefully track and manage energy purchases. Our conservation programs are focused on continually improving energy efficiency, particularly for our larger facilities that consume the most energy. For example, our steam methane reformers maximize energy efficiency and optimize heat integration. This reduces energy consumed and emissions by converting more feedstock into hydrogen. Likewise, we have continually improved the energy efficiency of our air separation units and have improved energy efficiency for our plants in North America by at least 30% since 1980.

**Case study**

Below is an example of Air Products' efforts to improve energy efficiency and therefore reduce the potential impact of energy price fluctuations.

Situation: Air Separation Units (ASUs) use a significant amount of energy to compress air so that it can be cryogenically distilled into individual gases, specifically nitrogen, oxygen and argon.

Task: Air Products' task was to identify opportunities to improve the energy efficiency of our ASUs.

Action: Air Products' engineering and operations personnel identified process modifications for existing facilities, and design improvements for new facilities, that would enable the use of less electricity per unit of production. The Company also set goals to improve energy efficiency and publicly reported on the results.

Result: Between 2007 and 2015, which was the time period for our first set of goals, Air Products improved the energy efficiency of its ASUs by 8%. During the second goal period of 2015-2020, Air Products improved ASU energy efficiency by an additional 3.3%. In 2022, Air Products continued to improve ASU energy efficiency by 6% compared to 2021. These efforts have reduced our energy consumption and resulted in avoided costs of nearly \$100 million USD in 2022.

Explanation of cost calculation:

The Company has incurred modest additional costs to actively engage in and monitor climate change risks and opportunities. This includes the efforts of our Environmental Teams, as well as costs associated with reduction commitments and customer engagement for cost recovery through contracts. Such costs are budgeted in the normal course of business. An estimate of the scale of those costs is less than \$1 million per year with about 40% for environmental resources, 40% for reduction commitments and 20% for contractual recovery.

**Comment**

**Identifier**

Risk 3

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

Direct operations

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

Acute physical	Cyclone, hurricane, typhoon
----------------	-----------------------------

**Primary potential financial impact**

Decreased revenues due to reduced production capacity

**Climate risk type mapped to traditional financial services industry risk classification**

<Not Applicable>

**Company-specific description**

Catastrophic events could disrupt our operations or the operations of our suppliers or customers, having a negative impact on our business, financial results, and cash flows. Our operations could be impacted by catastrophic events outside our control, including severe weather conditions such as hurricanes, floods and other storms. Any such event could cause a serious business disruption that could affect our ability to produce and distribute products and possibly expose us to third-party liability claims. Additionally, such events could impact our suppliers or customers, which could cause energy and raw materials to be unavailable to us, or our customers to be unable to purchase or accept our products and services. Any such occurrence could have a negative impact on our operations and financial results.

**Time horizon**

Short-term

**Likelihood**

Likely

**Magnitude of impact**

Low

**Are you able to provide a potential financial impact figure?**

Yes, a single figure estimate

**Potential financial impact figure (currency)**

10000000

**Potential financial impact figure – minimum (currency)**

<Not Applicable>

**Potential financial impact figure – maximum (currency)**

<Not Applicable>

**Explanation of financial impact figure**

Air Products has significant assets in areas that are subject to weather events that may be exacerbated by climate change, particularly in the U.S. Gulf Coast region. The potential financial impact of these events has been estimated at \$10 million. This figure was developed with our insurers and considers the actual impacts of past weather events. The potential risk is spread over multiple locations and mitigated to a large extent by how the Company designs its facilities, with environmental considerations such as wind, rainfall and flooding considered during plant siting and design.

**Cost of response to risk**

33000000

**Description of response and explanation of cost calculation**

Description of response:

Air Products ensures the resiliency of our facilities through engineering plant design. For example, our structures and related foundations are designed based on regional wind velocities that consider 50 years of climate data. Likewise, in the design and layout of our plants we evaluate how to eliminate or minimize flooding risks based on site drainage where we identify this as an issue, as well as the use of flood walls and elevation for sensitive equipment if necessary.

**Case study**

Below is a recent example of an activity undertaken to address increasing rain and flooding at a Gulf Coast facility.

Situation: Storms in Texas have increased in intensity and duration in recent years, increasing the potential for flooding events that may potentially impact plant operations.

Task: Design a system to manage the increased amount of water at a new facility.

Action: The facility installed a stormwater detention/retention pond based on the 25-year storm event criteria that had been recently updated due to the increasing storms in Texas.

Result: No issues have occurred at the facility.

**Explanation of cost calculation:**

Engineering and equipment costs that support facility resiliency from natural disasters are included in the normal course of plant design. An approximation of these costs is 1% of our capital expenditures. Based on a three-year average capital expenditure of \$3.3 billion, the estimated cost for these efforts is \$33 million. The calculation for the cost of response is:

\$3.3 billion x 1% = \$33 million

**Comment**

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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

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C2.4a

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

**Identifier**

Opp1

**Where in the value chain does the opportunity occur?**

Downstream

**Opportunity type**

Products and services

**Primary climate-related opportunity driver**

Development and/or expansion of low emission goods and services

**Primary potential financial impact**

Increased revenues resulting from increased demand for products and services

**Company-specific description**

We have developed a portfolio of technologies that capture carbon dioxide (CO<sub>2</sub>) from steam methane reforming. In Port Arthur, Texas, Air Products operates the largest CO<sub>2</sub> purification and capture project for enhanced oil recovery (EOR) by an industrial gas company. Air Products designed, constructed and operates the state-of-the-art system to capture CO<sub>2</sub> from two steam methane reformers (SMRs). The CO<sub>2</sub> removal technology was retrofitted to the SMRs, which produce hydrogen to assist in the making of cleaner burning transportation fuels by refinery customers on Air Products' Gulf Coast hydrogen pipeline network. Since 2013, when it initiated onstream capture operations, Air Products has captured nearly one million tons per year of CO<sub>2</sub> at Port Arthur that has been put to beneficial use.

Carbon capture is essential to meeting the Paris climate goals. Significant opportunities are available to capture CO<sub>2</sub> from gasifiers and hydrogen plants, and we can deploy our carbon capture technologies and other technologies developed by Air Products in new plants or by retrofitting existing ones. We are also employing our carbon capture technology in our blue hydrogen projects including our Clean Hydrogen Complex in Louisiana, U.S.

**Time horizon**

Medium-term

**Likelihood**

Likely

**Magnitude of impact**

Medium

**Are you able to provide a potential financial impact figure?**

Yes, a single figure estimate

**Potential financial impact figure (currency)**

1800000000

**Potential financial impact figure – minimum (currency)**

&lt;Not Applicable&gt;

**Potential financial impact figure – maximum (currency)**

&lt;Not Applicable&gt;

**Explanation of financial impact figure**

The potential financial impact of carbon capture depends on the policies and the partnership frameworks necessary for the advancement and proliferation of this technology. Internationally, momentum is building for carbon capture across the private sector, governments and industry bodies. Experts suggest that carbon capture deployment will need to increase substantially by 2030 to meet the objectives of the Paris Agreement, which represents storing 850 metric tons per year, up from just 30 metric tons per year today.

The value of the global carbon capture and storage market is estimated at \$11.8 billion in 2023 and is projected to grow at a CAGR of 14.5% during 2022-2023. Assuming that Air Products captures at least 10% of the market with its carbon capture technologies, the potential financial impact would be at least \$1.8 billion. We see significant opportunities for carbon capture and expect the market size will increase accordingly.

The calculation for the potential financial impact is:

\$11.8 billion x 10% = \$1.8 billion

**Cost to realize opportunity**

59000000

**Strategy to realize opportunity and explanation of cost calculation**

Strategy to realize opportunity:

We see significant opportunities to capture CO<sub>2</sub> from gasifiers and hydrogen plants for use in enhanced oil recovery, sequestration and dry reforming. To pursue these opportunities, Air Products has a strategic organization focused on developing and winning large-scale CO<sub>2</sub> capture and related technology projects around the world. We are also incorporating carbon capture into several mega-scale hydrogen projects, such as our Clean Energy Complex in Louisiana, U.S. Likewise, we continue to explore new possible end uses for captured carbon, supporting a more circular economy.

Case study:

Below is a recent example of a recent project that illustrates the opportunity for carbon capture.

Situation: Hydrogen plays a key role in helping the world move forward with the energy transition and in building a cleaner, more sustainable future. The key now is scaling up to create the hydrogen infrastructure that businesses and governments need to make the switch to this clean energy on a major scale.

Task: Create viable projects that will enable the production of low-carbon hydrogen on a large scale.

Action: In 2022, Air Products continued work on its Louisiana Clean Energy Complex that will produce low-carbon hydrogen to power mobility and industrial markets in the Gulf Coast of the U.S. and beyond. At a cost of \$4.5 billion, this project is the largest U.S. investment by Air Products and a major investment in the State of Louisiana.

Result: At the Clean Energy Complex, 95% of the carbon dioxide emissions (over five million tons per year) will be captured and permanently sequestered in ideal geological pore space in Louisiana.

Explanation of cost to realize the carbon capture opportunity:

A 2017 study by the Global CCS Institute estimated the capital cost for carbon capture for a natural gas processing facility at \$49 million, which would be about \$59 million in 2023. This is the basis of the estimated cost. The actual capital cost of the carbon capture equipment at the Clean Energy Complex is confidential.

**Comment****Identifier**

Opp2

**Where in the value chain does the opportunity occur?**

Downstream

**Opportunity type**

Energy source

**Primary climate-related opportunity driver**

Use of lower-emission sources of energy

**Primary potential financial impact**

Increased revenues resulting from increased demand for products and services

**Company-specific description**

As the world's leading hydrogen producer, we are an important contributor to bringing hydrogen to scale on the way to a clean energy future.

The world faces a huge challenge in making the shift toward clean, sustainable energy sources. In many ways, hydrogen is a great solution. It enables the integration of renewables into power generation, fuels and distributing energy across sectors and regions supporting the decarbonization of transportation and energy use. When used in a fuel cell, hydrogen is nearly two times more efficient than gasoline and diesel on a well-to-wheel basis and produces no emissions. Hydrogen can also be made from renewable resources.

To enable successful commercialization of hydrogen vehicles around the world, Air Products has taken a leadership position in the development of hydrogen supply and fueling infrastructure. Our plan has been to demonstrate how to build out a hydrogen market holistically. We are also supporting the development and use of hydrogen in trucks, buses, trains, river boats, cruise ships and for material handling.

**Time horizon**

Short-term

**Likelihood**

Virtually certain

**Magnitude of impact**

Medium

**Are you able to provide a potential financial impact figure?**

Yes, an estimated range

**Potential financial impact figure (currency)**

<Not Applicable>

**Potential financial impact figure – minimum (currency)**

20000000000

**Potential financial impact figure – maximum (currency)**

30000000000

**Explanation of financial impact figure**

Research suggests the market for hydrogen will increase to \$200-300 billion by 2030 with annual production approaching 200 million tonnes of hydrogen. Assuming Air Products captures 10% of this market share results in a potential financial impact of \$20-30 billion.

The calculation for the potential financial impact is:  
\$200 billion x 10% = \$20 billion per year by 2030 to  
\$300 billion x 10% = \$30 billion per year by 2030

**Cost to realize opportunity**

11000000000

**Strategy to realize opportunity and explanation of cost calculation**

Strategy to realize opportunity:

Air Products sees significant opportunities to solve sustainability challenges through hydrogen for mobility and the energy transition. Air Products, the leading global supplier of hydrogen to refineries to assist in producing cleaner burning transportation fuels, has significant experience in the hydrogen fueling industry on which it can build. We expect to see the global demand for hydrogen increase and are prepared to supply this valuable fuel.

Case study:

Below is a recent example of a project that illustrates the opportunity for green hydrogen.

Situation: Hydrogen plays a key role in helping the world move forward with the energy transition and in building a cleaner, more sustainable future. The key now is scaling up to create the hydrogen infrastructure that businesses and governments need to make the switch to this clean energy on a major scale. Blue hydrogen is produced from fossil fuels and utilizes carbon capture and sequestration to reduce CO2 emissions. Green hydrogen produced from the electrolysis of water using renewable electricity has the lowest carbon footprint of the various types of hydrogen.

Task: Create viable projects that will enable the production of blue and green hydrogen on a large scale.

Action: Air Products has hydrogen projects in execution in Alberta, Canada for a net-zero hydrogen energy complex; a blue hydrogen energy facility in Louisiana, United States; a green ammonia project in NEOM, Kingdom of Saudi Arabia; and a sustainable aviation fuel project in California, United States. These are all real projects under implementation. We have also announced a project in New York using hydropower, and a large-scale zero-carbon hydrogen project in Texas using solar and wind power.

Result: When onstream, these projects will produce significant volumes of low- and zero-carbon hydrogen for the energy transition and hydrogen mobility markets and increase Air Products' total hydrogen production by nearly 30 %.

Explanation of cost to realize opportunity:

The \$11 billion cost represents Air Products' commitment through 2022 to energy transition projects that will produce blue and green hydrogen. In addition, Air Products has set an industry-leading capital commitment to accelerate the energy transition by spending or committing more than \$15 billion in capital expenditures between 2018 and 2027 on these first-mover projects.

**Comment**

**Identifier**

Opp3

**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 resulting from increased demand for products and services

**Company-specific description**

The potential demand for clean energy could increase demand for oxygen, one of our main products, and boost demand for our proprietary technology for delivering low-cost oxygen.

Air Products' oxy-fuel systems enable the efficient production of biodiesel, biopower/bioheat, cellulosic biofuels and synthetic gas (syngas). Oxygen can increase boiler or furnace efficiency, reduce fuel consumption due to increased available heat, enable use of lower heating value fuels, increase flame stability, and increase turndown capability. Oxygen injection using Air Products' oxy-fuel burners in boilers or furnaces can lead to lower oxygen consumption compared to general oxygen enrichment while providing the same benefits. Oxygen-enhanced gasification can convert abundant natural resources to syngas that enables the production of liquid fuels, high-end chemicals and power.

**Time horizon**

Short-term

**Likelihood**

Very likely

**Magnitude of impact**

Medium

**Are you able to provide a potential financial impact figure?**

Yes, an estimated range

**Potential financial impact figure (currency)**

&lt;Not Applicable&gt;

**Potential financial impact figure – minimum (currency)**

183000000

**Potential financial impact figure – maximum (currency)**

365000000

**Explanation of financial impact figure**

Air Products has designed, built and is operating world-scale ASUs with capacities of 10,000 tons per day of oxygen. The potential financial impact is based on completing a project of similar scope and an oxygen price range of \$50-100 per ton.

The calculation for the potential financial impact is:

10,000 tons oxygen per day x 365 days x \$50 per ton of oxygen = \$183 million to

10,000 tons oxygen per day x 365 days x \$100 per ton of oxygen = \$365 million

Similar projects are expected, though the potential financial impact figure is not available.

**Cost to realize opportunity**

300000000

**Strategy to realize opportunity and explanation of cost calculation**

Strategy to realize opportunity:

We see significant opportunities to solve sustainability challenges through gasification, carbon capture technology solutions, and hydrogen for mobility and the energy transition. Gasification is one of the many tools necessary to help countries and customers meet the world's growing need for cleaner, sustainable chemicals and materials. Gasification plants typically convert low value hydrocarbons into useful chemicals and energy while significantly reducing harmful pollutants like sulfur oxides. The process produces carbon dioxide as a by-product that can be easily captured in a concentrated form, providing a pathway to reduce emissions where market conditions support carbon sequestration or utilization.

Case study:

Situation: Gasification is an effective tool for converting low value hydrocarbons into useful chemicals and energy and can be optimized to minimize emissions.

Task: Deliver gasification technology that can meet customer needs while optimizing performance.

Activity: Air Products acquired leading technologies for gasification – Shell's Coal Gasification Process (SCGP) and GE Energy's gasification technology – that give us the ability to process low value feedstocks more efficiently and to reduce overall emissions. At the same time, we are improving carbon conversion efficiency and scalability in gasification by enhancing the designs of our injectors, burners, and reactors. Likewise, our combustion technologists, industry engineers, and modelling specialists have developed decades of experience in oxygen-based technologies and work with customers to develop and test at full scale actual combustion and gasification systems using a full spectrum of gaseous, liquid, and solid fuels.

Result: Air Products' gasification technology has become an optimized solution for converting low-value hydrocarbon into useful chemicals and energy while significantly reducing harmful pollutants like sulfur oxides.

Explanation of cost to realize opportunity:

The cost reflects Air Products' investment of \$300 million to build, own and operate world-scale ASUs that provide the oxygen needed for gasification.

**Comment****C3. Business Strategy**



C3.1

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**(C3.1) Does your organization's strategy include a climate transition plan that aligns with a 1.5°C world?**

**Row 1**

**Climate transition plan**

Yes, we have a climate transition plan which aligns with a 1.5°C world

**Publicly available climate transition plan**

Yes

**Mechanism by which feedback is collected from shareholders on your climate transition plan**

We have a different feedback mechanism in place

**Description of feedback mechanism**

We work closely with our key stakeholders – customers, employees, investors, communities, suppliers, and government regulators – to understand and respond to their needs and collaborate for shared benefit. Meetings, presentations, and ongoing dialogue with stakeholders throughout the year provide many opportunities for collaboration on sustainability.

**Frequency of feedback collection**

More frequently than annually

**Attach any relevant documents which detail your climate transition plan (optional)**

**Explain why your organization does not have a climate transition plan that aligns with a 1.5°C world and any plans to develop one in the future**

<Not Applicable>

**Explain why climate-related risks and opportunities have not influenced your strategy**

<Not Applicable>

C3.2

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

	<b>Use of climate-related scenario analysis to inform strategy</b>	<b>Primary reason why your organization does not use climate-related scenario analysis to inform its strategy</b>	<b>Explain why your organization does not use climate-related scenario analysis to inform its strategy and any plans to use it in the future</b>
Row 1	Yes, qualitative and quantitative	<Not Applicable>	<Not Applicable>

C3.2a

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

Climate-related scenario	Scenario analysis coverage	Temperature alignment of scenario	Parameters, assumptions, analytical choices
Transition scenarios IEA B2DS	Company-wide	<Not Applicable>	<p>The temperature alignment of this scenario is 1.5°C.</p> <p>The Beyond 2°C Scenario (B2DS) of the International Energy Agency (IEA) has a rapid decarbonization pathway aligned with the Paris Agreement.</p> <p>Parameters and assumptions considered for the B2DS included:</p> <ul style="list-style-type: none"> <li>- Medium population growth to 9.7 billion people by 2050</li> <li>- All available policy levers are activated in every sector worldwide, including early actions to avoid lock-in of emissions-intensive infrastructure</li> <li>- Reliance on fossil fuels falls by almost two-thirds; the energy sector reaches carbon neutrality by 2060 and electricity becomes the largest final energy carrier, including for transportation; oil prices increase by a factor of 1.2 and gas prices increase by factors of 1.5 and 1.0 in the U.S. and Europe, respectively (prices are based on 2016-2050 timeframe)</li> <li>- Moderate economic development based on GDP growth rates (compounded annual growth rate = 2.9% for the world)</li> <li>- Rapid deployment of low-emissions technologies; the use of carbon capture and storage accounts for 36% of the emissions reduction</li> <li>- Agriculture, Forestry and Other Land Use-related emissions contribute a net total of -30 GtCO<sub>2</sub> emissions between 2010 and 2100</li> </ul> <p>Analytical choices were:</p> <ul style="list-style-type: none"> <li>- A time horizon of 2050 was chosen for the scenario (some parameters extended beyond 2050)</li> </ul>
Transition scenarios IEA 2DS	Company-wide	<Not Applicable>	<p>The temperature alignment of this scenario is 2°C.</p> <p>The 2°C Scenario (2DS) of the International Energy Agency (IEA) has a moderate decarbonization pathway.</p> <p>Parameters and assumptions considered for the 2DS included:</p> <ul style="list-style-type: none"> <li>- Medium population growth to 9.7 billion people by 2050</li> <li>- Early actions to avoid lock-in of emissions-intensive infrastructure</li> <li>- Reliance on fossil fuels falls by one-half; the energy sector reaches carbon neutrality by 2060; oil prices increase by a factor of 1.4 and gas prices increase by factors of 2.3 and 1.5 in the U.S. and Europe, respectively (prices are based on 2016-2050 timeframe)</li> <li>- Moderate economic development based on GDP growth rates (compounded annual growth rate = 2.9% for the world)</li> <li>- New and existing technologies to improve efficiency and optimize material use are implemented, the use of carbon capture and storage accounts for 14% of the emissions reduction</li> <li>- Agriculture, Forestry and Other Land Use-related emissions contribute a net total of -30 GtCO<sub>2</sub> emissions between 2010 and 2100</li> </ul> <p>Analytical choices were:</p> <ul style="list-style-type: none"> <li>- A time horizon of 2050 was chosen for the scenario (some parameters extended beyond 2050)</li> </ul>
Physical climate scenarios RCP 2.6	Company-wide	<Not Applicable>	<p>The temperature alignment of this scenario is 0.3-1.7°C.</p> <p>In RCP 2.6, radiative forcing peaks at 3.1 W/m<sup>2</sup> before returning to 2.6 W/m<sup>2</sup> by 2100. These results are achieved through a shift to renewable energy sources and concentrations peaking by 2050 followed by a modest decline to around 490 ppm by 2100. RCPs provide essential inputs to climate models but lack associated socioeconomic and ecological data. As a result, the Shared Socioeconomic Pathway of SSP1 was combined with RCP 2.6 for use in this scenario. The scenario is also called SSP126.</p> <p>Parameters and assumptions considered for SSP126 included:</p> <ul style="list-style-type: none"> <li>- Low to medium population growth</li> <li>- Improved management of issues at local and global level with tighter regulation of pollutants</li> <li>- Energy use changes including increasing renewable energy, lower carbon energy sources, medium growth of conventional fossil fuel resources and low growth of unconventional fossil fuel resources (e.g., shale gas)</li> <li>- Moderate economic development based on GDP growth rates</li> <li>- Rapid technological development directed toward environmentally friendly processes</li> <li>- Low levels of land use change</li> </ul> <p>Analytical choices were:</p> <ul style="list-style-type: none"> <li>- A time horizon of 2050</li> <li>- Use of RCP 2.6 and SSP1</li> </ul> <p>Primary impacts for the RCP2.6 scenario were evaluated relative to sea level rise, atmospheric CO<sub>2</sub> emissions and precipitation.</p>
Physical climate scenarios RCP 4.5	Company-wide	<Not Applicable>	<p>The temperature alignment of this scenario is 1.1-2.6°C.</p> <p>RCP 4.5 represents one of IPCC's intermediate stabilization pathways in which radiative forcing is stabilized at approximately 4.5 W/m<sup>2</sup> after 2100. RCPs provide essential input to climate models but lack associated socioeconomic and ecological data. As a result, the Shared Socioeconomic Pathway of SSP2 was used in this scenario. This scenario is also called SSP245.</p> <p>Parameters and assumptions considered for SSP245 included:</p> <ul style="list-style-type: none"> <li>- Medium population growth</li> <li>- Environmental policies focused on local pollutants</li> <li>- Energy use changes including some investment in renewables but medium growth of conventional and unconventional fossil fuel resources</li> <li>- Moderate economic development based on GDP growth rates</li> <li>- Medium technological development directed toward environmentally friendly processes</li> <li>- Medium levels of land use change with a slow decline in deforestation rate</li> </ul> <p>Analytical choices were:</p> <ul style="list-style-type: none"> <li>- A time horizon of 2050</li> <li>- Use of RCP 4.5 and SSP2</li> </ul> <p>Primary impacts for the RCP4.5 scenario were evaluated relative to sea level rise, atmospheric CO<sub>2</sub> emissions and precipitation.</p>

**C3.2b**

**(C3.2b) Provide details of the focal questions your organization seeks to address by using climate-related scenario analysis, and summarize the results with respect to these questions.**

**Row 1**

**Focal questions**

Air Products has used scenario analysis to develop an understanding of how climate-related risks and opportunities might affect our businesses. Focal questions for the scenarios included:

Transition risks

1. How could climate change affect the major markets we serve?
2. How might increasing regulations impact our product sales and costs?
3. What technological opportunities might arise due to climate change?
4. How could climate change risks impact the perception of our Company by employees, customers and investors?

Physical risks

5. How could climate change risks impact our existing operating facilities and decisions regarding future projects?
6. What are the most significant operational impacts of climate change and where and when might they occur?
7. How could climate change risks impact our value chain?

**Results of the climate-related scenario analysis with respect to the focal questions**

Below are results corresponding to the focal questions.

1. Air Products serves over 30 industries. While all these industries will be impacted by climate change, those with the most significant potential for impact include automotive, bioenergy, cement, chemicals, electronics, food, hydrogen energy, hydrogen for mobility, liquefied natural gas, metals, oil and gas and power. These impacts may be detrimental and lead to product deselection, or the changes may provide opportunities that increase our customers' use of our gases, including zero- and low-carbon hydrogen for decarbonization and transportation.
2. Some of our operations are within jurisdictions that have or are developing regulatory regimes governing emissions of GHGs. Any legislation that limits or taxes GHG emissions could negatively impact our growth, increase our operating costs, or reduce demand for certain of our products. Regulatory changes can also create business opportunities as we help our customers improve energy efficiency and reduce environmental impact.
3. Given developing laws, market pressures, commitments and opportunities, there will be increased demand for lower-carbon intensity energy and industrial gas products that will provide significant opportunities for hydrogen for mobility and energy transition, carbon capture technologies, and gasification, to positively impact climate change. This has contributed to Air Products deciding to commit \$11 billion to energy transition projects by 2025.
4. Industrial gases are used to make materials that go into our homes and businesses, cars and fuels, health care, food and more. Their use also helps companies in dozens of industries to improve yields, reduce energy consumption and lower emissions. However, the production of industrial gases is energy intensive and generates CO2. We have found that sharing the benefits of our products can help address reputational concerns but recognize that some stakeholders have restrictive approaches to these issues that could impact our reputation.
5. Our operations could be impacted by catastrophic weather events. Any such event could cause a serious business disruption that could affect our ability to produce and distribute products and possibly expose us to third-party liability claims. Any such occurrence could have a negative impact on our operations and financial results.
6. Sea level rise, atmospheric CO2 emissions and precipitation were identified as having the potential to impact our operations. For example, 23% of Air Products' facilities are located in areas that have high water stress and the stress is expected to increase in the majority of these areas according to the scenarios.
7. Catastrophic events could also impact our value chain, which could cause energy and raw materials to be unavailable to us, or our customers to be unable to purchase or accept our products and services. Any such occurrence could have a negative impact on our operations and financial results.

**C3.3**

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

	Have climate-related risks and opportunities influenced your strategy in this area?	Description of influence
Products and services	Yes	<p>How our strategy has been influenced by climate-related risks and opportunities and the time horizons covered:</p> <p>The increase in customer interest in improving energy efficiency, reducing carbon emissions and complying with new or emerging regulations creates business opportunities for Air Products. This interest has been increasing over the past several years and is expected to rise in the future, particularly as long-term CO2 goals are set. Therefore, the time horizons are short, medium and long-term.</p> <p>Most substantial strategic decision(s) that have been influenced by the climate-related risks and opportunities:</p> <p>Implementing carbon capture projects and building the hydrogen economy are two strategic ways to reduce carbon emissions. We have built a strategic organization focused on developing and winning large-scale CO2 capture and related technology projects. We have also announced significant investments in hydrogen production that will enable the reduction of transportation emissions.</p> <p>Discussion</p> <p>At Air Products, sustainability creates our growth opportunities, and our growth opportunities support our sustainability goals and focus. We are focused on serving energy, environmental and emerging markets, all of which are important considerations for sustainability and climate change.</p> <p>Our products enable our customers to be more productive and efficient – to make more with less while reducing their impact on the environment. In 2022, our products enabled our customers and their customers to avoid the equivalent of 86 million metric tons of carbon dioxide emissions. This figure is more than three times our own direct and indirect CO2e emissions.</p> <p>Over the past five years there has been a shift in customer interest in sustainability as customers have increased their commitments to improve energy efficiency, reduce environmental impact and comply with new environmental requirements. These shifts create new opportunities for our products and technologies. One example is the increased interest in carbon capture technologies, which our team is pursuing particularly in the Americas and Europe. Likewise, we are increasing our strategic investments in hydrogen for mobility as demonstrated by our green and blue hydrogen projects in Saudi Arabia, Canada and the U.S.</p>

	Have climate-related risks and opportunities influenced your strategy in this area?	Description of influence
Supply chain and/or value chain	Yes	<p>How our strategy has been influenced by climate-related risks and opportunities and the time horizons covered:</p> <p>Industrial gas manufacturing is energy intensive. To reduce our exposure to potential risks related to the energy we purchase we have reduced the emissions intensity of our products, increased our sources of renewable energy and instituted contractual clauses to address energy cost increases due to climate regulations. These actions have been taken over the past several years and will continue in the short, medium and long-term.</p> <p>Most substantial strategic decision(s) that have been influenced by the climate-related risks and opportunities:</p> <p>Over the past several years we have increased the percentage of renewable electricity used, particularly in Europe and the U.S., and implemented several projects to produce renewable electricity.</p> <p>Discussion Energy is the primary raw material purchased to manufacture industrial gases, particularly electricity and steam for our air separation units and natural gas for our hydrogen plants. Because our industrial gas facilities use substantial amounts of energy, a disruption in the supply of energy, components, or raw materials, whether due to market conditions, legislative or regulatory actions, natural events, or other disruption, could prevent us from meeting our contractual commitments and harm our business and financial results.</p> <p>We look for opportunities to work with our suppliers on renewable energy. Air Products increased its percentage of renewable energy use in 2022 to 29%, an increase of 7% compared to the prior year, as we continued our journey to identify green energy sources that can reduce our energy costs and environmental footprint. We purchase renewable electricity directly through our energy suppliers or by buying Renewable Energy Certificates (RECs) that link our power consumption to a specific asset that generates renewable electricity. We have worked with suppliers to install solar arrays at several of our production and office facilities, generating electricity for internal consumption.</p>
Investment in R&D	Yes	<p>How our strategy has been influenced by climate-related risks and opportunities and the time horizons covered:</p> <p>The world faces a huge challenge in making the shift towards clean, sustainable energy sources. This shift presents opportunities for Air Products to build on its product and technology portfolio and develop new offerings today, tomorrow and for the future. The time horizons for these efforts are short, medium and long-term depending on the R&amp;D efforts underway.</p> <p>Most substantial strategic decision(s) that have been influenced by the climate-related risks and opportunities:</p> <p>In 2021 and 2022, we announced multi-billion dollar investments in projects to produce and deliver zero- and low-carbon hydrogen to drive decarbonization of heavy transportation and industrial sectors that are hard to electrify.</p> <p>Discussion Our research groups are aligned with our businesses and focus on improving our processes and helping our customers. In 2022, nearly 70% of our R&amp;D budget of \$102.9 million supported products and processes that are enabling zero- and low-carbon energy, improving energy efficiency and/or benefitting the environment.</p> <p>In 2022, Air Products continued to increase its focus on three key innovation areas that are also opportunities to enhance the sustainability of our customers:</p> <p>Hydrogen and the Energy Transition As the world's largest hydrogen producer, we are an important contributor to bringing hydrogen to scale on the way to a clean energy future. We are increasing our production of lower-carbon hydrogen and investing in new, clean hydrogen solutions for our customers.</p> <p>Carbon Capture Carbon capture is a high-impact opportunity to help tackle climate change and will be essential to meet the Paris climate goals. We see significant opportunities to capture CO2 from gasifiers and hydrogen plants for use in sequestration, enhanced oil recovery and productive use of CO2. Likewise, we continue to explore new possible end uses for captured carbon, supporting a more circular economy.</p> <p>Gasification Countries and large companies around the world continue to look at gasification as a way to use abundant natural resources to make synthetic gas. Gasification also provides a solution for refineries that need to find a use for high sulfur bottom-of-the-barrel liquids that can no longer be used as fuel for ships, and for petroleum coke.</p>
Operations	Yes	<p>How our strategy has been influenced by climate-related risks and opportunities and the time horizons covered:</p> <p>Industrial gas manufacturing is energy intensive. To reduce our exposure to potential risks related to the energy we purchase we have reduced the emissions intensity of our products through efficiency improvements and energy/emissions reduction goals. The time horizons for these efforts are short, medium and long-term as we strive to improve efficiency year over year and have set a goal to reduce our CO2 emissions intensity, which is directly related to energy consumption, and has a 2030 target date.</p> <p>Most substantial strategic decision(s) that have been influenced by the climate-related risks and opportunities:</p> <p>We established our "Third by '30" CO2 intensity reduction goal to reduce our CO2 emissions intensity by one-third by the year 2030 from a 2015 baseline. We plan to deliver on our CO2 intensity reduction goal through five mechanisms: executing carbon capture projects, producing carbon free hydrogen, executing low-carbon projects, continuing to improve our operations, and increasing our use of renewable energy.</p> <p>Discussion Industrial gas manufacturing is energy intensive. We carefully track and manage energy purchases, and our conservation programs are focused on continually improving energy efficiency across our plants, particularly larger facilities. We have a goal to reduce CO2 emissions intensity.</p> <p>We have continued our efforts to modernize our fleets with new, more efficient trucks that have increased fuel efficiencies. Distribution efficiency has also been improved through the addition of trailers with higher payloads. In 2022, we began converting our own fleet to run on hydrogen and partnered with Cummins, Inc. on the equipment.</p>

C3.4

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

	Financial planning elements that have been influenced	Description of influence
Row 1	Revenues Direct costs Capital expenditures	<p>Our business strategy focuses on creating value in the markets we serve, particularly energy, environmental and emerging markets. Our business planning process is completed annually for each fiscal year. The process considers growth opportunities, including those related to climate change and the energy transition, as well as climate risk management through energy efficiency and GHG emissions reduction efforts. Below are some examples of these considerations.</p> <p><b>Revenues</b> Air Products' sustainable offerings are products that improve energy efficiency, reduce environmental impact, and/or address a societal need. Each year we examine our revenues related to our sustainable offerings, which represented 56% of our revenues in 2022. As we look forward, we see significant opportunities for hydrogen for mobility and the transition to a low carbon economy, carbon capture technologies, and gasification in the medium and long-term. Potential revenues for these businesses have been considered in our financial planning, however the details are confidential.</p> <p><b>Direct Costs</b> GHG emissions from industrial gas manufacturing are driven by energy consumption. Air separation units require electricity or steam to compress air so it can be cryogenically distilled into oxygen, nitrogen and argon. Likewise, the production of hydrogen consumes hydrocarbons as a feedstock and/or fuel in the production process. Energy consumption is the most significant variable cost of Air Products' operations, and we carefully track and manage energy purchases. Our conservation programs are focused on continually improving energy efficiency across our plants to reduce energy consumption and GHG emissions. Each year as part of our business planning cycle the efficiencies of our operations are examined, and business objectives are set to improve energy efficiency. Our efforts in this area are focused on the short and medium-term.</p> <p><b>Capital Expenditures</b> Capital expenditures is the area in which we currently see the most impact of climate change on our financial planning. This is due to our multi-billion dollar investments in zero- and low-carbon hydrogen projects that will help the world transition to cleaner energy sources. These medium and long term projects include:</p> <p>Our landmark hydrogen energy complex in Alberta, Canada that includes a transformative net-zero hydrogen production and liquefaction facility. Air Products will deploy advanced hydrogen technology and an innovative design to deliver net-zero emissions. The new facility will capture over 95 percent of the CO<sub>2</sub> from the feedstock natural gas and store it safely back underground. Hydrogen-fueled electricity will offset the remaining five percent of emissions. The clean energy complex will help refining and petrochemical customers served by the Air Products Heartland Hydrogen Pipeline to reduce their carbon intensity. The complex also marks a first in the wider use of hydrogen in Alberta, enabling the production of liquid hydrogen to be an emissions-free fuel in the transportation sector, and to generate clean electricity. This facility will make Alberta a leading supplier of liquid hydrogen to western Canada and the Pacific Northwest of the United States, with enough liquid hydrogen capacity to fuel every public transit agency across Alberta.</p> <p>Air Products' \$4.5 billion (USD) investment to build, own and operate a clean energy complex that will produce over 750 million standard cubic feet per day of blue hydrogen in Louisiana. A portion of the blue hydrogen will be compressed and supplied to customers by our U.S. Gulf Coast hydrogen pipeline network – the world's largest. The balance will be used to make blue ammonia that will be transported around the globe and converted back to blue hydrogen for transportation and other markets. This megaproject will also capture and permanently sequester over five million metric tons per year of CO<sub>2</sub>, making it the largest carbon capture for sequestration facility in the world. Numerous studies have shown that Louisiana's geology is among the best in the world for permanent geologic sequestration.</p> <p>Our multi-billion dollar investment in NEOM, a new model for sustainable living located in Saudi Arabia and site of our transformative and innovative project that represents a massive change in how the world gets its energy for mobility, specifically carbon-free hydrogen to power buses and trucks around the world. The joint venture project with NEOM and ACWA Power is based on proven, world-class technology and will include: the integration of around four gigawatts of renewable power through solar, wind and storage; production of 650 tons per day of hydrogen by electrolysis; production of nitrogen by air separation using Air Products' technology; and production of 1.2 million tons per year of carbon-free ammonia using Haldor Topsoe technology through Air Products' global alliance agreement. Air Products will be the exclusive of-taker of the green ammonia and plans to invest in downstream facilities to dissociate the ammonia to hydrogen for use in the transportation market.</p>

**C3.5**

**(C3.5) In your organization's financial accounting, do you identify spending/revenue that is aligned with your organization's climate transition?**

	Identification of spending/revenue that is aligned with your organization's climate transition	Indicate the level at which you identify the alignment of your spending/revenue with a sustainable finance taxonomy
Row 1	No, but we plan to in the next two years	<Not Applicable>

**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

**Is this a science-based target?**

No, but we anticipate setting one in the next two years

**Target ambition**

<Not Applicable>

**Year target was set**

2020

**Target coverage**

Company-wide

**Scope(s)**

Scope 1

Scope 2

**Scope 2 accounting method**

Location-based

**Scope 3 category(ies)**

<Not Applicable>

**Intensity metric**

Other, please specify (CO2 intensity is the total Scope 1 and 2 CO2e emissions (measured in kilograms (kg) CO2e) divided by to the amount of energy equivalents produced at the same facilities and calendar year (measured in millions of British Thermal Units (MM BTUs)).)

**Base year**

2015

**Intensity figure in base year for Scope 1 (metric tons CO2e per unit of activity)**

0.056

**Intensity figure in base year for Scope 2 (metric tons CO2e per unit of activity)**

0.036

**Intensity figure in base year for Scope 3, Category 1: Purchased goods and services (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 2: Capital goods (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 4: Upstream transportation and distribution (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 5: Waste generated in operations (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 6: Business travel (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 7: Employee commuting (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 8: Upstream leased assets (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 9: Downstream transportation and distribution (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 10: Processing of sold products (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 11: Use of sold products (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 12: End-of-life treatment of sold products (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 13: Downstream leased assets (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 14: Franchises (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 15: Investments (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Other (upstream) (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Other (downstream) (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for total Scope 3 (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for all selected Scopes (metric tons CO2e per unit of activity)**

0.092

**% of total base year emissions in Scope 1 covered by this Scope 1 intensity figure**

100

**% of total base year emissions in Scope 2 covered by this Scope 2 intensity figure**

100

**% of total base year emissions in Scope 3, Category 1: Purchased goods and services covered by this Scope 3, Category 1: Purchased goods and services intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 2: Capital goods covered by this Scope 3, Category 2: Capital goods intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) covered by this Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 4: Upstream transportation and distribution covered by this Scope 3, Category 4: Upstream transportation and distribution intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 5: Waste generated in operations covered by this Scope 3, Category 5: Waste generated in operations intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 6: Business travel covered by this Scope 3, Category 6: Business travel intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 7: Employee commuting covered by this Scope 3, Category 7: Employee commuting intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 8: Upstream leased assets covered by this Scope 3, Category 8: Upstream leased assets intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 9: Downstream transportation and distribution covered by this Scope 3, Category 9: Downstream transportation and distribution intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 10: Processing of sold products covered by this Scope 3, Category 10: Processing of sold products intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 11: Use of sold products covered by this Scope 3, Category 11: Use of sold products intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 12: End-of-life treatment of sold products covered by this Scope 3, Category 12: End-of-life treatment of sold products intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 13: Downstream leased assets covered by this Scope 3, Category 13: Downstream leased assets intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 14: Franchises covered by this Scope 3, Category 14: Franchises intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 15: Investments covered by this Scope 3, Category 15: Investments intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Other (upstream) covered by this Scope 3, Other (upstream) intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Other (downstream) covered by this Scope 3, Other (downstream) intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3 (in all Scope 3 categories) covered by this total Scope 3 intensity figure**

<Not Applicable>

**% of total base year emissions in all selected Scopes covered by this intensity figure**

100

**Target year**

2030

**Targeted reduction from base year (%)**

33

**Intensity figure in target year for all selected Scopes (metric tons CO2e per unit of activity) [auto-calculated]**

0.06164

**% change anticipated in absolute Scope 1+2 emissions**

0

**% change anticipated in absolute Scope 3 emissions**

0

**Intensity figure in reporting year for Scope 1 (metric tons CO2e per unit of activity)**

0.055

**Intensity figure in reporting year for Scope 2 (metric tons CO2e per unit of activity)**

0.032

**Intensity figure in reporting year for Scope 3, Category 1: Purchased goods and services (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 2: Capital goods (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 4: Upstream transportation and distribution (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 5: Waste generated in operations (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 6: Business travel (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 7: Employee commuting (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 8: Upstream leased assets (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 9: Downstream transportation and distribution (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 10: Processing of sold products (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 11: Use of sold products (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 12: End-of-life treatment of sold products (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 13: Downstream leased assets (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 14: Franchises (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 15: Investments (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Other (upstream) (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Other (downstream) (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for total Scope 3 (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for all selected Scopes (metric tons CO2e per unit of activity)**

0.087

**Does this target cover any land-related emissions?**

No, it does not cover any land-related emissions (e.g. non-FLAG SBT)

**% of target achieved relative to base year [auto-calculated]**

16.4690382081687

**Target status in reporting year**

Underway

**Please explain target coverage and identify any exclusions**

Through our "Third by '30" CO2 intensity reduction goal we aim to reduce our Scope 1 and 2 CO2 emissions intensity by one-third by the year 2030 from a 2015 baseline. The goal is fully aligned with our business strategy, is near-term and measurable. We plan to deliver on our CO2 intensity reduction goal through five mechanisms: executing carbon capture projects, producing carbon free hydrogen, executing low-carbon projects, continuing to improve our operations, and increasing our use of renewable energy. We expect to see significant improvement in this metric later in the decade as key low- and zero-carbon hydrogen projects come onstream.

CO2 intensity is our total Scope 1 and 2 CO2e emissions divided by the amount of energy equivalents produced at the same facilities over the same calendar year. The CO2 emissions are measured in kilograms and the energy equivalents in million (MM) British Thermal Units (BTUs):

CO2 Intensity = (Scope 1 + Scope 2) (kg CO2e) / Energy Equivalents (MM BTU)

Scope 1 and Scope 2 intensities are provided above for completeness, but the numerator of goal is the combination of the two scopes.

**Plan for achieving target, and progress made to the end of the reporting year**

We plan to deliver on our CO2 intensity reduction goal through five mechanisms:

executing carbon capture projects, producing carbon-free hydrogen, executing low-carbon projects, continuing to improve our operations, and increasing our use of renewable energy. In 2022, we have announced several zero- and low-carbon hydrogen projects that will support this goal, including:

- A new green hydrogen facility in Casa Grande, Arizona, U.S. that will produce 10 tonnes of liquid hydrogen per day for the mobility market
- A second hydrogen liquefaction plant in Rotterdam, The Netherlands that will produce hydrogen for the mobility market
- A new green hydrogen facility in New York, U.S. that will produce 35 tonnes of liquid hydrogen per day for the mobility and industrial markets

In addition, we continued to work on major projects announced in 2021, including:

- Our landmark hydrogen energy complex in Alberta, Canada that includes a transformative net-zero hydrogen production and liquefaction facility.
- Our \$4.5 billion (USD) investment to build, own and operate a clean energy complex in Louisiana that will produce over 750 million standard cubic feet per day of blue hydrogen for transportation and other markets and also capture and permanently sequester over five million metric tons per year of CO2, making it the largest carbon capture for sequestration facility in the world.
- Our multi-billion dollar investment in NEOM, Saudi Arabia that will make green ammonia that will be transported around the world and dissociated to produce green hydrogen for the transportation market with the potential to eliminate three million tons per year of CO2 emissions as well as smog-forming emissions and other pollutants from the equivalent of over 700,000 cars.



The initiatives that have contributed the most to this target to date include improving energy efficiency, increasing our use of renewable electricity. We expect to see significant improvement in this metric later in the decade as key low- and zero-carbon hydrogen projects come onstream.

**List the emissions reduction initiatives which contributed most to achieving this target**

<Not Applicable>

---

**Target reference number**

Int 2

**Is this a science-based target?**

No, but we anticipate setting one in the next two years

**Target ambition**

<Not Applicable>

**Year target was set**

2022

**Target coverage**

Company-wide

**Scope(s)**

Scope 3

**Scope 2 accounting method**

<Not Applicable>

**Scope 3 category(ies)**

Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)

Category 11: Use of sold products

Category 15: Investments

**Intensity metric**

Other, please specify (CO2 intensity is the total Scope 1 and 2 CO2e emissions (measured in kilograms (kg) CO2e) divided by the amount of energy equivalents produced at the same facilities and calendar year (measured in millions of British Thermal Units (MM BTUs)).)

**Base year**

2015

**Intensity figure in base year for Scope 1 (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 2 (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 1: Purchased goods and services (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 2: Capital goods (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) (metric tons CO2e per unit of activity)**

0.0153

**Intensity figure in base year for Scope 3, Category 4: Upstream transportation and distribution (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 5: Waste generated in operations (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 6: Business travel (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 7: Employee commuting (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 8: Upstream leased assets (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 9: Downstream transportation and distribution (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 10: Processing of sold products (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 11: Use of sold products (metric tons CO2e per unit of activity)**

0.0131

**Intensity figure in base year for Scope 3, Category 12: End-of-life treatment of sold products (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 13: Downstream leased assets (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 14: Franchises (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Category 15: Investments (metric tons CO2e per unit of activity)**

0.0068

**Intensity figure in base year for Scope 3, Other (upstream) (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for Scope 3, Other (downstream) (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in base year for total Scope 3 (metric tons CO2e per unit of activity)**

0.035

**Intensity figure in base year for all selected Scopes (metric tons CO2e per unit of activity)**

0.035

**% of total base year emissions in Scope 1 covered by this Scope 1 intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 2 covered by this Scope 2 intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 1: Purchased goods and services covered by this Scope 3, Category 1: Purchased goods and services intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 2: Capital goods covered by this Scope 3, Category 2: Capital goods intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) covered by this Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) intensity figure**

100

**% of total base year emissions in Scope 3, Category 4: Upstream transportation and distribution covered by this Scope 3, Category 4: Upstream transportation and distribution intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 5: Waste generated in operations covered by this Scope 3, Category 5: Waste generated in operations intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 6: Business travel covered by this Scope 3, Category 6: Business travel intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 7: Employee commuting covered by this Scope 3, Category 7: Employee commuting intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 8: Upstream leased assets covered by this Scope 3, Category 8: Upstream leased assets intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 9: Downstream transportation and distribution covered by this Scope 3, Category 9: Downstream transportation and distribution intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 10: Processing of sold products covered by this Scope 3, Category 10: Processing of sold products intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 11: Use of sold products covered by this Scope 3, Category 11: Use of sold products intensity figure**

100

**% of total base year emissions in Scope 3, Category 12: End-of-life treatment of sold products covered by this Scope 3, Category 12: End-of-life treatment of sold products intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 13: Downstream leased assets covered by this Scope 3, Category 13: Downstream leased assets intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 14: Franchises covered by this Scope 3, Category 14: Franchises intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Category 15: Investments covered by this Scope 3, Category 15: Investments intensity figure**

100

**% of total base year emissions in Scope 3, Other (upstream) covered by this Scope 3, Other (upstream) intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3, Other (downstream) covered by this Scope 3, Other (downstream) intensity figure**

<Not Applicable>

**% of total base year emissions in Scope 3 (in all Scope 3 categories) covered by this total Scope 3 intensity figure**

100

**% of total base year emissions in all selected Scopes covered by this intensity figure**

100

**Target year**

2030

**Targeted reduction from base year (%)**

33.33

**Intensity figure in target year for all selected Scopes (metric tons CO2e per unit of activity) [auto-calculated]**

0.0233345

**% change anticipated in absolute Scope 1+2 emissions**

10

**% change anticipated in absolute Scope 3 emissions**

10

**Intensity figure in reporting year for Scope 1 (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 2 (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 1: Purchased goods and services (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 2: Capital goods (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) (metric tons CO2e per unit of activity)**

0,01

**Intensity figure in reporting year for Scope 3, Category 4: Upstream transportation and distribution (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 5: Waste generated in operations (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 6: Business travel (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 7: Employee commuting (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 8: Upstream leased assets (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 9: Downstream transportation and distribution (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 10: Processing of sold products (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 11: Use of sold products (metric tons CO2e per unit of activity)**

0,0095

**Intensity figure in reporting year for Scope 3, Category 12: End-of-life treatment of sold products (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 13: Downstream leased assets (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 14: Franchises (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Category 15: Investments (metric tons CO2e per unit of activity)**

0,0058

**Intensity figure in reporting year for Scope 3, Other (upstream) (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for Scope 3, Other (downstream) (metric tons CO2e per unit of activity)**

<Not Applicable>

**Intensity figure in reporting year for total Scope 3 (metric tons CO2e per unit of activity)**

0,025

**Intensity figure in reporting year for all selected Scopes (metric tons CO2e per unit of activity)**

0,025

**Does this target cover any land-related emissions?**

No, it does not cover any land-related emissions (e.g. non-FLAG SBT)

**% of target achieved relative to base year [auto-calculated]**

85.7228580000857

**Target status in reporting year**

Underway

**Please explain target coverage and identify any exclusions**

Through our "Third by '30" CO2 intensity reduction goal we aim to reduce our Scope 3 CO2 emissions intensity by one-third by the year 2030 from a 2015 baseline. The goal is fully aligned with our business strategy, is near-term and measurable. We plan to deliver on our CO2 intensity reduction goal by: executing carbon capture projects, producing carbon free hydrogen, executing low-carbon projects, continuing to improve our operations, increasing our use of renewable energy, and reducing our sales of certain products. CO2 intensity is our total Scope 3 CO2e emissions across three categories divided by the amount of energy equivalents produced at the same facilities over the same calendar year. The CO2 emissions are measured in kilograms and the energy equivalents in million (MM) British Thermal Units (BTUs):

$$\text{CO2 Intensity} = (\text{Scope 3 Category 3} + \text{Scope 3 Category 11} + \text{Scope 3 Category 15}) \text{ (kg CO2e)} / \text{Energy Equivalents (MM BTU)}$$

Scope 3 Category 3, Scope 3 Category 11, and Scope 3 Category 15 intensities are provided above for completeness, but the numerator of goal is the combination of the three categories.

**Plan for achieving target, and progress made to the end of the reporting year**

We plan to deliver on our CO2 intensity reduction goal through five mechanisms:

executing carbon capture projects, producing carbon-free hydrogen, executing low-carbon projects, continuing to improve our operations, increasing our use of renewable energy, and reducing our sales of certain products.

In 2022 we announced several zero- and low-carbon hydrogen projects that will support this goal, including:

- A new green hydrogen facility in Casa Grande, Arizona, U.S. that will produce 10 tonnes of liquid hydrogen per day for the mobility market
- A second hydrogen liquefaction plant in Rotterdam, The Netherlands that will produce hydrogen for the mobility market
- A new green hydrogen facility in New York, U.S. that will produce 35 tonnes of liquid hydrogen per day for the mobility and industrial markets

In addition, we continued to work on major projects announced in 2021, including:

- Our landmark hydrogen energy complex in Alberta, Canada that includes a transformative net-zero hydrogen production and liquefaction facility.
- Our \$4.5 billion (USD) investment to build, own and operate a clean energy complex in Louisiana that will produce over 750 million standard cubic feet per day of blue hydrogen for transportation and other markets and also capture and permanently sequester over five million metric tons per year of CO2, making it the largest carbon capture for sequestration facility in the world.
- Our multi-billion dollar investment in NEOM, Saudi Arabia that will make green ammonia that will be transported around the world and dissociated to produce green hydrogen for the transportation market with the potential to eliminate three million tons per year of CO2 emissions as well as smog-forming emissions and other pollutants from the equivalent of over 700,000 cars.

**List the emissions reduction initiatives which contributed most to achieving this target**

<Not Applicable>

**C4.2**

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

No other climate-related targets

**C4.3**

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

Yes

**C4.3a**

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

	Number of initiatives	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	0	0
To be implemented*	0	0
Implementation commenced*	35	235000
Implemented*	30	200000
Not to be implemented	0	0

**C4.3b**

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

**Initiative category & Initiative type**

Energy efficiency in production processes	Process optimization
---	----------------------

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

53000

**Scope(s) or Scope 3 category(ies) where emissions savings occur**

Scope 2 (location-based)

**Voluntary/Mandatory**

Voluntary

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

2800000

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

350000

**Payback period**

<1 year

**Estimated lifetime of the initiative**

Ongoing

**Comment**

Each year, Air Products undertakes improvement projects to increase energy efficiency and reduce CO2 emissions. These projects are tracked in a database that includes active and completed projects by year. The database does not include projects under investigation, to be implemented or not to be implemented. Emissions are estimated by multiplying energy savings due to efficiency improvements by relevant emissions factors. In 2022, the energy efficiency projects supported Air Products' "Third by '30" CO2 emissions intensity reduction goal that is aimed at reducing the Company's CO2 emissions intensity by one-third by 2030 from a 2015 baseline. The estimated lifetime of the initiatives is ongoing because process changes, such as the optimization of energy efficiency, are maintained until they are re-evaluated.

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**Initiative category & Initiative type**

Transportation	Company fleet vehicle efficiency
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**Estimated annual CO2e savings (metric tonnes CO2e)**

91000

**Scope(s) or Scope 3 category(ies) where emissions savings occur**

Scope 1

**Voluntary/Mandatory**

Voluntary

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

12500000

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

400000

**Payback period**

<1 year

**Estimated lifetime of the initiative**

Ongoing

**Comment**

Each year, Air Products undertakes improvement projects to increase energy efficiency and reduce CO2 emissions. These projects are tracked in a database that includes active and completed projects by year. The database does not include projects under investigation, to be implemented or not to be implemented. Emissions are estimated by multiplying energy savings due to efficiency improvements by relevant emissions factors. In 2022, the energy efficiency projects supported Air Products' "Third by '30" CO2 emissions intensity reduction goal that is aimed at reducing the Company's CO2 emissions intensity by one-third by 2030 from a 2015 baseline. The estimated lifetime of the initiatives is ongoing because process changes, such as the optimization of energy efficiency, are maintained until they are re-evaluated.

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**Initiative category & Initiative type**

Non-energy industrial process emissions reductions	Process material efficiency
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**Estimated annual CO2e savings (metric tonnes CO2e)**

56000

**Scope(s) or Scope 3 category(ies) where emissions savings occur**

Scope 2 (location-based)

**Voluntary/Mandatory**

Voluntary

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

6400000

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

680000

**Payback period**

1-3 years

**Estimated lifetime of the initiative**

Ongoing

**Comment**

Each year, Air Products undertakes improvement projects to increase energy efficiency and reduce CO2 emissions. These projects are tracked in a database that includes active and completed projects by year. The database does not include projects under investigation, to be implemented or not to be implemented. Emissions are estimated by multiplying energy savings due to efficiency improvements by relevant emissions factors. In 2022, the energy efficiency projects supported Air Products' "Third by '30" CO2 emissions intensity reduction goal that is aimed at reducing the Company's CO2 emissions intensity by one-third by 2030 from a 2015 baseline. The estimated lifetime of the initiatives is ongoing because process changes, such as the optimization of energy efficiency, are maintained until they are re-evaluated.

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C4.3c

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

Method	Comment
Compliance with regulatory requirements/standards	Regulatory risks are managed at the regional level as regulations vary by jurisdiction. Regional experts assess the risks and work with potentially impacted businesses to address them.
Employee engagement	Air Products has a robust productivity improvement process. Employee recommendations to improve productivity frequently focus on energy conservation and emissions reduction projects. These ideas are tracked in a global, central database that includes quantified costs and benefits. Data from this system was used to respond to previous questions (C4.3a and C4.3b).
Internal incentives/recognition programs	Employees are recognized for progress against achieving our climate change objectives, developing new commercial offerings that yield cost-effective solutions to our customers' GHG emission reduction needs and bringing such solutions to the marketplace, and implementing effective work processes to compile the GHG inventory and satisfy regulatory compliance and reporting requirements. Efforts are recognized through existing compensation and awards programs, such as our Chairman's Environmental, Health and Safety Awards.
Partnering with governments on technology development	Air Products seeks opportunities to collaborate with governments on technology developments. For example, the Company has employed novel CO2 capture technology for one of the largest carbon capture and storage demonstration projects in the world by working with the U.S. Department of Energy.

**C4.5**

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**(C4.5) Do you classify any of your existing goods and/or services as low-carbon products?**

Yes

**C4.5a**

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**(C4.5a) Provide details of your products and/or services that you classify as low-carbon products.**

**Level of aggregation**

Product or service

**Taxonomy used to classify product(s) or service(s) as low-carbon**

No taxonomy used to classify product(s) or service(s) as low carbon

**Type of product(s) or service(s)**

Hydrogen	Other, please specify (Low-carbon hydrogen produced by steam methane reforming with carbon capture)
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**Description of product(s) or service(s)**

Air Products produces low-carbon hydrogen in Port Arthur, Texas, where we operate the largest CO2 purification and capture project for enhanced oil recovery (EOR) by an industrial gas company. Air Products designed, constructed and operates the state-of-the-art system to capture CO2 from two steam methane reformers (SMRs). The CO2 removal technology was retrofitted to the SMRs, which produce hydrogen to assist in the making of cleaner burning transportation fuels by refinery customers on Air Products' Gulf Coast hydrogen pipeline network. Since 2013, when it initiated onstream capture operations, Air Products has captured nearly one million tons per year of CO2 at Port Arthur that has been put to beneficial use.

**Have you estimated the avoided emissions of this low-carbon product(s) or service(s)**

Yes

**Methodology used to calculate avoided emissions**

Other, please specify (Calculations are based on guidance and factors from the California Air Resources Board (CARB) and the Low Carbon Fuel Standard (LCFS) Regulation)

**Life cycle stage(s) covered for the low-carbon product(s) or services(s)**

Cradle-to-grave

**Functional unit used**

Metric tonnes of hydrogen

**Reference product/service or baseline scenario used**

Truck or bus transportation using diesel fuel

**Life cycle stage(s) covered for the reference product/service or baseline scenario**

Cradle-to-grave

**Estimated avoided emissions (metric tons CO2e per functional unit) compared to reference product/service or baseline scenario**

16

**Explain your calculation of avoided emissions, including any assumptions**

Assumptions:

The calculations use factors from the California Air Resources Board (CARB) and Low Carbon Fuel Standard (LCFS) with the exception of the carbon intensity (CI) for hydrogen that has been estimated by Air Products.

Basis of calculations:

Estimated avoided emissions represent the difference in transportation CO2e emissions when using hydrogen (H2) in a fuel cell electric vehicle (FCEV) compared to diesel used in an internal combustion engine using diesel. Emissions depend on each fuels' carbon intensity (CI), fuel energy density (FED) and fuel efficiency (FE).

Calculations:

Emissions avoided in kg CO2e per kg of hydrogen =

$$[(CI \text{ diesel} \times FED \text{ diesel}) / (FE \text{ diesel} \times 1000 \text{ g/kg})] - (CI \text{ H2} \times FED \text{ H2}) / (FE \text{ H2} \times 1000 \text{ g/kg}) \times FE \text{ H2}$$

Where

CI diesel = 100.45 gCO2e/MJ

FED diesel = 134.47 MJ/gal

FE diesel = 4.24 mpg for buses and 6.4 mpg for trucks

CI H2 = 40 gCO2e/MJ

FED H2 = 120 MJ/kg

FE H2 = 7.2 mi/kg for buses and 10.9 mi/kg for trucks

Note that the math shown results in a value in kg CO2e per kg hydrogen which is the same value for MT CO2e per MT hydrogen.

In addition, please note the revenue generated through sales of this hydrogen is Company confidential so a value of 1% has been included in the box below.

**Revenue generated from low-carbon product(s) or service(s) as % of total revenue in the reporting year**

1

**C5. Emissions methodology**

**C5.1**

**(C5.1) Is this your first year of reporting emissions data to CDP?**

No

C5.1a

(C5.1a) Has your organization undergone any structural changes in the reporting year, or are any previous structural changes being accounted for in this disclosure of emissions data?

Row 1

Has there been a structural change?

Yes, an acquisition  
No

Name of organization(s) acquired, divested from, or merged with

PBF

Details of structural change(s), including completion dates

Five steam methane reforming facilities were acquired from PBF. These facilities came under full operational control of Air Products during the 2022 calendar year and are reflected in greenhouse gas emissions totals.

C5.1b

(C5.1b) Has your emissions accounting methodology, boundary, and/or reporting year definition changed in the reporting year?

	Change(s) in methodology, boundary, and/or reporting year definition?	Details of methodology, boundary, and/or reporting year definition change(s)
Row 1	No	<Not Applicable>

C5.1c

(C5.1c) Have your organization's base year emissions and past years' emissions been recalculated as a result of any changes or errors reported in C5.1a and/or C5.1b?

	Base year recalculation	Scope(s) recalculated	Base year emissions recalculation policy, including significance threshold	Past years' recalculation
Row 1	Yes	Scope 1 Scope 2, location-based Scope 3	Emissions are restated and recalculated, when necessary, given significant acquisitions, divestitures, or other changes in reporting boundaries. The significance threshold requiring a restatement is a change in total emissions greater than 1% in any category.	Yes

C5.2

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

Scope 1

Base year start

January 1 2015

Base year end

December 31 2015

Base year emissions (metric tons CO2e)

16700000

Comment

These are the base year (2015), Scope 1 emissions used in Air Products' "Third by '30" CO2 intensity reduction goal.

Scope 2 (location-based)

Base year start

January 1 2015

Base year end

December 31 2015

Base year emissions (metric tons CO2e)

10300000

Comment

These are the base year (2015), Scope 2 (location based) emissions used in Air Products' "Third by '30" CO2 intensity reduction goal.



**Scope 2 (market-based)**

**Base year start**

January 1 2015

**Base year end**

December 31 2015

**Base year emissions (metric tons CO2e)**

0

**Comment**

Not applicable - Air Products does not report Scope 2, market-based

**Scope 3 category 1: Purchased goods and services**

**Base year start**

**Base year end**

**Base year emissions (metric tons CO2e)**

**Comment**

Not applicable - Air Products does not report Scope 3 category 1 because the emissions do not meet our materiality threshold.

**Scope 3 category 2: Capital goods**

**Base year start**

**Base year end**

**Base year emissions (metric tons CO2e)**

**Comment**

Not applicable - Air Products does not report Scope 3 category 2 because the emissions do not meet our materiality threshold.

**Scope 3 category 3: Fuel-and-energy-related activities (not included in Scope 1 or 2)**

**Base year start**

January 1 2015

**Base year end**

December 31 2015

**Base year emissions (metric tons CO2e)**

4470000

**Comment**

In 2022, Air Products established a "Third by '30" CO2 intensity goal for Scope 3. For this goal, CO2 intensity is defined as the total Scope 3 CO2e emissions for three categories (measured in kilograms (kg) CO2e) divided by the amount of energy equivalents produced at the same facilities and calendar year (measured in millions of British Thermal Units (MM BTUs)). The three Scope 3 categories for which emissions are totaled and included in the goal are Category 3: Fuel-and-energy-related activities (not included in Scope 1 or 2); Category 11: Use of sold products; and Category 15: Investments.

**Scope 3 category 4: Upstream transportation and distribution**

**Base year start**

**Base year end**

**Base year emissions (metric tons CO2e)**

**Comment**

Not applicable - Air Products does not report Scope 3 category 4 because the emissions do not meet our materiality threshold.

**Scope 3 category 5: Waste generated in operations**

**Base year start**

**Base year end**

**Base year emissions (metric tons CO2e)**

**Comment**

Not applicable - Air Products does not report Scope 3 category 5 because the emissions do not meet our materiality threshold.

**Scope 3 category 6: Business travel**

**Base year start**

**Base year end**

**Base year emissions (metric tons CO2e)**

**Comment**

Not applicable - Air Products does not report Scope 3 category 6 because the emissions do not meet our materiality threshold.

**Scope 3 category 7: Employee commuting**

**Base year start**

**Base year end**

**Base year emissions (metric tons CO2e)**

**Comment**

Not applicable - Air Products does not report Scope 3 category 7 because the emissions do not meet our materiality threshold.

**Scope 3 category 8: Upstream leased assets**

**Base year start**

**Base year end**

**Base year emissions (metric tons CO2e)**

**Comment**

Not applicable - Air Products does not report Scope 3 category 8 because the emissions do not meet our materiality threshold.

**Scope 3 category 9: Downstream transportation and distribution**

**Base year start**

**Base year end**

**Base year emissions (metric tons CO2e)**

**Comment**

Not applicable - Air Products does not report Scope 3 category 9 because the emissions do not meet our materiality threshold.

**Scope 3 category 10: Processing of sold products**

**Base year start**

**Base year end**

**Base year emissions (metric tons CO2e)**

**Comment**

Not applicable - Air Products does not report Scope 3 category 10 because our gases are consumed in our customers' processes and emissions from the processing of these products cannot be reliably estimated.

**Scope 3 category 11: Use of sold products**

**Base year start**

January 1 2015

**Base year end**

December 31 2015

**Base year emissions (metric tons CO2e)**

3820000

**Comment**

In 2022, Air Products established a "Third by '30" CO2 intensity goal for Scope 3. For this goal, CO2 intensity is defined as the total Scope 3 CO2e emissions for three categories (measured in kilograms (kg) CO2e) divided by the amount of energy equivalents produced at the same facilities and calendar year (measured in millions of British Thermal Units (MM BTUs)). The three Scope 3 categories for which emissions are totaled and included in the goal are Category 3: Fuel-and-energy-related activities (not included in Scope 1 or 2); Category 11: Use of sold products; and Category 15: Investments.

**Scope 3 category 12: End of life treatment of sold products**

**Base year start**

**Base year end**

**Base year emissions (metric tons CO2e)**

**Comment**

Not applicable - Air Products does not report Scope 3 category 12 because most gaseous products are fully consumed or incorporated into other products and do not require end of life treatment.

**Scope 3 category 13: Downstream leased assets**

**Base year start**

**Base year end**

**Base year emissions (metric tons CO2e)**

**Comment**

Not applicable - Air Products does not report Scope 3 category 13 because it does not have downstream leased assets.

**Scope 3 category 14: Franchises**

**Base year start**

**Base year end**

**Base year emissions (metric tons CO2e)**

**Comment**

Not applicable - Air Products does not report Scope 3 category 14 because it does not have franchises.

### Scope 3 category 15: Investments

**Base year start**

January 1 2015

**Base year end**

December 31 2015

**Base year emissions (metric tons CO2e)**

1980000

**Comment**

In 2022, Air Products established a "Third by '30" CO2 intensity goal for Scope 3. For this goal, CO2 intensity is defined as the total Scope 3 CO2e emissions for three categories (measured in kilograms (kg) CO2e) divided by to the amount of energy equivalents produced at the same facilities and calendar year (measured in millions of British Thermal Units (MM BTUs)). The three Scope 3 categories for which emissions are totaled and included in the goal are Category 3: Fuel-and-energy-related activities (not included in Scope 1 or 2); Category 11: Use of sold products; and Category 15: Investments.

### Scope 3: Other (upstream)

**Base year start****Base year end****Base year emissions (metric tons CO2e)****Comment**

Not applicable - Air Products does not have additional upstream Scope 3 emissions.

### Scope 3: Other (downstream)

**Base year start****Base year end****Base year emissions (metric tons CO2e)****Comment**

Not applicable - Air Products does not have additional downstream Scope 3 emissions.

## C5.3

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**(C5.3) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate emissions.**

China Corporate Energy Conservation and GHG Management Programme

European Union Emission Trading System (EU ETS): The Monitoring and Reporting Regulation (MMR) – General guidance for installations

IEA CO2 Emissions from Fuel Combustion

Korea GHG and Energy Target Management System Operating Guidelines

The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)

US EPA Mandatory Greenhouse Gas Reporting Rule

Other, please specify (US Environmentally-Extended Input-Output (USEEIO) Technical Content)

## C6. Emissions data

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### C6.1

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

16800000

**Start date**

<Not Applicable>

**End date**

<Not Applicable>

**Comment**

Natural gas consumption contributes the majority of our direct (Scope 1) emission along with insignificant contributions (less than 2% of gross global Scope 1 emissions) of transportation and fugitive losses from CO2 production.

In 2022, our gross global Scope 1 GHG emissions, which are primarily from our hydrogen/carbon monoxide (HyCO) operations totalling 16.8 million metric tons CO2e, representing a slight decrease of 0.59 percent from the prior year despite increased production.

### C6.2

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**(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 have operations where we are able to access electricity supplier emission factors or residual emissions factors, but are unable to report a Scope 2, market-based figure

**Comment**

Air Products does not report a market-based figure due to difficulties in acquiring reliable and accurate emissions factors in a timely manner.

**C6.3**

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

**Reporting year**

**Scope 2, location-based**

9700000

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

<Not Applicable>

**Start date**

<Not Applicable>

**End date**

<Not Applicable>

**Comment**

Electricity and steam consumption contributes to the majority of our indirect (Scope 2) emissions. In 2022, our gross global Scope 2 location-based GHG emissions, which are primarily from our Air Separation Units (ASUs), totaled 9.7 million metric tons of CO2e, representing a 2.1 percent increase from prior year as a result of organic growth in customer demand.

**C6.4**

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**(C6.4) Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1, Scope 2 or Scope 3 emissions that are within your selected reporting boundary which are not included in your disclosure?**

No

**C6.5**

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

**Purchased goods and services**

**Evaluation status**

Not relevant, explanation provided

**Emissions in reporting year (metric tons CO2e)**

<Not Applicable>

**Emissions calculation methodology**

<Not Applicable>

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

<Not Applicable>

**Please explain**

The principal raw materials for making atmospheric gases and hydrogen are air, electricity, steam and natural gas. Scope 3 emissions related to the electricity, steam and natural gas used as a fuel are covered below under category 3, fuel-and-energy related activities (not included in Scope 1 or 2).

Air Products has applied a 2% materiality threshold to its Scope 3 emissions for 2022. This threshold is 154,000 metric tons of CO2e. Emissions related to other goods and services purchased were estimated in prior years (2016 and earlier) and did not meet the 2% materiality threshold. As a result, the emissions are considered not relevant.

## Capital goods

### Evaluation status

Not relevant, explanation provided

### Emissions in reporting year (metric tons CO2e)

<Not Applicable>

### Emissions calculation methodology

<Not Applicable>

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

<Not Applicable>

### Please explain

Air Products has applied a 2% materiality threshold to its Scope 3 emissions for 2022.

This threshold is 154,000 metric tons of CO2e. Emissions related to capital goods purchased have been estimated in prior years (2016 and earlier) and did not meet the 2% materiality threshold. As a result, the emissions are considered not relevant.

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

### Evaluation status

Relevant, calculated

### Emissions in reporting year (metric tons CO2e)

3000000

### Emissions calculation methodology

Fuel-based method

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

100

### Please explain

Fuel consumption values were collected for each facility. Cradle-to-gate emissions factors were obtained from life-cycle assessment databases for each fuel type and applicable country or region. For each site, the amount of fuel consumed was multiplied by the fuel's cradle-to-gate emissions factor specific to the country or region to calculate the emissions. These emissions were subsequently summed to determine the site-level emissions.

Fuel usage was determined primarily from supplier invoices or invoice-quality data. The fuel and energy related emissions were subject to limited assurance by GHD Limited (See 2022 Greenhouse Gas Inventory Verification at <https://www.airproducts.com/-/media/files/en/sustainability/2022-greenhouse-gas-verification-statement.pdf>)

## Upstream transportation and distribution

### Evaluation status

Not relevant, explanation provided

### Emissions in reporting year (metric tons CO2e)

<Not Applicable>

### Emissions calculation methodology

<Not Applicable>

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

<Not Applicable>

### Please explain

The principal raw materials for making atmospheric gases and hydrogen are air, electricity, steam and natural gas. Distribution emissions related to electricity, steam and natural gas are included in category 3.

Air Products has applied a 2% materiality threshold to its Scope 3 emissions for 2022. This threshold is 154,000 metric tons of CO2e. Emissions related to upstream transportation and distribution for other materials have been estimated in prior years (2016 and earlier) and did not meet the 2% materiality threshold. As a result, the emissions are considered not relevant.

## Waste generated in operations

### Evaluation status

Not relevant, explanation provided

### Emissions in reporting year (metric tons CO2e)

<Not Applicable>

### Emissions calculation methodology

<Not Applicable>

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

<Not Applicable>

### Please explain

Air Products has applied a 2% materiality threshold to its Scope 3 emissions for 2022. This threshold is 154,000 metric tons of CO2e. Emissions related to waste have been estimated in prior years (2015 and earlier) and did not meet the 2% materiality threshold. As a result, the emissions are considered not relevant.

## Business travel

### Evaluation status

Not relevant, explanation provided

### Emissions in reporting year (metric tons CO2e)

<Not Applicable>

### Emissions calculation methodology

<Not Applicable>

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

<Not Applicable>

### Please explain

Air Products has applied a 2% materiality threshold to its Scope 3 emissions for 2022. This threshold is 154,000 metric tons of CO2e. Emissions related to business travel have been estimated in prior years (2018 and earlier) and did not meet the 2% materiality threshold. As a result, the emissions are considered not relevant.

## Employee commuting

### Evaluation status

Not relevant, explanation provided

### Emissions in reporting year (metric tons CO2e)

<Not Applicable>

### Emissions calculation methodology

<Not Applicable>

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

<Not Applicable>

### Please explain

Air Products has applied a 2% materiality threshold to its Scope 3 emissions for 2022. This threshold is 154,000 metric tons of CO2e. Emissions related to employee commuting have been estimated in prior years (2016 and earlier) and did not meet the 2% materiality threshold. As a result, the emissions are considered not relevant.

## Upstream leased assets

### Evaluation status

Not relevant, explanation provided

### Emissions in reporting year (metric tons CO2e)

<Not Applicable>

### Emissions calculation methodology

<Not Applicable>

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

<Not Applicable>

### Please explain

Air Products has applied a 2% materiality threshold to its Scope 3 emissions for 2022. This threshold is 154,000 metric tons of CO2e. Emissions related to upstream leased assets have been estimated in prior years (2015 and earlier) and did not meet the 2% materiality threshold. As a result, the emissions are considered not relevant.

## Downstream transportation and distribution

### Evaluation status

Not relevant, explanation provided

### Emissions in reporting year (metric tons CO2e)

<Not Applicable>

### Emissions calculation methodology

<Not Applicable>

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

<Not Applicable>

### Please explain

Emissions related to the distribution of company products using Air Products' fleet are included in our Scope 1 emissions. Air Products has applied a 2% materiality threshold to its Scope 3 emissions for 2022. This threshold is 154,000 metric tons of CO2e. Emissions related to downstream transportation and distribution using vehicles not owned or controlled by Air Products have been estimated in prior years (2018 and earlier) and did not meet the 2% materiality threshold. As a result, the emissions are considered not relevant.

## Processing of sold products

### Evaluation status

Not relevant, explanation provided

### Emissions in reporting year (metric tons CO2e)

<Not Applicable>

### Emissions calculation methodology

<Not Applicable>

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

<Not Applicable>

### Please explain

Air Products manufactures a variety of gases that are used in over 30 industries. Most company products are gases that are consumed in our customers' processes. Emissions from the processing of these products cannot be reliably estimated.

## Use of sold products

### Evaluation status

Relevant, calculated

### Emissions in reporting year (metric tons CO2e)

2900000

### Emissions calculation methodology

Other, please specify (Emissions are based on sales of certain gases into specific applications and global warming potentials of the gases.)

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

0

### Please explain

Most gaseous products are fully consumed or incorporated into other products. Exceptions include carbon dioxide used for food and beverages, nitrous oxide used for medical purposes, and refrigerants. Emissions related to these products and applications were estimated based on sales volumes, assuming the gases would ultimately be emitted to the atmosphere and applying the applicable global warming potential.

## End of life treatment of sold products

### Evaluation status

Not relevant, explanation provided

### Emissions in reporting year (metric tons CO2e)

<Not Applicable>

### Emissions calculation methodology

<Not Applicable>

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

<Not Applicable>

### Please explain

Most gaseous products are fully consumed or incorporated into other products and do not require end of life treatment.

## Downstream leased assets

### Evaluation status

Not relevant, explanation provided

### Emissions in reporting year (metric tons CO2e)

<Not Applicable>

### Emissions calculation methodology

<Not Applicable>

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

<Not Applicable>

### Please explain

Air Products does not have downstream leased assets.

## Franchises

### Evaluation status

Not relevant, explanation provided

### Emissions in reporting year (metric tons CO2e)

<Not Applicable>

### Emissions calculation methodology

<Not Applicable>

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

<Not Applicable>

### Please explain

Air Products does not have franchises.

## Investments

### Evaluation status

Relevant, calculated

### Emissions in reporting year (metric tons CO2e)

### Emissions calculation methodology

Hybrid method

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

100

### Please explain

Most of our investments are non-publicly traded ventures with other companies in the industrial gases business. Emissions related to joint ventures that are consolidated in our financial statements are included in our Scope 1 and 2 emissions reported herein.

Investment emissions are estimated for equity affiliates and investments not under Air Products' control. Emissions per unit revenue are calculated for Air Products' businesses as part of our annual GHG inventory process. These factors are applied to the incomes from the equity affiliates and investments by business type to estimate emissions based on revenue. These emissions are subsequently summed to estimate the total emissions for equity affiliates and investments. Emissions are estimated based on the incomes reported by our equity affiliates and investments, so 100 percent of the calculated emissions are based on data from value chain partners.

**Other (upstream)**

**Evaluation status**

Not relevant, explanation provided

**Emissions in reporting year (metric tons CO2e)**

<Not Applicable>

**Emissions calculation methodology**

<Not Applicable>

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

<Not Applicable>

**Please explain**

No additional upstream Scope 3 emissions.

**Other (downstream)**

**Evaluation status**

Not relevant, explanation provided

**Emissions in reporting year (metric tons CO2e)**

<Not Applicable>

**Emissions calculation methodology**

<Not Applicable>

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

<Not Applicable>

**Please explain**

No additional downstream Scope 3 emissions.

C6.7

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

No

C6.10

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

**Intensity figure**

0.00209

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

26500000

**Metric denominator**

unit total revenue

**Metric denominator: Unit total**

12700000000

**Scope 2 figure used**

Location-based

**% change from previous year**

18

**Direction of change**

Decreased

**Reason(s) for change**

Change in renewable energy consumption  
Acquisitions  
Change in output  
Change in revenue

**Please explain**

The emissions intensity per unit revenue is lower in part because of energy improvements in Air Products operations. Despite increased production, combined emissions were relatively flat year over year. Percent change is based on restated Scope 1 and 2 values and previous ratio of 0.00256 mt CO2e / \$ revenue.

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**Intensity figure**

1210

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

26500000

**Metric denominator**

full time equivalent (FTE) employee

**Metric denominator: Unit total**

21900

**Scope 2 figure used**

Location-based

**% change from previous year**

8

**Direction of change**

Decreased

**Reason(s) for change**

Change in renewable energy consumption  
Acquisitions  
Change in output

**Please explain**

The emissions intensity per full time employee is lower because Air Products operations have become more energy efficient since last year. Despite an increase in the number of employees, emissions were relatively flat year over year. Percent change is based on restated Scope 1 and 2 values and previous ratio of 1,311 mt CO2e / employee.

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## C7. Emissions breakdowns

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### C7.1

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

Yes

#### C7.1a

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**(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	16792200	IPCC Sixth Assessment Report (AR6 - 100 year)
CH4	3000	IPCC Sixth Assessment Report (AR6 - 100 year)
N2O	4800	IPCC Sixth Assessment Report (AR6 - 100 year)

**C7.2**

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

Country/area/region	Scope 1 emissions (metric tons CO2e)
Americas	15519000
Other, please specify (Asia)	232000
Europe, Middle East and Africa (EMEA)	1049000

**C7.3**

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

By activity

**C7.3c**

**(C7.3c) Break down your total gross global Scope 1 emissions by business activity.**

Activity	Scope 1 emissions (metric tons CO2e)
<p>Hydrogen and export steam production</p> <p>Air Products supplies vast quantities of hydrogen (H2) to petroleum refiners to lower sulfur content and help in the making of cleaner-burning gasoline and diesel fuels that significantly reduce vehicle emissions. Export steam is a co-product of H2 manufacturing and has a significant energy efficiency advantage.</p> <p>The majority of Air Products' Scope 1 emissions are related to hydrogen and steam production.</p>	16618000
<p>Product distribution</p> <p>We have trucking fleets around the world that are focused on safety and efficiently delivering our products to our customers. To improve our distribution efficiency and reduce our Scope 1 CO2 emissions, we have many initiatives underway, including investments in new trucks, trailers, technology, and facilities.</p>	182000

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	Net Scope 1 emissions, metric tons CO2e	Comment
Cement production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Chemicals production activities	16600000	<Not Applicable>	Hydrogen and export steam production Air Products supplies vast quantities of hydrogen (H2) to petroleum refiners to lower sulfur content and help in the making of cleaner-burning gasoline and diesel fuels that significantly reduce vehicle emissions. Export steam is a co-product of H2 manufacturing and has a significant energy efficiency advantage.  The majority of Air Products' Scope 1 emissions are related to hydrogen and steam production.  Product distribution We have trucking fleets around the world that are focused on safely and efficiently delivering our products to our customers. To improve our distribution efficiency and reduce our Scope 1 CO2 emissions, we have many initiatives underway, including investments in new trucks, trailers, technology, and facilities.
Coal production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Electric utility activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Metals and mining production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (upstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (midstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (downstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Steel production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport OEM activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport services activities	<Not Applicable>	<Not Applicable>	<Not Applicable>

**C7.5**

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

Country/area/region	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
Americas	2642000	
Other, please specify (Asia)	6228000	
Europe, the Middle East, Africa and Russia (EMEAR)	830000	

**C7.6**

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

By activity

**C7.6c**

**(C7.6c) Break down your total gross global Scope 2 emissions by business activity.**

Activity	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
Production of air gases (nitrogen, oxygen and argon) Emissions are associated with the electricity and steam used to compress air so it can be cryogenically distilled into oxygen, nitrogen and argon in air separation units.  The majority of Air Products' Scope 2 emissions are related to air gas production.  Air Products has operations where we are able to access some electricity supplier emission factors or residual emissions factors, but are unable to report a Scope 2, market-based figure.	8935000	
Other electricity consumption Air Products' facilities that make products other than air gases also consume electricity in their operations.  Air Products has operations where we are able to access some electricity supplier emission factors or residual emissions factors, but are unable to report a Scope 2, market-based figure.	765000	

C7.7

(C7.7) Is your organization able to break down your emissions data for any of the subsidiaries included in your CDP response?

No

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
Cement production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Chemicals production activities	9655000		Production of air gases (nitrogen, oxygen and argon) Emissions are associated with the electricity and steam used to compress air so it can be cryogenically distilled into oxygen, nitrogen and argon in air separation units.  The majority of Air Products' Scope 2 emissions are related to air gas production. As indicated in question 6.2, Air Products has operations where we are able to access some electricity supplier emission factors or residual emissions factors, but are unable to report a Scope 2, market-based figure.
Coal production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Metals and mining production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (upstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (midstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (downstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Steel production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport OEM activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport services activities	<Not Applicable>	<Not Applicable>	<Not Applicable>

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	90	Natural gas consumed as a feedstock on an annual basis was estimated based on Air Products' hydrogen capacity of 9,000 tons per day. Air Products does not disclose actual hydrogen volumes, or the amount of natural gas used as a feedstock for hydrogen production, because hydrogen volumes are company confidential.  Consumption of natural gas was estimated based on its conversion to hydrogen using steam methane reforming. In this process, high temperature steam (H2O) reacts with natural gas (as CH4) in a reaction that yields syngas, which is a combination of carbon monoxide (CO) and hydrogen (H2):  $CH_4 + H_2O \rightarrow CO + 3 H_2$  This is followed by a water shift reaction where the CO is reacted with water to form more hydrogen:  $CO + H_2O \rightarrow CO_2 + H_2$  Using these equations and assuming an annual onstream value, the amount of natural gas required to produce 9,000 tons of hydrogen per day was estimated at 170,000,000 thousand cubic feet per year. An average upstream emissions factor for natural gas was calculated from Air Products' Scope 3, category 3 analysis and multiplied by the natural gas volume to determine the feedstock emissions. These emissions were added to other emissions estimated for Scope 3, Category 1 to obtain the total emissions for this category. Emissions related to natural gas were divided by the total and represent 90% of the emissions.
Other (please specify) (Industrial Gases)	10	Air Products purchases various industrial gases that it sells directly, and/or purifies and sells, and/or repackages and sells. These gases represent the remaining Scope 3, Category 1 emissions. The emissions for these gases are estimated based on gas purchases and typical product footprints for the gases that have been taken from literature sources or other available data.

C-CH7.8a

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

	Sales, metric tons	Comment
Carbon dioxide (CO2)	0	Air Products provides CO2 to customers for a variety of applications including beverages, chemicals, food and horticulture. Sales volumes of CO2 are considered company confidential. Scope 3 emissions related to the use of CO2 are included in the response to question C6.5 under the Use of Sold Products category.
Methane (CH4)	0	Air Products sells small quantities of methane in cylinders and/or gas mixes. Sales volumes are considered company confidential.
Nitrous oxide (N2O)	0	Nitrous oxide is used as an inhalant anesthetic and analgesic drug with other anesthetic agents and oxygen. It is also used in liquid form to create a source of cold in cryotherapy, among other uses. Sales volumes of N2O are considered company confidential. Scope 3 emissions related to the use of N2O are included in the response to question C6.5 under Use of Sold Products category.
Hydrofluorocarbons (HFC)	0	Air Products sells small volumes of refrigerants. Sales volumes of refrigerants are considered company confidential. Scope 3 emissions related to the use of CO2 are included in the response to question C6.5 under the Use of Sold Products category.
Perfluorocarbons (PFC)	0	Air Products does not sell PFCs
Sulphur hexafluoride (SF6)	0	Air Products sells small quantities of sulfur hexafluoride in cylinders and/or gas mixes. Sales volumes are considered company confidential.
Nitrogen trifluoride (NF3)	0	Air Products sells small quantities of nitrogen trifluoride in cylinders and/or gas mixes. Sales volumes are considered company 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?**

Increased

**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 in emissions	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption	0	No change	0	Air Products does not report Scope 2 Market-Based emissions; therefore, reported emissions did not change due to increased use of renewable energy. Renewable electricity use did increase by 7% from 2021 to 2022.
Other emissions reduction activities	200000	Decreased	1	Each year, Air Products undertakes improvement projects to increase energy efficiency, improve process material efficiency, optimize distribution and reduce CO2 emissions. These projects are tracked in a database that includes active and completed projects by year. In 2021, 30 projects were implemented and saved an estimated 200,000 metric tons of CO2 (as reported in the response to questions 4.3a and 4.3b). Emissions were estimated by multiplying energy savings due to project improvements by relevant emissions factors.  The emissions value percentage was calculated as the emissions saved divided by Air Products' total emissions in 2022, or  $200,000 / 26,500,000 = 1\%$
Divestment	0	No change	0	Air Products did not make any divestitures in 2022.
Acquisitions	2000000	Increased	8	Air Products acquired 5 hydrogen facilities which came under operational control in 2022. The addition of these facilities increased total emissions by 2,000,000 metric tonnes CO2e. These additional emissions represent 8% of the total 2022 Scope 1 and 2 emissions. $(2,000,000 / 26,500,000 = 8\%)$
Mergers	0	No change	0	Air Products was not involved in any mergers in 2022.
Change in output	500000	Increased	2	Customer demand for certain products increased in 2022 as industry continued to recover from the impacts of the COVID-19 pandemic. To meet this increased demand, more energy was used in 2022 compared to 2021 and as a result, CO2 emissions increased. The amount of additional CO2 has been based on production volumes and emissions perproduction volume:  $CO_2 \text{ (MT CO}_2\text{e)} = \text{Production Volume Increase (MT)} * \text{Emissions per Production Volume (MT CO}_2\text{e/MT production)}$  Both the production volume increase and emissions per production volume were estimated based on 2022 operating data and are company confidential.  The emissions value percentage was calculated as the emissions divided by Air Products' total emissions in 2022, or:  $500,000 \text{ MT} / 25,600,000 \text{ MT} = 2\%$
Change in methodology	0	No change	0	Air Products did not change its methodologies for GHG emissions in 2022.
Change in boundary	0	No change	0	Air Products did not change its boundary for GHG emissions in 2022.
Change in physical operating conditions	0	No change	0	Air Products did not experience any changes in physical operating conditions in 2022.
Unidentified	0	No change	0	All changes in emissions have been accounted for in the above categories.
Other	0	No change	0	All changes in emissions have been accounted for in the above categories.

**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?**

Location-based

## C8. Energy

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### C8.1

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**(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	Yes

### 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	36357400	36357400
Consumption of purchased or acquired electricity	<Not Applicable>	5017000	12215000	17232000
Consumption of purchased or acquired heat	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of purchased or acquired steam	<Not Applicable>	0	5445000	5445000
Consumption of purchased or acquired cooling	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of self-generated non-fuel renewable energy	<Not Applicable>	4400	<Not Applicable>	4400
Total energy consumption	<Not Applicable>	5021400	53017400	58038800

### C-CH8.2a

---

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

**Consumption of fuel (excluding feedstocks)**

**Heating value**

LHV (lower heating value)

**MWh consumed from renewable sources inside chemical sector boundary**

0

**MWh consumed from non-renewable sources inside chemical sector boundary (excluding recovered waste heat/gases)**

35347000

**MWh consumed from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary**

0

**Total MWh (renewable + non-renewable + MWh from recovered waste heat/gases) consumed inside chemical sector boundary**

35347000

**Consumption of purchased or acquired electricity**

**Heating value**

<Not Applicable>

**MWh consumed from renewable sources inside chemical sector boundary**

5017000

**MWh consumed from non-renewable sources inside chemical sector boundary (excluding recovered waste heat/gases)**

12215000

**MWh consumed from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary**

0

**Total MWh (renewable + non-renewable + MWh from recovered waste heat/gases) consumed inside chemical sector boundary**

17232000

**Consumption of purchased or acquired steam**

**Heating value**

<Not Applicable>

**MWh consumed from renewable sources inside chemical sector boundary**

0

**MWh consumed from non-renewable sources inside chemical sector boundary (excluding recovered waste heat/gases)**

5445000

**MWh consumed from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary**

0

**Total MWh (renewable + non-renewable + MWh from recovered waste heat/gases) consumed inside chemical sector boundary**

5445000

**Consumption of self-generated non-fuel renewable energy**

**Heating value**

<Not Applicable>

**MWh consumed from renewable sources inside chemical sector boundary**

4400

**MWh consumed from non-renewable sources inside chemical sector boundary (excluding recovered waste heat/gases)**

0

**MWh consumed from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary**

0

**Total MWh (renewable + non-renewable + MWh from recovered waste heat/gases) consumed inside chemical sector boundary**

4400

**Total energy consumption**

**Heating value**

<Not Applicable>

**MWh consumed from renewable sources inside chemical sector boundary**

5021400

**MWh consumed from non-renewable sources inside chemical sector boundary (excluding recovered waste heat/gases)**

53017400

**MWh consumed from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary**

0

**Total MWh (renewable + non-renewable + MWh from recovered waste heat/gases) consumed inside chemical sector boundary**

58038800

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	Yes
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	No

**C8.2c**

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

**Sustainable biomass**

**Heating value**

Unable to confirm heating value

**Total fuel MWh consumed by the organization**

0

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

0

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

0

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

0

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

<Not Applicable>

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

<Not Applicable>

**Comment**

Air Products does not use biomass. The "unable to confirm heating value" option was selected for data completeness.

**Other biomass**

**Heating value**

Unable to confirm heating value

**Total fuel MWh consumed by the organization**

0

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

0

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

0

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

0

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

<Not Applicable>

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

<Not Applicable>

**Comment**

Air Products does not use biomass. The "unable to confirm heating value" option was selected for data completeness.



**Other renewable fuels (e.g. renewable hydrogen)**

**Heating value**

Unable to confirm heating value

**Total fuel MWh consumed by the organization**

0

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

0

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

0

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

0

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

<Not Applicable>

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

<Not Applicable>

**Comment**

Air Products does not use other renewable fuels. The "unable to confirm heating value" option was selected for data completeness.

**Coal**

**Heating value**

Unable to confirm heating value

**Total fuel MWh consumed by the organization**

0

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

0

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

0

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

0

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

<Not Applicable>

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

<Not Applicable>

**Comment**

Air Products does not use coal. The "unable to confirm heating value" option was selected for data completeness.

**Oil**

**Heating value**

Unable to confirm heating value

**Total fuel MWh consumed by the organization**

0

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

0

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

0

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

0

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

<Not Applicable>

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

<Not Applicable>

**Comment**

Air Products does not use oil. The "unable to confirm heating value" option was selected for data completeness.

**Gas**

**Heating value**

LHV

**Total fuel MWh consumed by the organization**

35617000

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

873000

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

290000

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

34454000

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

<Not Applicable>

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

<Not Applicable>

**Comment**

**Other non-renewable fuels (e.g. non-renewable hydrogen)**

**Heating value**

LHV

**Total fuel MWh consumed by the organization**

760000

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

0

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

0

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

0

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

<Not Applicable>

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

<Not Applicable>

**Comment**

Fuel used for transportation of products.

**Total fuel**

**Heating value**

LHV

**Total fuel MWh consumed by the organization**

36377000

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

893400

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

1010000

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

34454000

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

<Not Applicable>

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

<Not Applicable>

**Comment**

Per guidance, fuel used for transportation of products is accounted for under self-generation of heat.

**C8.2d**

**(C8.2d) Provide details on the electricity, heat, steam, and cooling your organization has generated and consumed in the reporting year.**

	Total Gross generation (MWh)	Generation that is consumed by the organization (MWh)	Gross generation from renewable sources (MWh)	Generation from renewable sources that is consumed by the organization (MWh)
Electricity	24800	24800	4400	4400
Heat	1010000	1010000	0	0
Steam	34454000	18118000	0	0
Cooling	0	0	0	0

C-CH8.2d

---

(C-CH8.2d) Provide details on electricity, heat, steam, and cooling your organization has generated and consumed for chemical production activities.

**Electricity**

**Total gross generation inside chemicals sector boundary (MWh)**  
4400

**Generation that is consumed inside chemicals sector boundary (MWh)**  
4400

**Generation from renewable sources inside chemical sector boundary (MWh)**  
4400

**Generation from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary (MWh)**  
0

**Heat**

**Total gross generation inside chemicals sector boundary (MWh)**  
1010000

**Generation that is consumed inside chemicals sector boundary (MWh)**  
1010000

**Generation from renewable sources inside chemical sector boundary (MWh)**  
0

**Generation from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary (MWh)**  
0

**Steam**

**Total gross generation inside chemicals sector boundary (MWh)**  
34454000

**Generation that is consumed inside chemicals sector boundary (MWh)**  
18118000

**Generation from renewable sources inside chemical sector boundary (MWh)**  
0

**Generation from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary (MWh)**  
0

**Cooling**

**Total gross generation inside chemicals sector boundary (MWh)**  
34454000

**Generation that is consumed inside chemicals sector boundary (MWh)**  
18118000

**Generation from renewable sources inside chemical sector boundary (MWh)**  
0

**Generation from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary (MWh)**  
0

C8.2g

---

**(C8.2g) Provide a breakdown by country/area of your non-fuel energy consumption in the reporting year.**

**Country/area**

Other, please specify (Americas)

**Consumption of purchased electricity (MWh)**

7204000

**Consumption of self-generated electricity (MWh)**

2800

**Is this electricity consumption excluded from your RE100 commitment?**

<Not Applicable>

**Consumption of purchased heat, steam, and cooling (MWh)**

305000

**Consumption of self-generated heat, steam, and cooling (MWh)**

0

**Total non-fuel energy consumption (MWh) [Auto-calculated]**

7511800

---

**Country/area**

Other, please specify (Asia)

**Consumption of purchased electricity (MWh)**

7023000

**Consumption of self-generated electricity (MWh)**

400

**Is this electricity consumption excluded from your RE100 commitment?**

<Not Applicable>

**Consumption of purchased heat, steam, and cooling (MWh)**

5140000

**Consumption of self-generated heat, steam, and cooling (MWh)**

0

**Total non-fuel energy consumption (MWh) [Auto-calculated]**

12163400

---

**Country/area**

Other, please specify (Europe, Middle East, Africa, and Russia (EMEAR))

**Consumption of purchased electricity (MWh)**

3005000

**Consumption of self-generated electricity (MWh)**

1200

**Is this electricity consumption excluded from your RE100 commitment?**

<Not Applicable>

**Consumption of purchased heat, steam, and cooling (MWh)**

0

**Consumption of self-generated heat, steam, and cooling (MWh)**

0

**Total non-fuel energy consumption (MWh) [Auto-calculated]**

3006200

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**C-CH8.3**

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

Yes

**C-CH8.3a**

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**(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**

170000000

**Total consumption unit**

thousand cubic feet

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

0.05

**Heating value of feedstock, MWh per consumption unit**

0.08

**Heating value**

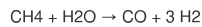
LHV

**Comment**

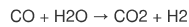
Natural gas consumption is on an annual basis and calculated from Air Products' hydrogen capacity of 9,000 tons per day. Air Products does not disclose actual hydrogen volumes, or the amount of natural gas used as a feedstock for hydrogen production, because hydrogen volumes are company confidential.

Consumption of natural gas was estimated based on its conversion to hydrogen using steam methane reforming.

In this process, high temperature steam (H2O) reacts with natural gas (as CH4) in a reaction that yields syngas, which is a combination of carbon monoxide (CO) and hydrogen (H2):



This is followed by a water shift reaction where the CO is reacted with water to form more hydrogen:



Using these equations and assuming an annual onstream value, the amount of natural gas required to produce 9,000 tons of hydrogen per day was estimated at 170,000,000 thousand cubic feet per year.

Air Products uses publicly available global warming potentials and emissions factors, primarily from the Intergovernmental Panel on Climate Change, International Energy Agency, and U.S. Energy Information Administration. The emissions factor used for natural gas is from the U.S. Energy Information Administration ([https://www.eia.gov/environment/emissions/co2\\_vol\\_mass.php](https://www.eia.gov/environment/emissions/co2_vol_mass.php)).

**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	0
Natural Gas	100
Coal	0
Biomass	0
Waste (non-biomass)	0
Fossil fuel (where coal, gas, oil cannot be distinguished)	0
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**

Energy usage

**Metric value**

0.93

**Metric numerator**

Energy usage in MWh

**Metric denominator (intensity metric only)**

Production in metric tonnes

**% change from previous year**

7

**Direction of change**

Decreased

**Please explain**

The production of industrial gases is energy intensive, which is why we Air Products has continuously increased the energy efficiency of our air separation units and hydrogen and carbon monoxide (HyCO) facilities through improved plant designs and efficient operations. These efforts also reduce CO2 emissions and water consumption. In fact, improving energy efficiency is one of the five mechanisms we are focused on to meet our "Third by '30" CO2 emissions intensity reduction goal.

The metric is calculated as the energy consumed in the current year per unit of production, divided by the energy consumed per unit production of the prior year:

$$\text{Energy use} = \left[ \frac{\text{MWh 2022} / \text{production 2022}}{\text{MWh 2021} / \text{production 2021}} \right]$$

This approach enables the improvement to be shown but does not disclose production, which is considered company confidential.

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**Description**

Other, please specify (Water use)

**Metric value**

0.96

**Metric numerator**

Water consumption in gallons

**Metric denominator (intensity metric only)**

Production in metric tonnes

**% change from previous year**

4

**Direction of change**

Decreased

**Please explain**

The production of industrial gases is energy intensive, which is why we Air Products has continuously increased the energy efficiency of our air separation units and hydrogen and carbon monoxide (HyCO) facilities through improved plant designs and efficient operations. These efforts also reduce water consumption.

The metric is calculated as the water consumed in the current year per unit of production, divided by the energy consumed per unit production of the prior year:

$$\text{Water use} = \left[ \frac{\text{gallons 2022} / \text{production 2022}}{\text{gallons 2021} / \text{production 2021}} \right]$$

This approach enables the improvement to be shown but does not disclose production, which is considered company confidential.

---

**C-CH9.3a**

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

**Output product**

Other, please specify (Hydrogen)

**Production (metric tons)**

3000000

**Capacity (metric tons)**

3000000

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

8.9

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

0.3

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

0

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

0.3

**Comment**

Production and capacity are based on Air Products' publicly stated capacity of 9,000 tons per day. Actual annual production is considered confidential. Direct emissions intensity, electricity intensity and steam/heat recovered are based on life cycle assessments published by third-parties. Air Products' values are considered confidential. Steam intensity is included as part of the direct emissions intensity and not separately reported.

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

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

	Investment in low-carbon R&D	Comment
Row 1	Yes	Low-carbon projects are a key aspect of Air Product's growth strategy.

**C-CH9.6a**

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**(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**

Other, please specify (R&D for technologies supporting the energy transition)

**Stage of development in the reporting year**

Full/commercial-scale demonstration

**Average % of total R&D investment over the last 3 years**

35

**R&D investment figure in the reporting year (unit currency as selected in C0.4) (optional)**

102900000

**Average % of total R&D investment planned over the next 5 years**

40

**Explain how your R&D investment in this technology area is aligned with your climate commitments and/or climate transition plan**

Our R&D strategy reflects our support of the global energy transition by emphasizing the optimization and integration of technologies needed for the success of our world-scale energy projects. Specifically, our R&D teams are focused on developing and enhancing technologies related to hydrogen, gasification, electrolysis, and ammonia as a hydrogen carrier, which are key to executing our business strategy. In addition to our significant R&D efforts, Air Products continues to innovate through new projects, particularly through the commercialization of cutting-edge green and blue hydrogen production technology and carbon capture technologies.

In 2022, nearly 70% of our R&D budget of \$102.9 million supported products and processes that are enabling zero- and low-carbon hydrogen energy, improving energy efficiency and/or benefitting the environment. Air Products estimates that nearly half of the R&D spend was related to technologies that support the energy transition.

**Technology area**

Other, please specify (Process improvements related to technologies and equipment)

**Stage of development in the reporting year**

Large scale commercial deployment

**Average % of total R&D investment over the last 3 years**

35

**R&D investment figure in the reporting year (unit currency as selected in C0.4) (optional)**

102900000

**Average % of total R&D investment planned over the next 5 years**

40

**Explain how your R&D investment in this technology area is aligned with your climate commitments and/or climate transition plan**

Our research groups are aligned with our businesses and focus on improving our processes and helping our customers. Research and Development (R&D) concentrates on new and improved processes and equipment for the production and delivery of industrial gases and new or improved applications for industrial gas products that help our customers improve sustainability.

In 2022, nearly 70% of our R&D budget of \$102.9 million supported products and processes that are enabling zero- and low-carbon hydrogen energy, improving energy efficiency and/or benefitting the environment.

**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**

2022-greenhouse-gas-verification-statement.pdf

**Page/ section reference**

Page 2, Section 5, Statement of Verification

Based on the procedures undertaken, it is our opinion that the Air Products 2022 Scope 1, and Scope 2, and Scope 3 Category 3 Emissions Inventory is supported by appropriate underlying evidence and is free of material misstatements.

**Relevant standard**

ISO14064-3

**Proportion of reported emissions verified (%)**

100

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**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 location-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**

2022-greenhouse-gas-verification-statement.pdf

**Page/ section reference**

Page 2, Section 5, Statement of Verification

Based on the procedures undertaken, it is our opinion that the Air Products 2022 Scope 1, and Scope 2, and Scope 3 Category 3 Emissions Inventory is supported by appropriate underlying evidence and is free of material misstatements.

**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: Fuel and energy-related activities (not included in Scopes 1 or 2)

**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**

2022-greenhouse-gas-verification-statement.pdf

**Page/section reference**

Page 2, Section 5, Statement of Verification

Based on the procedures undertaken, it is our opinion that the Air Products 2022 Scope 1, and Scope 2, and Scope 3 Category 3 Emissions Inventory is supported by appropriate underlying evidence and is free of material misstatements.

**Relevant standard**

ISO14064-3

**Proportion of reported emissions verified (%)**

100

---

**C10.2**

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**(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?**

No, but we are actively considering verifying within the next two years

**C11. Carbon pricing**

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**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**

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

Alberta TIER - ETS  
California CaT - ETS  
EU ETS  
Guangdong pilot ETS  
Korea ETS  
Ontario EPS - ETS  
Tianjin pilot ETS

**C11.1b**

---

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

**Alberta TIER - ETS****% of Scope 1 emissions covered by the ETS**

13

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

0

**Period start date**

January 1 2022

**Period end date**

December 31 2022

**Allowances allocated**

0

**Allowances purchased**

0

**Verified Scope 1 emissions in metric tons CO2e**

0

**Verified Scope 2 emissions in metric tons CO2e**

0

**Details of ownership**

Facilities we own and operate

**Comment**

Allowances allocated and purchased, as well as verified Scope 1 emissions for this program, are considered Company confidential.

**California CaT - ETS****% of Scope 1 emissions covered by the ETS**

24

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

0

**Period start date**

January 1 2022

**Period end date**

December 31 2022

**Allowances allocated**

0

**Allowances purchased**

0

**Verified Scope 1 emissions in metric tons CO2e**

0

**Verified Scope 2 emissions in metric tons CO2e**

0

**Details of ownership**

Facilities we own and operate

**Comment**Allowances allocated and purchased are considered Company confidential. Verified emissions are publicly reported by the California Air Resources Board (see <https://ww2.arb.ca.gov/mrr-data>)

## EU ETS

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

4

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

0

**Period start date**

January 1 2022

**Period end date**

December 31 2022

**Allowances allocated**

610542

**Allowances purchased**

0

**Verified Scope 1 emissions in metric tons CO2e**

610542

**Verified Scope 2 emissions in metric tons CO2e**

0

**Details of ownership**

Facilities we own and operate

**Comment**

Data for allowances and verified emissions has been provided because it is available in the public domain (see [https://ec.europa.eu/clima/policies/ets/registry\\_en](https://ec.europa.eu/clima/policies/ets/registry_en)). EU ETS is related to Scope 1 emissions, therefore values for Scope 2 emissions have been set to zero. No allowances were purchased, therefore the allowances purchased value has also been set to zero.

## Guangdong pilot ETS

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

0

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

1

**Period start date**

January 1 2022

**Period end date**

December 31 2022

**Allowances allocated**

0

**Allowances purchased**

0

**Verified Scope 1 emissions in metric tons CO2e**

0

**Verified Scope 2 emissions in metric tons CO2e**

0

**Details of ownership**

Facilities we own and operate

**Comment**

Allowances allocated and purchased, as well as verified Scope 2 emissions for this program, are considered Company confidential.

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

0

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

8

**Period start date**

January 1 2022

**Period end date**

December 31 2022

**Allowances allocated**

0

**Allowances purchased**

0

**Verified Scope 1 emissions in metric tons CO2e**

0

**Verified Scope 2 emissions in metric tons CO2e**

0

**Details of ownership**

Facilities we own and operate

**Comment**

Allowances allocated and purchased, as well as verified Scope 2 emissions for this program, are considered Company confidential.

**Ontario EPS - ETS****% of Scope 1 emissions covered by the ETS**

3

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

0

**Period start date**

January 1 2022

**Period end date**

December 31 2022

**Allowances allocated**

0

**Allowances purchased**

0

**Verified Scope 1 emissions in metric tons CO2e**

0

**Verified Scope 2 emissions in metric tons CO2e**

0

**Details of ownership**

Facilities we own and operate

**Comment**

Allowances allocated and purchased, as well as verified Scope 1 emissions for this program, are considered Company confidential.

## Tianjin pilot ETS

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

0

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

1

**Period start date**

January 1 2022

**Period end date**

December 31 2022

**Allowances allocated**

0

**Allowances purchased**

0

**Verified Scope 1 emissions in metric tons CO2e**

0

**Verified Scope 2 emissions in metric tons CO2e**

0

**Details of ownership**

Facilities we own and operate

**Comment**

Allowances allocated and purchased, as well as verified Scope 2 emissions for this program, are considered Company confidential.

## C11.1d

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

Our current strategy regarding allowance trading under the various emission trading schemes is to properly manage the compliance obligations of each of our facilities. Air Products pursues operating efficiency improvements wherever possible to minimize our compliance obligation. Where necessary, Air Products will purchase allowances/compliance instruments to satisfy its compliance obligations. For example, under the European Union's Emissions Trading Scheme (EU ETS) in 2022, Air Products was allocated credits equivalent to what was required and did not need to purchase allowances. If allowances allocated to the Company exceed the current compliance obligations, allowances will be retained for future compliance needs. Air Products is not trading allowances speculatively.

## C11.2

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**(C11.2) Has your organization canceled any project-based carbon credits within the reporting year?**

No

## C11.3

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

Yes

## C11.3a

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

**Type of internal carbon price**

Other, please specify (Air Products uses carbon intensity as a surrogate for carbon pricing when evaluating potential project opportunities that support the transition to the low-carbon economy.)

**How the price is determined**

Price with material impact on business decisions

**Objective(s) for implementing this internal carbon price**

Drive low-carbon investment

**Scope(s) covered**

Scope 1

Scope 2

Scope 3 (upstream)

Scope 3 (downstream)

**Pricing approach used – spatial variance**

Differentiated

**Pricing approach used – temporal variance**

Static

**Indicate how you expect the price to change over time**

<Not Applicable>

**Actual price(s) used – minimum (currency as specified in C0.4 per metric ton CO2e)**

0

**Actual price(s) used – maximum (currency as specified in C0.4 per metric ton CO2e)**

0

**Business decision-making processes this internal carbon price is applied to**

Capital expenditure

Opportunity management

**Mandatory enforcement of this internal carbon price within these business decision-making processes**

No

**Explain how this internal carbon price has contributed to the implementation of your organization’s climate commitments and/or climate transition plan**

Air Products uses carbon intensity as a surrogate for carbon pricing to support carbon risk and opportunity management and incentivize low-carbon activities. The carbon intensities of projects are estimated as the amount of CO2 emitted per unit of gas production. The carbon intensity can be converted to a cost basis using differentiated carbon pricing or pricing specific to the region where the project will be located. If a carbon price is not set for the region of interest, evolutionary pricing as considered in scenario analyses can be used. Because these prices can vary and a range cannot be used in the reporting form, a value of zero has been inserted above for the price used.

Air Products has announced an industry-leading capital commitment of \$15 billion to accelerate the energy transition. The company has committed \$11 billion to zero- and low-carbon hydrogen projects and expects to commit at least \$4 billion more to additional zero- and low-carbon hydrogen projects over the next five years.

Many factors are considered when evaluating these projects and their potential climate benefits. Carbon intensity, which is a surrogate for carbon pricing, is one such factor. Specifically, the use of carbon intensity enables Air Products to understand the impacts of projects, make changes to projects if necessary, and allocate capital resources to the most impactful projects. This approach also enables Air Products to evaluate other factors such as permitting and regulatory considerations, as well as long term liabilities and incentives.

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**C12. Engagement**

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**C12.1**

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

- Yes, our suppliers
- Yes, our customers/clients
- Yes, other partners in the value chain

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**C12.1a**

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

**Type of engagement**

Information collection (understanding supplier behavior)

**Details of engagement**

Collect climate-related risk and opportunity information at least annually from suppliers

**% of suppliers by number**

1

**% total procurement spend (direct and indirect)**

70

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

39

**Rationale for the coverage of your engagement**

Each year our Sustainability Team reviews the sustainability programs of suppliers that comprise a portion of our procurement spend to understand the suppliers' approach to sustainable supply and actions being taken to address climate change. Of these purchases, more than 80% on a cost basis were made from vendors with sustainability programs, including 95% of our largest energy suppliers. The Company has over 30,000 suppliers globally, which results in the low percentage of suppliers by number.

**Impact of engagement, including measures of success**

Measure of success

The measure of success for engaging with our suppliers is an increase in renewable energy procured and/or produced. The threshold for this measure is a year-over-year increase in the percentage of renewable electricity used by the Company including electricity procured or produced from renewable sources.

Impact of engagement

Understanding our suppliers' commitments to sustainability enables us to identify the companies we should engage on energy projects that can help reduce our GHG emissions. For example, we are working with several suppliers on procuring renewable energy. We purchase renewable electricity directly through our energy suppliers or by buying Renewable Energy Certificates (RECs) that link our power consumption to a specific asset that generates renewable electricity.

In 2022 Air Products increased its purchases of renewable electricity by 7%.

**Comment**

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**C12.1b**

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

**Type of engagement & Details of engagement**

Education/information sharing	Run an engagement campaign to educate customers about the climate change impacts of (using) your products, goods, and/or services
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**% of customers by number**

100

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

0

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

At Air Products, we help our customers improve their sustainability performance. Our products enable our customers to be more productive and efficient – to make more with less while reducing their impact on the environment. In 2022, our products enabled our customers and downstream users to avoid the equivalent of 86 million metric tons of carbon dioxide emissions. This figure is more than three times our own direct and indirect CO2e emissions.

Air Products is an important and significant supplier for many of our customers, often with on-site operations to produce hydrogen or other industrial gas products. Air Products routinely engages with the value chain partners to share information to help understand the highest impact strategies to decarbonize our customer's supply chains and operations. This may include sharing product carbon footprint data and helping customers optimize the supply mode of the products they receive.

We provide our customers with information about our products including our sustainable offerings, which are products that can help them improve energy efficiency, reduce environmental impact, and/or address a societal need. For example, hydrogen is a sustainable offering that is used to refine heavier, sour crudes, increase refinery yields and reduce emissions through cleaner transportation fuels including ultralow sulfur diesel fuel and hydrogen powered electric fuel cell vehicles. Air Products' oxy-fuel combustion technologies are also sustainable offerings and are used in energy intensive applications like cement, metals and glass manufacturing to increase production, lower fuel use and costs, reduce emissions and optimize efficiency.

Sales of sustainable offerings represented 56% of revenues in 2022.

**Impact of engagement, including measures of success**

**Measure of success**

The measure of success for engaging with our customers is their increasing level of interest in how we can help them achieve their sustainability goals and increasing the emissions we enable them to avoid each year. Specifically, the threshold for success is a year-over-year increase in the quantity of CO2 emissions avoided by our customers through the use of our products and applications.

**Impact of engagement**

Air Products has been building its business over time with the focus on helping our customers achieve their business outcomes in a more sustainable way – whether that is by increasing productivity, producing better quality products, reducing energy use or lowering emissions. We believe increased customer understanding of Air Products as a sustainable solutions provider has driven new business and created opportunities to innovate with customers as they realize their energy strategies alongside economic growth and social development. In 2022 we continued to see an increase in customer interest in decarbonization and improving energy efficiency and particularly how we could help them meet their sustainability goals, consistent with our measure of success.

Each year Air Products tracks emissions avoided by our customers, and in some cases, users further downstream in the supply chain. Emissions are estimated based on the emissions avoided per unit of gas and then multiplied by the amount of gas sold in a year. Included are the emissions avoided through integration of Air Products with its customers, including the use of customer waste gases as feeds to our processes and providing customers with efficiently produced by-product steam from our hydrogen plants. In 2022, we enabled 86 million metric tons of CO2e to be avoided by our customers and their customers, which is approximately equivalent to the emissions from almost 19 million cars and more than three times our own direct and indirect CO2e emissions.

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**C12.1d**

**(C12.1d) Give details of your climate-related engagement strategy with other partners in the value chain.**

Where appropriate, Air Products participates in government-mediated forums with major customers where these forums are part of broader consultation processes leading to new environmental policy, for example, in The Netherlands, on the development of the country's Klimaatakkoord (Climate Accord). Through the vehicle of industrial gases industry associations, Air Products also cooperates with representative associations on developing legislation. In these cases, we seek to ensure that new environmental legislation is constructed so as to respect the environmental value brought by our business model.

Air Products has also engaged directly with contract hauliers, encouraging them to increase the efficiency of their fleets and consider alternative transportation fuels. Similarly, we have worked with tanker manufacturers to design jumbo trailers for some of our products that can reduce the distance travelled per volume of gas delivered. The measures of success for these efforts are improved fuel efficiency and reduced distribution distances, both of which reduce greenhouse gas emissions.

In 2022, Air Products and Cummins Inc., a global power and hydrogen technologies leader, furthered their partnership with the delivery of the first hydrogen fuel cell truck, the first step in Air Products' transition to a zero-emissions vehicle fleet. Cummins will provide hydrogen fuel cell electric powertrains integrated into selected OEM partners' heavy-duty trucks for Air Products as we continue to convert our global fleet of distribution vehicles to hydrogen fuel cell vehicles.

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**C12.2**

**(C12.2) Do your suppliers have to meet climate-related requirements as part of your organization's purchasing process?**

No, but we plan to introduce climate-related requirements within the next two years

C12.3

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**(C12.3) Does your organization engage in activities that could either directly or indirectly influence policy, law, or regulation that may impact the climate?**

**Row 1**

**External engagement activities that could directly or indirectly influence policy, law, or regulation that may impact the climate**

Yes, we engage directly with policy makers

Yes, our membership of/engagement with trade associations could influence policy, law, or regulation that may impact the climate

**Does your organization have a public commitment or position statement to conduct your engagement activities in line with the goals of the Paris Agreement?**

No, but we plan to have one in the next two years

**Attach commitment or position statement(s)**

<Not Applicable>

**Describe the process(es) your organization has in place to ensure that your external engagement activities are consistent with your climate commitments and/or climate transition plan**

Air Products' regional environmental specialists and Government Relations Team members provide expertise for matters related to greenhouse gases and climate change including internal policy development, regulations, and legislation. These experts contribute to and are aware of Air Products' position and goals related to greenhouse gases and climate change, which are articulated on our website, in our annual Sustainability Report, and through employee electronic communications. The experts also share information and best practices across regions to promote consistent approaches to climate change developments. In addition, all employees must follow Air Products' Code of Conduct and Business Ethics, which notes that it is the responsibility of every employee to protect our Company by conducting ourselves in strict compliance with the letter and spirit of the Code, as well as with all applicable laws.

**Primary reason for not engaging in activities that could directly or indirectly influence policy, law, or regulation that may impact the climate**

<Not Applicable>

**Explain why your organization does not engage in activities that could directly or indirectly influence policy, law, or regulation that may impact the climate**

<Not Applicable>

C12.3a

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**(C12.3a) On what policy, law, or regulation that may impact the climate has your organization been engaging directly with policy makers in the reporting year?**

**Specify the policy, law, or regulation on which your organization is engaging with policy makers**

U.S. Inflation Reduction Act (IRA)

The U.S. Inflation Reduction Act provides significant incentives for the production of low-carbon hydrogen in the United States.

**Category of policy, law, or regulation that may impact the climate**

Low-carbon products and services

**Focus area of policy, law, or regulation that may impact the climate**

Alternative fuels

Low-carbon innovation and R&D

**Policy, law, or regulation geographic coverage**

National

**Country/area/region the policy, law, or regulation applies to**

United States of America

**Your organization's position on the policy, law, or regulation**

Support with no exceptions

**Description of engagement with policy makers**

Air Products has engaged with policy makers to more clearly codify the rules for calculating the carbon intensity of hydrogen within the IRA. Engagement has focused on areas such as application of renewable energy credits, credit for use of low carbon feedstocks, and system boundaries for carbon intensity calculations.

**Details of exceptions (if applicable) and your organization's proposed alternative approach to the policy, law or regulation**

<Not Applicable>

**Have you evaluated whether your organization's engagement on this policy, law, or regulation is aligned with the goals of the Paris Agreement?**

Yes, we have evaluated, and it is aligned

**Please explain whether this policy, law or regulation is central to the achievement of your climate transition plan and, if so, how?**

Producing lower carbon intensity hydrogen is a key aspect of the energy transition. The IRA contains two provisions related to clean hydrogen production. One is a section 45V tax credit for which the credit value is based on life cycle CO2 emissions. There is also a substantial increase in the value of the 45Q tax credit for carbon sequestration that supports the production of blue hydrogen. These credits can help reduce the price differential for blue and green hydrogen compared to more CO2-intensive hydrogen.

C12.3b

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**(C12.3b) Provide details of the trade associations your organization is a member of, or engages with, which are likely to take a position on any policy, law or regulation that may impact the climate.**

**Trade association**

Other, please specify (European Industrial Gases Association)

**Is your organization's position on climate change policy consistent with theirs?**

Consistent

**Has your organization attempted to influence their position in the reporting year?**

Yes, we publicly promoted their current position

**Describe how your organization's position is consistent with or differs from the trade association's position, and any actions taken to influence their position**

EIGA supports the aims of the European climate targets, including the need for affordable and reliable renewable energy. It also promotes the role of industrial gases in the transition to a low-carbon economy. Funding supports member company cooperation on technical and safety matters to achieve the highest level of safety and environmental care in the handling of gases, as well as the development of standards and regulations. Funding figures are considered confidential.

**Funding figure your organization provided to this trade association in the reporting year (currency as selected in C0.4)**

0

**Describe the aim of your organization's funding**

<Not Applicable>

**Have you evaluated whether your organization's engagement with this trade association is aligned with the goals of the Paris Agreement?**

Yes, we have evaluated, and it is aligned

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C12.4

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

**Publication**

In voluntary sustainability report

**Status**

Complete

**Attach the document**

2023-Sustainability-Report.pdf

**Page/Section reference**

Governance: pages 53-54

Strategy/Risks and Opportunities: pages 1-2

Emissions Figures and Targets: pages 15, 65-66

Other Metrics: see energy and water data on pages 63-64

**Content elements**

Governance

Strategy

Risks & opportunities

Emissions figures

Emission targets

Other metrics

**Comment**

Air Products publishes a sustainability report each year that covers matters of importance to the Company, including climate change. The Sustainability Report is online at <https://www.airproducts.com/company/sustainability/sustainability-report>.

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**Publication**

In voluntary communications

**Status**

Complete

**Attach the document**

air-products-and-tcf-2023.pdf

**Page/Section reference**

TCFD elements are covered across the full document.

**Content elements**

Governance

Strategy

Risks & opportunities

Emissions figures

Emission targets

Other metrics

**Comment**

Air Products shows the alignment of its climate change programs with the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) through a matrix published with its annual Sustainability Report.

The TCFD alignment matrix is available online at <https://www.airproducts.com/company/sustainability/sustainability-report>

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**Publication**

In mainstream reports

**Status**

Complete

**Attach the document**

Air Products Annual Report 2022.pdf

**Page/Section reference**

See item 10: Directors, Executive Officers, and Corporate Governance

See item 1: Business

Page 25 - Outlook

**Content elements**

Governance

Strategy

Risks & opportunities

**Comment**

The Annual Report (10-k) covers topics including strategy, governance, and risks & opportunities related climate change and emissions performance.

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C12.5

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**(C12.5) Indicate the collaborative frameworks, initiatives and/or commitments related to environmental issues for which you are a signatory/member.**

	Environmental collaborative framework, initiative and/or commitment	Describe your organization's role within each framework, initiative and/or commitment
Row 1	We are not a signatory/member of any collaborative framework, initiative and/or commitment related to environmental issues	<Not Applicable>

**C15. Biodiversity**

**C15.1**

**(C15.1) Is there board-level oversight and/or executive management-level responsibility for biodiversity-related issues within your organization?**

	Board-level oversight and/or executive management-level responsibility for biodiversity-related issues	Description of oversight and objectives relating to biodiversity	Scope of board-level oversight
Row 1	Yes, executive management-level responsibility	Air Products' commitment to biodiversity is embodied in our Environmental, Health and Safety (EHS) Policy through which we commit to designing and operating our facilities in a manner that protects the environment and continually reduce the environmental impacts of our operations. The EHS Policy has been signed by our President, Chairman and CEO and our Vice President of Environment, Health, Safety and Quality (EHS&Q). Our CEO is considered the chief EHS officer of the Company and provides visible leadership to ensure compliance with applicable regulations and internal policies and procedures, as well as requiring key levels of management to integrate EHS performance improvement objectives into their strategic plans and key business objectives, among other requirements. The VP EHS&Q is responsible for ensuring effective EHS expertise and resources, establishing EHS objectives to drive continuous improvement and monitoring EHS performance, also among other requirements.	<Not Applicable>

**C15.2**

**(C15.2) Has your organization made a public commitment and/or endorsed any initiatives related to biodiversity?**

	Indicate whether your organization made a public commitment or endorsed any initiatives related to biodiversity	Biodiversity-related public commitments	Initiatives endorsed
Row 1	Yes, we have made public commitments only	Adoption of the mitigation hierarchy approach	<Not Applicable>

**C15.3**

**(C15.3) Does your organization assess the impacts and dependencies of its value chain on biodiversity?**

**Impacts on biodiversity**

**Indicate whether your organization undertakes this type of assessment**

No, but we plan to within the next two years

**Value chain stage(s) covered**

<Not Applicable>

**Portfolio activity**

<Not Applicable>

**Tools and methods to assess impacts and/or dependencies on biodiversity**

<Not Applicable>

**Please explain how the tools and methods are implemented and provide an indication of the associated outcome(s)**

<Not Applicable>

**Dependencies on biodiversity**

**Indicate whether your organization undertakes this type of assessment**

No, but we plan to within the next two years

**Value chain stage(s) covered**

<Not Applicable>

**Portfolio activity**

<Not Applicable>

**Tools and methods to assess impacts and/or dependencies on biodiversity**

<Not Applicable>

**Please explain how the tools and methods are implemented and provide an indication of the associated outcome(s)**

<Not Applicable>

**C15.4**

**(C15.4) Does your organization have activities located in or near to biodiversity- sensitive areas in the reporting year?**

Not assessed

**C15.5**

**(C15.5) What actions has your organization taken in the reporting year to progress your biodiversity-related commitments?**

	Have you taken any actions in the reporting period to progress your biodiversity-related commitments?	Type of action taken to progress biodiversity- related commitments
Row 1	No, we are not taking any actions to progress our biodiversity-related commitments, but we plan to within the next two years	<Not Applicable>

**C15.6**

**(C15.6) Does your organization use biodiversity indicators to monitor performance across its activities?**

	Does your organization use indicators to monitor biodiversity performance?	Indicators used to monitor biodiversity performance
Row 1	Yes, we use indicators	Response indicators

**C15.7**

**(C15.7) Have you published information about your organization's response to biodiversity-related issues for this reporting year in places other than in your CDP response? If so, please attach the publication(s).**

Report type	Content elements	Attach the document and indicate where in the document the relevant biodiversity information is located
In voluntary sustainability report or other voluntary communications	Content of biodiversity-related policies or commitments Details on biodiversity indicators	Sustainability Report, page 69 2023-Sustainability-Report.pdf

**C16. 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.**

No additional context to provide.

**C16.1**

**(C16.1) Provide details for the person that has signed off (approved) your CDP climate change response.**

	Job title	Corresponding job category
Row 1	Vice President of Sustainability	Chief Sustainability Officer (CSO)

**SC. Supply chain module**

**SC0.0**

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

Please see the introduction in our 2022 Climate Change response.

**SC0.1**