

Welcome to your CDP Climate Change Questionnaire 2019

C0. Introduction

C0.1

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

Air Products (NYSE:APD) serves customers globally with a unique portfolio of products, services and solutions that include atmospheric gases (oxygen, nitrogen, argon and rare gases), process gases (hydrogen, helium, carbon dioxide, carbon monoxide, syngas) and specialty gases, and equipment and services relating to the production or processing of gases. The company serves customers in many industries, including refining, chemical, gasification, metals, electronics, manufacturing, and food and beverage. For over 75 years, the company has enabled its customers to become more productive, energy efficient and sustainable. With fiscal 2018 annual revenues of \$8.9 billion, operations in more than 50 countries*, and more than 16,000 employees, we strive to build lasting relationships with our customers and communities based on understanding, integrity and passion. Corporate headquarters are located in eastern Pennsylvania's Lehigh Valley, near Allentown; European headquarters are at Hersham, near London, England; South American headquarters are located in Santiago, Chile; and Asian headquarters are in Shanghai, China.

We are focused on delivering technologies and solutions that contribute to cleaner air, energy efficiency improvements, and safer products for our customers and the communities where we live and operate. In bringing these unique capabilities and real answers to market problems, our commitment to protect the environment has never wavered.

From our leading position supplying hydrogen to refineries to make low-sulfur, cleaner burning fuels; to large-scale oxygen systems for solid fuel combustion and gasification; to delivery systems that support the hydrogen economy, we continue to invest in R&D to develop products and processes that contribute to cleaner air and greenhouse gas mitigation. In 2018, we estimate that our products enabled customers and downstream users to avoid 55 million metric tonnes of carbon dioxide (CO₂) emissions—equivalent to the emissions from 12 million cars and almost double our own direct and indirect CO₂ emissions.

We are committed to improving our environmental performance by operating efficiently. Industrial gas manufacturing is energy intensive. Air separation units require electricity or steam to compress air so that it can be cryogenically distilled into oxygen, nitrogen and argon. Likewise, the production of hydrogen consumes natural gas, and in some cases, refinery off-gas as a feedstock and as a fuel in the production process. The vast majority of our Scope 1 emissions are related to hydrogen production, while our Scope 2 emissions are due in large part to the electricity and steam we consume for air separation. Our Scope 3 emissions are related primarily to the fuels we consume, business travel and our investments. We are

committed to improving our environmental performance by operating efficiently, incorporating environmental considerations into the design of our facilities and products, effectively managing environmental risks, and communicating our results.

This is Air Products' 17th consecutive response to the Carbon Disclosure Project information request. Our emissions reporting period is January 1, 2018 to December 31, 2018.

Air Products has not provided responses to the following questions because some or all of the information requested is considered company confidential: C-CH7.8, C-CH7.8a, C8.2e, C-CH8.2e, C-CH8.3, C-CH8.3a and C-CH9.3a.

*Through subsidiaries, affiliates, and less-than-controlling interests in joint ventures or equity affiliates, Air Products conducts business in 50 countries outside the United States.

C0.2

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

	Start date	End date	Indicate if you are providing emissions data for past reporting years	Select the number of past reporting years you will be providing emissions data for
Row 1	January 1, 2018	December 31, 2018	Yes	2 years

C0.3

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

Argentina
 Belgium
 Brazil
 Canada
 Chile
 China
 Colombia
 Ecuador
 Egypt
 France
 Germany
 India
 Indonesia
 Ireland
 Israel
 Italy
 Japan
 Malaysia
 Netherlands

Poland
Portugal
Republic of Korea
Russian Federation
Saudi Arabia
Singapore
Slovakia
Spain
Switzerland
Taiwan, Greater China
Thailand
United Arab Emirates
United Kingdom of Great Britain and Northern Ireland
United States of America

C0.4

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

USD

C0.5

(C0.5) Select the option that describes the reporting boundary for which climate-related impacts on your business are being reported. Note that this option should align with your consolidation approach to your Scope 1 and Scope 2 greenhouse gas inventory.

Financial control

C-CH0.7

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

Row 1

Bulk organic chemicals

Bulk inorganic chemicals

Hydrogen
Oxygen
Other industrial gasses

Other chemicals

C1. Governance

C1.1

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

Yes

C1.1a

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

Position of individual(s)	Please explain
Chief Executive Officer (CEO)	Air Products manages sustainability through an interdisciplinary approach. Led by the company's Chairman, President and CEO, Air Products' Board of Directors has accountability for oversight of the company's Environmental, Health and Safety performance, which it reviews at least quarterly. The Corporate Governance and Nominating Committee has responsibility for monitoring the company's response to important public policy issues, including social responsibility, corporate citizenship and sustainability, which are reviewed on a routine basis. Climate change was one of the key subjects discussed by the Board in 2018.

C1.1b

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

Frequency with which climate-related issues are a scheduled agenda item	Governance mechanisms into which climate-related issues are integrated	Please explain
Scheduled – some meetings	Monitoring implementation and performance of objectives Monitoring and overseeing progress against goals and targets for addressing climate-related issues	The Corporate Governance and Nominating Committee reviews progress against the company's 2020 Sustainability Goals on an annual basis. These goals include targets for energy efficiency improvements and greenhouse gas emissions reductions, among other goals. The Board is also engaged in discussions about company activities that could potentially impact sustainability.

C1.2

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

Name of the position(s) and/or committee(s)	Responsibility	Frequency of reporting to the board on climate-related issues
Other C-Suite Officer, please specify The Senior Vice President, Chief Information Officer and Special Advisor to the Chairman holds the highest position with responsibility for climate-related issues. He also chairs the Sustainability Leadership Council.	Both assessing and managing climate-related risks and opportunities	Annually

C1.2a

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

The Board has accountability for oversight of the company's Environmental, Health and Safety performance. The Corporate Governance and Nominating Committee has responsibility for monitoring the company's response to important public policy issues, including social responsibility, corporate citizenship and sustainability, which are reviewed at least annually.

Air Products' Sustainability Leadership Council sets the company's sustainability strategy, reviews programs and performance, and is engaged in addressing the risks and opportunities related to climate change. The Council is chaired by the Senior Vice President, Chief Information Officer and Special Advisor to the Chairman, who reports to the company's Chairman, President and CEO. He also reports on sustainability progress to the Corporate Governance and Nominating Committee at least annually. Additional members of the Council include the:

- Executive Vice President and CFO
- Executive Vice President, General Counsel and Secretary
- Executive Vice President leading the company's Technology, Engineering, Project Execution, Large HyCO and ASU projects, Procurement, Manufacturing, Construction and Start-up functions
- Senior Vice President and Chief Human Resources Officer
- Vice President, Investor Relations and Corporate Relations
- Vice President, Corporate Communications
- Sustainability Director
- External Communications Manager

Risks and opportunities related to climate change are routinely identified and reviewed by our Greenhouse Gases Center of Excellence (GHG COE). The GHG COE is comprised of regional

environmental experts that report through the regional businesses; Government Relations team members that report to the Vice President, Investor Relations and Corporate Relations; and the Sustainability Team. Comprised of the Sustainability Director and staff, the Sustainability Team supports all aspects of sustainability and reports to the Senior Vice President, Chief Information Officer and Special Advisor to the Chairman. The GHG COE covers all regions of the company, including the Americas, Asia, and Europe/Middle East/Africa (EMEA). In addition to risk assessment, the GHG COE considers the financial impacts of climate change, supports internal policy development, tracks regulations and legislation, and regularly updates management. GHG COE members communicate risks to potentially impacted businesses to develop strategies and execute plans to address the risks.

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

C1.3

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

Yes

C1.3a

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

Who is entitled to benefit from these incentives?

Chief Executive Officer (CEO)

Types of incentives

Monetary reward

Activity incentivized

Efficiency target

Comment

Air Products has goals to improve energy efficiency for ASUs (air separation units) and HyCO (hydrogen, carbon monoxide, and syngas) facilities by 2.5% and 1.5%, respectively, by 2020 from a 2015 baseline. The company also has goals to reduce greenhouse gas emissions intensity by 2% and improve distribution efficiency by 10% by 2020, both from a 2015 baseline year.

Air Products' Management Development and Compensation Committee of the Board has reserved the ability to adjust the Annual Incentive Plan pay-out within a range to reflect performance in areas such as safety, sustainability, diversity and productivity, progress on strategic objectives or individual performance factors. Accordingly, these factors are considered when determining whether to adjust annual incentive pay-outs

from the amount calculated based on achievement of financial targets.

"Efficiency target" was selected as the incentivized activity. These targets are also tied to our energy and emissions reduction targets.

Who is entitled to benefit from these incentives?

Corporate executive team

Types of incentives

Monetary reward

Activity incentivized

Efficiency target

Comment

Air Products has goals to improve energy efficiency for ASUs (air separation units) and HyCO (hydrogen, carbon monoxide, and syngas) facilities by 2.5% and 1.5%, respectively, by 2020 from a 2015 baseline. The company also has goals to reduce greenhouse gas emissions intensity by 2% and improve distribution efficiency by 10% by 2020, both from a 2015 baseline year.

Air Products' Management Development and Compensation Committee of the Board has reserved the ability to adjust the Annual Incentive Plan pay-out within a range to reflect performance in areas such as safety, sustainability, diversity and productivity, progress on strategic objectives or individual performance factors. Accordingly, these factors are considered when determining whether to adjust annual incentive pay-outs from the amount calculated based on achievement of financial targets.

"Efficiency target" was selected as the incentivized activity. These targets are also tied to our energy and emissions reduction targets.

Who is entitled to benefit from these incentives?

Management group

Types of incentives

Monetary reward

Activity incentivized

Efficiency target

Comment

Air Products has goals to improve energy efficiency for ASUs (air separation units) and HyCO (hydrogen, carbon monoxide, and syngas) facilities by 2.5% and 1.5%, respectively, by 2020 from a 2015 baseline. The company also has goals to reduce

greenhouse gas emissions intensity by 2% and improve distribution efficiency by 10% by 2020, both from a 2015 baseline year.

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.

"Efficiency target" was selected as the incentivized activity. These targets are also tied to our energy and emissions reduction targets.

Who is entitled to benefit from these incentives?

All employees

Types of incentives

Recognition (non-monetary)

Activity incentivized

Emissions reduction project

Comment

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

C2. Risks and opportunities

C2.1

(C2.1) Describe what your organization considers to be short-, medium- and long-term horizons.

	From (years)	To (years)	Comment
Short-term	0	1	
Medium-term	1	5	
Long-term	5	30	

C2.2

(C2.2) Select the option that best describes how your organization's processes for identifying, assessing, and managing climate-related issues are integrated into your overall risk management.

Integrated into multi-disciplinary company-wide risk identification, assessment, and management processes

C2.2a

(C2.2a) Select the options that best describe your organization's frequency and time horizon for identifying and assessing climate-related risks.

	Frequency of monitoring	How far into the future are risks considered?	Comment
Row 1	Six-monthly or more frequently	>6 years	Air Products uses a multi-disciplinary approach to assessing climate-related risks and opportunities that engages the company's Board of Directors, Sustainability Leadership Council, and Greenhouse Gases Center of Excellence (GHG COE). The GHG COE examines risks in the short and medium-term. The Sustainability Team has initiated climate scenarios to understand potential transition risks to 2030.

C2.2b

(C2.2b) Provide further details on your organization's process(es) for identifying and assessing climate-related risks.

Air Products serves customers globally with a portfolio of products, services, and solutions that include atmospheric gases, process and specialty gases, equipment, and services. The company's Industrial Gases business is organized and operated regionally. The regional Industrial Gases segments (Americas, Europe/Middle East/Africa (EMEA), and Asia) supply gases and related equipment in the relevant region to diversified customers in many industries. The company also designs and manufactures equipment for air separation, hydrocarbon recovery and purification, natural gas liquefaction (LNG), and liquid helium and liquid hydrogen transport and storage. Through subsidiaries, affiliates, and less-than-controlling interests in joint ventures or equity affiliates, Air Products conducts business in 50 countries outside the United States.

Climate-related risks can occur across the company's businesses, potentially impacting operations and products. For example, some of our operations are within jurisdictions that have or are developing regulatory regimes governing emissions of greenhouse gases (GHG) that can potentially increase operating costs and disadvantage our businesses. As a result, climate-related risks can be at many levels and across the company.

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

Our Greenhouse Gases Center of Excellence (GHG COE) identifies and reviews risks related to climate change at the regional level at least annually. The GHG COE is comprised of regional environmental experts and Government Relations team members representing the Americas, Asia, and EMEA, as well as our Sustainability Team. Comprised of the Sustainability Director and staff, the Sustainability Team supports all aspects of sustainability and reports to the Senior Vice President, Chief Information Officer and Special Advisor to the Chairman. GHG COE members communicate risks to potentially impacted businesses to develop strategies and execute plans to address the risks.

Air Products' Sustainability Leadership Council is also engaged in addressing risks related to climate change. The Council is focused on enhancing the visibility and understanding of the company's exposure to risks, overseeing the development and resourcing of related programs, and acting as a sounding board for management on these issues.

Ultimately the CEO and other members of senior management are responsible for assessing and managing the company's risk exposure, including the relative significance of risks and if the risks could have a material impact on the business. The Board and its committees provide oversight in connection with those efforts and consideration of risk is inherent in the Board's consideration of the company's long-term strategies. The Board and its committees also provide oversight in connection with transactions and other matters presented to the Board including, large capital expenditures, acquisitions and divestitures, cybersecurity and safety and environmental updates. Substantive risks that could have a material, adverse effect on the company's business, operating results or financial condition are reported each year in Air Products' Annual Financial Report. Key risk factors related to GHGs and climate change that were included in the 2018 Annual Report were: legislative, regulatory and societal responses to global climate change; potential interruptions in energy supply; costs and expenses resulting from compliance with environmental regulations; and catastrophic events that could disrupt operations, suppliers or customers.

C2.2c

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

	Relevance & inclusion	Please explain
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Current regulation	Relevant, always included	Some of our operations are within jurisdictions that have regulatory regimes governing emissions of greenhouse gases (GHGs), including carbon dioxide. These include existing coverage under the European Union Emission Trading system, the California Cap and Trade schemes, Alberta's Carbon Competitiveness Incentive Regulation, China's Emission Trading Scheme, South Korea's Emission Trading Scheme, nation-wide expansion of the China Emission Trading Scheme, revisions to the Alberta regulation, and Environment Canada's developing Output Based Pricing System. In addition, the U.S. Environmental Protection Agency 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.
Emerging regulation	Relevant, always included	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, 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.
Technology	Relevant, always included	Technology innovations could impact the use of some of the company's products. One example is hydrogen. As the world's largest 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 improve fuel efficiency, reduce the weight of vehicles, or enable driverless vehicles, will reduce consumption of transportation fuels that require hydrogen for processing.
Legal	Relevant, always included	Air Products is subject and adheres to various environmental laws and regulations of the countries in which we have operations. The company has not been subject to climate-related litigation claims.
Market	Relevant, always included	Air Products supplies industrial gases and related equipment that help its customers be more energy efficient and sustainable. Increased customer concerns about climate risks could potentially lead to reduced product demand for certain products due to the energy intensity of company products.
Reputation	Relevant, sometimes included	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 Air Products may change during the transition to a lower-carbon economy, potentially affecting the company's reputation.
Acute physical	Relevant, sometimes included	Our operations could be impacted by catastrophic events outside our control, including severe weather conditions such as hurricanes, floods, earthquakes, and 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.
Chronic physical	Not relevant, included	Several potential and chronic physical risks that Air Products is monitoring are 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 how they develop.
Upstream	Relevant, sometimes included	As described in Air Products' Supplier Sustainability Expectations (see http://www.airproducts.com/Company/supplier-information/Air-Products-Expectations-of-its-Suppliers.aspx), the company encourages suppliers to develop environmental sustainability programs for their operations and supply chains, including resource conservation and emissions reduction.
Downstream	Relevant, sometimes included	Air Products supplies industrial gases and related equipment that help its customers be more energy efficient and sustainable. Increased customer concerns about climate risks could potentially lead to reduced product demand due to the energy intensity of company products.

C2.2d

(C2.2d) Describe your process(es) for managing climate-related risks and opportunities.

Air Products' Greenhouse Gases Center of Excellence (GHG COE) supports the identification of risks (transitional and physical) and opportunities related to climate change. The risks and opportunities are shared with regional company businesses, and the Sustainability Leadership Council as needed, to develop strategies and execute plans. GHG COE members also engage with regulators on key concerns, for example, members have worked with governments in North America and Europe to ensure that our business model for producing on-site hydrogen is not disadvantaged from a carbon emissions perspective relative to a refinery customer making the hydrogen.

Transitional Risks – To understand the long-term risks of carbon emissions, we have initiated the analysis of climate scenarios. The scenarios are focused on the potential impacts of emerging carbon mitigation and renewable energy technologies; changing socio-economic

habits of society; and policy changes, including new and tighter regulations on carbon emissions that could impact our businesses directly or indirectly through energy pricing. Multiple scenarios have been considered to date, with the base scenario being consistent with limiting the global temperature increase to 2° Celsius. Additional scenarios, such as limiting the global temperature increase to 1.5° Celsius, have also been initiated to provide insight into how sensitive our businesses are to the different paths climate regulation and carbon mitigation could take.

Physical Risks - Project teams assess physical risks during project development using established procedures and criteria. Air Products also has a Business Continuity Planning process through which businesses can evaluate their operational assets and develop plans that can be implemented in the event of an impairment of the asset. The company 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. For these operations, the company and its insurers have concluded that weather-related events are not expected to have a material impact. This was validated after the hurricanes along the Gulf Coast in 2017.

Opportunities - Our businesses serve energy, environmental and emerging markets through opportunities related to climate change and/or emerging environmental regulations. The company is investing in the research and development of offerings that enable its customers to reduce their environmental footprint and energy consumption, as well as projects to improve our own processes. In 2018, half of our total R&D budget of \$65 million was spent on products and processes that reduce GHGs and address other sustainability issues.

The company is a leader in climate innovation, as exemplified by:

- Efficiency-optimized steam methane reforming technology for hydrogen production;
- Hydrogen fueling capabilities, including involvement in more than 250 fueling stations in over 20 countries for commercial and governmental use, as well as fuel cells for material handling such as forklifts;
- World-leading natural gas liquefaction equipment; and,
- Novel CO₂ capture technology, including the design, construction, start-up and operation of a state-of-the-art system to demonstrate the capture of CO₂ from Air Products' steam methane reformers (SMRs) in the Valero Port Arthur Texas refinery.

In 2018, Air Products executed several projects focused on clean energy and other technologies that demonstrate the company's innovative skills, including:

- Inaugurating a new world-scale industrial gas complex within the Integrated Refinery Expansion Project (IREP) of the Bharat Petroleum Corporation Limited (BPCL) Kochi Refinery located in Kochi, India. The complex generates hydrogen, nitrogen, oxygen, and steam, and is an invaluable constituent of BPCL's IREP to manufacture auto-fuels complying with Euro-IV/Euro-V specifications.
- Commissioning a world-scale steam methane reformer (SMR) in Baytown, Texas to supply hydrogen and carbon monoxide (CO) to Covestro and other customers linked to Air Products' Gulf Coast Hydrogen and CO pipeline networks. The plant features the latest technology to maximize energy efficiency and reduce emissions, and includes optimal heat integration, which in turn lowers feedstock consumption. The plant

configuration and deployed technologies support Air Products' overall sustainability goals of reducing energy consumption and emissions.

- Increasing the use of renewable energy in 2018 that reduces our energy costs and environmental footprint. Efforts include expanding the use of renewable energy from wind, solar and hydropower facilities around the world and applying blockchain technology to certify green electricity.

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

Transition risk

Primary climate-related risk driver

Policy and legal: Other

Type of financial impact

Increased operating costs (e.g., higher compliance costs, increased insurance premiums)

Company- specific description

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

Some of our operations are within jurisdictions that have or are developing regulatory regimes governing emissions of greenhouse gases (GHGs), including carbon dioxide. These include existing coverage under the European Union Emission Trading system, the California Cap and Trade schemes, Alberta's Carbon Competitiveness Incentive Regulation, China's Emission Trading Scheme, South Korea's Emission Trading Scheme, nation-wide expansion of the China Emission Trading Scheme, revisions to the Alberta regulation, and Environment Canada's developing Output Based Pricing System. 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.

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)

200,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

GHG regulations could impact the price of energy. As a large consumer of natural gas and electricity, we could be impacted by these price increases.

The lack of definitive legislation or regulatory requirements prevents an accurate estimate of the long-term impact these measures will have on our operations. 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 mitigate most of the potential costs through contractual terms.

Management method

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 all our plants, and in

particular, 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 for our plants in North America, have improved energy efficiency by almost 30% since 1980.

Air Products has goals to improve energy efficiency for ASUs (air separation units) and HyCO (hydrogen, carbon monoxide, and syngas) facilities by 2.5% and 1.5%, respectively, by 2020 from a 2015 baseline. We continue to develop technologies that enable our customers and our facilities to lower energy consumption, improve efficiency and reduce emissions. In 2018, half of our total R&D budget of \$65 million was spent on products and processes that reduce GHGs and address other sustainability issues.

Our business planning processes consider productivity and energy efficiency targets, and we have integrated GHG considerations into other business processes. The company believes it will be able to mitigate most of the potential cost increases through contractual terms.

Cost of management

1,000,000

Comment

The company has incurred modest additional costs to actively engage in and monitor climate change risks and opportunities. This includes the efforts of our GHG COE and Environmental Compliance 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.

Identifier

Risk 2

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Transition risk

Primary climate-related risk driver

Market: Increased cost of raw materials

Type of financial impact

Increased operating costs (e.g., higher compliance costs, increased insurance premiums)

Company- specific description

Interruption in ordinary sources of energy

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 electricity, 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.

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)

200,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

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 mitigate most of the potential costs through contractual terms.

Management method

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 all our plants, and in particular, 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 for our plants in North America, have improved energy efficiency by almost 30% since 1980.

Air Products has goals to improve energy efficiency for ASUs (air separation units) and

HyCO (hydrogen, carbon monoxide, and syngas) facilities by 2.5% and 1.5%, respectively, by 2020 from a 2015 baseline. We continue to develop technologies that enable our customers and our facilities to lower energy consumption, improve efficiency and reduce emissions. In 2018, half of our total R&D budget of \$65 million was spent on products and processes that reduce GHGs and address other sustainability issues.

Cost of management

1,000,000

Comment

The company has incurred modest additional costs to actively engage in and monitor climate change risks and opportunities. This includes the efforts of our GHG COE and Environmental Compliance 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.

Identifier

Risk 3

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Physical risk

Primary climate-related risk driver

Acute: Increased severity of extreme weather events such as cyclones and floods

Type of financial impact

Increased operating costs (e.g., higher compliance costs, increased insurance premiums)

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, earthquakes, storms, epidemics, or acts of war and terrorism. 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

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)

10,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

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. The company and its insurers have concluded that weather related events are not expected to have a material impact on the company as the impacts are estimated to be less than \$10 million and would likely be spread over multiple locations. This is due in large part to how the company designs its facilities, with environmental considerations such as wind, rainfall and flooding considered during plant siting and design.

Management method

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.

Cost of management

1,000,000

Comment

The company has incurred modest additional costs to actively engage in and monitor climate change risks and opportunities. This includes the efforts of our GHG COE and Environmental Compliance 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.

C2.4

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

Yes

C2.4a

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

Identifier

Opp1

Where in the value chain does the opportunity occur?

Customer

Opportunity type

Products and services

Primary climate-related opportunity driver

Development and/or expansion of low emission goods and services

Type of financial impact

Increased revenue through demand for lower emissions products and services

Company-specific description

Regulation of Greenhouse Gases (GHGs) may produce new opportunities for us. We continue to develop technologies to help our facilities and our customers reduce energy consumption, improve efficiency, and lower emissions. We also have developed a portfolio of technologies that capture carbon dioxide from steam methane reforming, enable cleaner transportation fuels, and facilitate alternate fuel source development. In addition, the potential demand for clean coal could increase demand for oxygen, one of our main products, and boost demand for our proprietary technology for delivering low-cost oxygen.

Time horizon

Medium-term

Likelihood

More likely than not

Magnitude of impact

Low

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

100,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

Assuming the industrial gases industry grows by 3% per year (based on third-party reports) while the sales of offerings with energy and environmental benefits increases by 4% (based on a third-party revenue growth study), sales could increase by approximately \$100 million USD per year over the next five years.

Strategy to realize opportunity

We supply industrial gases and related equipment that help our customers be more energy efficient and sustainable. We are committed to providing them with the right innovations and solutions to make their processes better. At the same time, we're focused on improving our own processes to increase efficiency and reduce environmental impact. In 2018, half of our total R&D budget of \$65 million was spent on products and processes that reduce GHGs and address other sustainability issues.

Our Application Technology Teams, located in the United States, Europe and Asia, focus on new value creation for our customers through technology, equipment, and process solutions. Our sustainable approach helps customers improve productivity, product quality or cost, while enabling them to reduce dependence on hazardous materials or meet stringent environmental regulations. The regional teams collaborate closely on new application development that allows technologies developed in one region to be implemented across other geographies.

Cost to realize opportunity

0

Comment

There are no additional costs to realize this opportunity as the costs are built into our normal business costs.

C2.5

(C2.5) Describe where and how the identified risks and opportunities have impacted your business.

Impact	Description
--------	-------------

Products and services	Impacted for some suppliers, facilities, or product lines	The company has significant assets in areas that are subject to weather events that may be exacerbated by climate change. The company and its insurers have concluded that weather related events are not expected to have a material impact on the company as the impacts are estimated to be less than \$10 million and are likely to be spread over multiple locations. This is due in large part to how the company designs its facilities, with environmental considerations such as wind and rainfall considered during plant siting and design.
Supply chain and/or value chain	Impacted for some suppliers, facilities, or product lines	The most significant impact of extreme weather is typically due to shutdowns at customer facilities that prevent customers from receiving our products. Thus far these impacts have been immaterial.
Adaptation and mitigation activities	Impacted for some suppliers, facilities, or product lines	There have been immaterial impacts realized throughout the organization such as redesigning part of the process at some of our facilities due to increasing CO2 levels in the atmosphere and elevating equipment in areas predisposed to flooding.
Investment in R&D	Impacted for some suppliers, facilities, or product lines	Air Products typically invests a large portion of our R&D budget in developing energy efficiency and environmental solutions to enable our customers and our own facilities to improve their sustainability performance. In 2018, over half of our total R&D budget of \$65 million was spent on products and processes that improve energy efficiency and/or benefit the environment.
Operations	Impacted	Energy prices have been affected by local carbon regulation in select geographies. Energy grid costs are increasing as the intermittency of renewables requires more flexible and backup capacity schemes. Air Products has also realized impacts from water security and pursues water reductions globally as well as using sources of gray water where available.
Other, please specify	We have not identified any risks or opportunities	

C2.6

(C2.6) Describe where and how the identified risks and opportunities have been factored into your financial planning process.

	Relevance	Description
Revenues	Impacted for some suppliers, facilities, or product lines	Our broad customer base includes refining and petrochemical, metals, manufacturing, and other markets. We do not have a homogeneous customer base or end market, and no single customer accounts for more than 10% of our consolidated revenues. We typically contract to pass through cost increases

		<p>in energy and raw materials to customers, but cost variability can still have a negative impact on our results.</p> <p>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 the company will be able to mitigate most 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.</p> <p>Regulation of greenhouse gases may produce new opportunities for us. We continue to develop technologies to help our facilities and our customers lower energy consumption, improve efficiency, and lower emissions. We also have developed a portfolio of technologies that capture carbon dioxide from steam methane reforming, enable cleaner transportation fuels, and facilitate alternate fuel source development. In addition, the potential demand for clean coal could increase demand for oxygen, one of our main products, and our proprietary technology for delivering low-cost oxygen.</p>
Operating costs	Impacted for some suppliers, facilities, or product lines	<p>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.</p> <p>Approximately \$210 million of our long-term unconditional purchase obligations relate to feedstock supply for numerous HyCO (hydrogen, carbon monoxide, and syngas) facilities. The price of feedstock supply is principally related to the price of natural gas. However, long-term take-or-pay sales contracts to HyCO customers are generally matched to the term of the feedstock supply obligations and provide recovery of price increases in the feedstock supply. Due to the matching of most long-term feedstock supply obligations to customer sales contracts, we do not believe these purchase obligations would have a material effect on our financial condition or results of operations.</p> <p>The unconditional purchase obligations also include other product supply and purchase commitments and electric power</p>

		and natural gas supply purchase obligations, which are primarily pass-through contracts with our customers.
Capital expenditures / capital allocation	Impacted for some suppliers, facilities, or product lines	<p>Compliance with changes in laws or regulations can require additional capital expenditures or increase operating costs.</p> <p>Although precise amounts are difficult to determine, we estimate that we spent \$3 million, \$7 million, and \$3 million in fiscal years 2018, 2017, and 2016, respectively, on capital projects to control pollution. Capital expenditures to control pollution are estimated to be approximately \$4 million in both fiscal years 2019 and 2020.</p>
Acquisitions and divestments	Not yet impacted	Climate-related risks and opportunities have not impacted our acquisitions and divestments and have not been factored into financial planning.
Access to capital	Not yet impacted	Climate-related risks and opportunities have not impacted our access to capital and have not been factored into financial planning.
Assets	Not yet impacted	The company 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. For these operations, the company and its insurers have concluded that weather-related events are not expected to have a material impact on the company.
Liabilities	Not yet impacted	Climate-related risks and opportunities have not impacted our liabilities and have not been factored into financial planning.
Other	Not impacted	Air Products has not identified any other climate-related risks or opportunities that should be factored into our financial planning.

C3. Business Strategy

C3.1

(C3.1) Are climate-related issues integrated into your business strategy?

Yes

C3.1a

(C3.1a) Does your organization use climate-related scenario analysis to inform your business strategy?

Yes, qualitative

C-AC3.1b/C-CE3.1b/C-CH3.1b/C-CO3.1b/C-EU3.1b/C-FB3.1b/C-MM3.1b/C-OG3.1b/C-PF3.1b/C-ST3.1b/C-TO3.1b/C-TS3.1b

(C-AC3.1b/C-CE3.1b/C-CH3.1b/C-CO3.1b/C-EU3.1b/C-FB3.1b/C-MM3.1b/C-OG3.1b/C-PF3.1b/C-ST3.1b/C-TO3.1b/C-TS3.1b) Indicate whether your organization has developed a low-carbon transition plan to support the long-term business strategy.

No, we do not have a low-carbon transition plan

C3.1c

(C3.1c) Explain how climate-related issues are integrated into your business objectives and strategy.

i. Explanation of how business objectives and strategy have been influenced by climate-related issues

Our strategy focuses on creating value in the markets we serve, particularly energy, environmental and emerging markets. Providing our customers with innovative products and excellent service underpins all of our efforts. In serving our customers and making their operations more efficient and productive, we serve our higher purpose, which includes producing products that improve the environment and our customers' sustainability.

We supply industrial gases and related equipment that help our customers be more energy efficient and sustainable. Our oxy-fuel burners improve productivity for glass and metal manufacturers while reducing energy consumption and emissions. As the world's largest supplier of hydrogen, we supply vast quantities of hydrogen to petroleum refiners to lower sulfur content and help in the making of cleaner-burning gasoline and diesel fuels, significantly reducing vehicle emissions. We are also a leader in hydrogen fueling infrastructure and are helping to build the hydrogen economy around the world. Furthermore, we remain a global leader in liquefied natural gas (LNG) equipment, air separation plants, and hydrocarbon recovery and purification equipment.

ii. Explanation of whether business strategy is linked to an emissions reductions target or energy reduction target

We are continually working to improve our own productivity and reduce our impact on the environment consistent with our 2020 Sustainability Goals. This includes four environmental goals, each of which uses operating performance from 2015 as a baseline year:

- Save energy by reducing use intensity by 2.5% for Air Separation Units (ASUs), and 1.5% for hydrogen and carbon monoxide plants (HyCOs);
- Reduce GHG emissions intensity by 2%;
- Conserve water and lower use intensity by 5%; and
- Improve efficiency and reduce CO2 emissions related to distribution by 10%.

These goals reflect the environmental parameters of greatest importance to Air Products. The target for each goal was developed through an iterative process involving experts across Distribution, EH&S, Engineering, Operations, and Sustainability and took into account past performance, plans for facility start-ups and shutdowns, and industry benchmarking. The Sustainability Leadership Council approved the goals, which were aligned with Air Products' Board of Directors.

For decades, we have continually improved energy efficiency, which is directly related to CO₂ emissions and water consumption, making these goals appropriate for Air Products. An example of this improvement is our fleet of ASUs in North America, where we have increased energy efficiency by almost 30% since 1980.

We also have goals to enable customers to avoid CO₂ emissions and to contribute more than 50% of our revenues from sustainable offerings, which are products and applications that improve energy efficiency, reduce environmental impact, and address societal needs. Air Products estimates that the potential emissions avoided by industrial gas customers for our products and applications totaled 55 million metric tonnes of CO₂ equivalents (CO₂e) in 2018. Also, in 2018, 54% of our revenue was related to our sustainable offerings.

iii. Most substantial business decisions made during the reporting year that have been influenced by the climate change

We are investing in innovations aimed at reducing emissions and environmental impacts. As a solutions provider, Air Products seeks to identify opportunities where our technology and product strengths bring cost-effective solutions that enable our customers to reduce their overall supply-chain environmental impact. Examples include:

- Oxygen for oxy-fuel combustion that reduces fuel consumption and GHG emissions; for de-bottlenecking catalytic cracking units and sulfur recovery units; for facilitating CO₂ capture and sequestration; and for use in biomass combustion/gasification for renewable power and biofuels.
- Hydrogen to enable refiners to meet fuels emissions standards while increasing the amount of fuel that can be produced from every barrel of oil; for use as an emission-free transportation fuel; and for use in the production of biodiesel from renewable feedstocks.
- Nitrogen for unconventional natural gas production.
- Energy-integrated LNG.
- Gases for high efficiency lighting and insulation of windows to reduce energy losses from buildings.

In 2018, half of our total R&D budget of \$65 million was spent on products and processes that reduce GHGs and address other sustainability issues.

One of the most substantial business decisions made in 2018 that was influenced by climate change was to significantly increase our use of renewable energy across several geographies, thereby reducing our environmental footprint and costs. These efforts included expanding the use of renewable energy from wind, solar and hydropower facilities and applying blockchain

technology to certify green electricity. Of our electricity purchases in 2018, 23% was from renewable sources. The company also:

- Acquired Shell's Coal Gasification technology and patents and formed a strategic alliance with Shell for liquids (residue) gasification for refineries. These moves extended Air Products' offerings in synthesis gas (syngas) to provide turn-key sale-of-gas gasification facilities for solids (coal and biomass) and liquids (refinery residues). Gasification technologies convert lower-value feedstocks into syngas that can be used make higher-value products such as substitute natural gas, power, steam, hydrogen, transportation fuels, fertilizers, chemicals, and more. Gasification of coal is the cleanest of all coal-based electric power technologies and produces significantly lower levels of air emissions and solid waste than traditional, combustion-based power generating processes.
- Announced a definitive agreement to purchase ACP Europe SA (ACP), the largest independent CO₂ business in Continental Europe. The acquisition included a liquid carbon dioxide production unit in the northeast of France that uses a renewable, bioethanol source.

C3.1d

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

Climate-related scenarios	Details
	<p>To understand the long-term risks of carbon emissions, we have initiated the analysis of various climate scenarios. The scenarios are focused on the potential impacts of emerging carbon mitigation and renewable energy technologies; changing socio-economic habits of society; and policy changes, including new and tighter regulations on carbon emissions that could impact our businesses directly or indirectly through energy pricing. Multiple scenarios have been considered to date, with the base scenario being consistent with limiting the global temperature increase to 2° Celsius. Additional scenarios, such as limiting the global temperature increase to 1.5° Celsius, have also been initiated to provide insight into how sensitive our businesses are to the different paths climate regulation and carbon mitigation could take.</p> <p>Due to the uptick in developments related to carbon in 2018, and the increasing availability of climate scenarios in the public domain, we continued to enhance our scenarios throughout the year and into 2019. The completed scenarios will be shared with business and senior management, including our Sustainability Leadership Council, for consideration and management.</p>

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

Scope

Scope 1+2 (location-based)

% emissions in Scope

100

Targeted % reduction from base year

2

Metric

Other, please specify
Normalized ratio of CO2 to production

Base year

2015

Start year

2015

Normalized base year emissions covered by target (metric tons CO2e)

1

Target year

2020

Is this a science-based target?

No, and we do not anticipate setting one in the next 2 years

% of target achieved

75

Target status

Underway

Please explain

Our intensity goal is configured as the ratio of reporting year (2018) emissions to reporting year production divided by the emission to production ratio in our Base Year (2015). Using a ratio allows the reported results to be dimensionless and protects confidential production data. For 2018, our GHG intensity was reduced by 1.5% from the baseline year. This was due to our improvement in energy efficiency. In 2018, our air

separation units realized a 2% improvement in energy intensity from a baseline year of 2015. Our hydrogen and carbon monoxide units improved energy efficiency by 0.9%. These successes were realized through the commissioning of new, larger and more efficient facilities, as well as hundreds of facility improvement projects involving changes to equipment and manufacturing processes.

% change anticipated in absolute Scope 1+2 emissions

5

% change anticipated in absolute Scope 3 emissions

4

Target reference number

Int 2

Scope

Scope 1

☞ This goal is only for Scope 1 emissions related to our Fleet operations (diesel consumed to deliver liquid product).

% emissions in Scope

100

Targeted % reduction from base year

10

Metric

Other, please specify

Normalized ratio of CO₂ / delivered product

Base year

2015

Start year

2015

Normalized base year emissions covered by target (metric tons CO₂e)

1

Target year

2020

Is this a science-based target?

No, and we do not anticipate setting one in the next 2 years

% of target achieved

100

Target status

Achieved

Please explain

Our fleet intensity goal is configured as the ratio of reporting year (2018) emissions to reporting year product delivered divided by the emission to delivery ratio in our Base Year (2015). Using a ratio allows the intensity value to be dimensionless and protects confidential production and distribution data. For 2018, our GHG intensity related to deliveries was reduced 16% from the baseline year, and we have exceeded our goal.

To improve our fleet efficiency in 2018 we replaced and upgraded 15% of our North American tractors as part of a six-year implementation plan. In the UK, we replaced and upgraded nearly 50% of our fleet with fuel efficient Euro 6 compliant tractors that also reduce NOx, CO and PM emissions by 10-15%. We are also replacing tractors in France, Belgium and The Netherlands while testing the impacts of aerodynamic kits. Additional fleet upgrades include raising payloads on some vehicles, increasing tons-per-distance-driven, and fuel efficiency. Improvements to our French fleet will help us meet our commitment to FRET 21, which we renewed and pledged an additional 7% reduction of CO2 emissions in our product transport within France. Alternative delivery methods, such as our Microbulk business that uses intermediate-sized vehicles, as well as our scheduling teams' efforts to reduce overall driving distances, contribute favorably to our distribution efficiency.

% change anticipated in absolute Scope 1+2 emissions

-6

% change anticipated in absolute Scope 3 emissions

0

C4.2

(C4.2) Provide details of other key climate-related targets not already reported in question C4.1/a/b.

Target

Other, please specify
Water intensity reduction

KPI – Metric numerator

Water intensity in current year

KPI – Metric denominator (intensity targets only)

Water intensity in baseline year

Base year

2015

Start year

2015

Target year

2020

KPI in baseline year

1

KPI in target year

0.95

% achieved in reporting year

100

Target Status

Achieved

Please explain

Air Products consumes water to produce its industrial gas products and has set a 2020 sustainability goal to reduce the water intensity of producing our products by 5%. Our intensity goal is configured as the ratio of reporting year (2018) water use to reporting year production divided by the water use to production ratio in our Base Year (2015). Using a ratio allows the intensity value to be dimensionless and protects confidential production data. In 2018 we exceeded this goal, achieving an 18% reduction in water intensity.

Part of emissions target

No

Is this target part of an overarching initiative?

No, it's not part of an overarching initiative

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 CO ₂ e savings in metric tonnes CO ₂ e (only for rows marked *)
Under investigation	0	0
To be implemented*	0	0

Implementation commenced*	460	86,000
Implemented*	342	72,000
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 type

Energy efficiency: Processes

Description of initiative

Process optimization

Estimated annual CO₂e savings (metric tonnes CO₂e)

72,000

Scope

Scope 2 (location-based)

Voluntary/Mandatory

Voluntary

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

14,000

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

28,000

Payback period

<1 year

Estimated lifetime of the initiative

Ongoing

Comment

C4.3c

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

Method	Comment
--------	---------

Compliance with regulatory requirements/standards	Members of our Greenhouse Gases Center of Excellence (GHG COE) track regulatory changes on a regional basis. The GHG COE is comprised of regional environmental experts and Government Relations team members representing the Americas, Asia, and Europe/Middle East/Africa (EMEA), as well as our Sustainability Team. In addition to tracking regulation and legislation, the GHG COE also supports risk assessment, understanding the financial impacts of climate change, supporting internal policy development, and regularly updating management.
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 (4.3a and 4.3b).
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, Safety and Sustainability 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 CO ₂ 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

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

Yes

C4.5a

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

Level of aggregation

Group of products

Description of product/Group of products

Air Products' gases and applications enable its customers and downstream users to reduce and/or avoid emissions of CO₂. These products include but are not limited to:

Oxy-fuel Technology - Air Products' oxy-fuel combustion technologies 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. We continue to help customers improve operations and efficiency through new burner designs and performance testing at our world-class combustion laboratory facilities.

Hydrogen - Hydrogen 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 is the world's largest provider of hydrogen, operating over 100 hydrogen plants and providing hydrogen from pipeline systems around the globe.

LNG Process Technology and Equipment - Air Products' liquefied natural gas (LNG) technology and equipment enable the efficient and economic production and transport of this critical energy resource, including from remote/stranded energy sources around the globe. More LNG is produced using Air Products' mixed component refrigerant and liquefaction processes than any other processes, with over 100 LNG trains currently in operation.

Gasification - Gasification technologies convert lower-value feedstocks into syngas that can be used make higher-value products such as substitute natural gas, power, steam, hydrogen transportation fuels, fertilizers, chemicals, and more. Gasification of coal is the cleanest of all coal-based electric power technologies and produces significantly lower levels of air emissions and solid waste than traditional, combustion-based power generating processes.

SmartFuel® Technology - Hydrogen can be used in many different types of transportation, either in a fuel cell or an internal combustion engine, to eliminate or significantly reduce emissions. Our SmartFuel® hydrogen fueling station technology provides complete fueling infrastructure from supply to dispensing for fuel cell vehicles and is used in 1.5 million hydrogen fills per year.

We estimate that our products and applications enabled the avoidance of 55 million MT CO₂e in 2018.

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

Avoided emissions

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

Addressing the Avoided Emissions Challenge- Chemicals sector

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

39

Comment

C5. Emissions methodology

C5.1

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

Scope 1

Base year start

January 1, 2015

Base year end

December 31, 2015

Base year emissions (metric tons CO₂e)

14,500,000

Comment

Air Products has restated greenhouse gas emissions to reflect acquisitions, divestitures and improved methodologies.

Scope 2 (location-based)

Base year start

January 1, 2015

Base year end

December 31, 2015

Base year emissions (metric tons CO₂e)

9,730,000

Comment

Air Products has restated greenhouse gas emissions to reflect acquisitions, divestitures and improved methodologies.

Scope 2 (market-based)

Base year start

Base year end

Base year emissions (metric tons CO₂e)

Comment

C5.2

(C5.2) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 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
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

C6. Emissions data

C6.1

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

Reporting year

Gross global Scope 1 emissions (metric tons CO₂e)

17,300,000

Start date

January 1, 2018

End date

December 31, 2018

Comment

Past year 1

Gross global Scope 1 emissions (metric tons CO₂e)

16,500,000

Start date

January 1, 2017

End date

December 31, 2017

Comment

Air Products has restated greenhouse gas emissions to reflect acquisitions, divestitures and improved methodologies.

Past year 2

Gross global Scope 1 emissions (metric tons CO₂e)

15,300,000

Start date

January 1, 2016

End date

December 31, 2016

Comment

Air Products has restated greenhouse gas emissions to reflect acquisitions, divestitures and improved methodologies.

C6.2

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

Row 1

Scope 2, location-based

We are reporting a Scope 2, location-based figure

Scope 2, market-based

We 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 has chosen not to report a market-based figure because it would disclose confidential business information. As reported in our 2019 Sustainability Report, the majority of the renewable electricity we purchase is used in France to make merchant industrial and medical gases. Reporting market-based Scope 2 emissions would provide insight into the energy consumed in France, which is considered confidential as it can be directly correlated to production.

C6.3

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

Reporting year

Scope 2, location-based

10,000,000

Start date

January 1, 2018

End date

December 31, 2018

Comment

Past year 1

Scope 2, location-based

9,500,000

Start date

January 1, 2017

End date

December 31, 2017

Comment

Air Products has restated greenhouse gas emissions to reflect acquisitions, divestitures and improved methodologies.

Past year 2

Scope 2, location-based

9,160,000

Start date

January 1, 2016

End date

December 31, 2016

Comment

Air Products has restated greenhouse gas emissions to reflect acquisitions, divestitures and improved methodologies.

C6.4

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

No

C6.5

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

Purchased goods and services

Evaluation status

Relevant, not yet calculated

Explanation

The principal raw materials for making atmospheric gases and hydrogen are air, energy as electricity or steam, and natural gas. The amount of natural gas consumed as a feedstock is considered company confidential, therefore Scope 3 emissions related to purchased goods and services are not disclosed.

Capital goods

Evaluation status

Relevant, not yet calculated

Explanation

Air Products' equipment is sold worldwide to customers in a variety of industries, including chemical and petrochemical manufacturing, oil and gas recovery and processing, and steel and primary metals processing. While we expect that Scope 3 emissions related to the materials used to make this equipment may be relevant, the emissions cannot be reliably estimated.

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

Evaluation status

Relevant, calculated

Metric tonnes CO₂e

4,000,000

Emissions calculation methodology

The amount of fuel was determined primarily from invoice-quality data. The consumption quantities were grouped based on the region of consumption. Cradle-to-gate emissions factors for the production of each fuel type were obtained from life-cycle assessment databases. For each fuel type, the amount consumed was multiplied by the fuel's cradle-to-gate emissions factor specific to the respective regions to calculate the individual emissions that were subsequently summed to the total emissions amount. For electricity consumption, the fuel types and the amount of each were determined based on regional grid mixes, heat rates for respective fuel-type power plants and heating value of fuel types. Fuel for electricity was adjusted to account for the transmission and distribution losses for the regions as per data from World Development Indicators.

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

100

Explanation

Industrial gas manufacturing is energy intensive. Specifically, Air Separation Units (ASUs) require significant amounts of energy in the form of electricity or steam to compress air so that it can be cryogenically distilled into oxygen, nitrogen and argon. Likewise, the production of hydrogen consumes a significant quantity of natural gas as a feedstock and as a fuel in the production process. As a result, the upstream emissions of purchased fuels and electricity, together with transmission and distribution losses, represent the most significant source of Scope 3 emissions for Air Products. These emissions were subject to limited assurance by WSP (see 2018 Greenhouse Gas Inventory Verification at <http://www.airproducts.com/~media/Files/PDF/company/2018-greenhouse-gas-inventory-verification.pdf>).

Upstream transportation and distribution

Evaluation status

Not relevant, explanation provided

Explanation

The Corporate Value Chain (Scope 3) Accounting and Reporting Standard is used to determine the relevancy of each Scope 3 emissions category. Relevant Scope 3 emissions categories include those for which emissions exceed 100,000 metric tonnes CO₂e, or 2% of our total Scope 3 emissions. Emissions for this Scope 3 category do not meet this threshold; therefore, the emissions are deemed not relevant.

Waste generated in operations

Evaluation status

Not relevant, explanation provided

Explanation

The Corporate Value Chain (Scope 3) Accounting and Reporting Standard is used to determine the relevancy of each Scope 3 emissions category. Relevant Scope 3 emissions categories include those for which emissions exceed 100,000 metric tonnes CO₂e, or 2% of our total Scope 3 emissions. Emissions for this Scope 3 category do not meet this threshold; therefore, the emissions are deemed not relevant.

Business travel

Evaluation status

Not relevant, calculated

Metric tonnes CO₂e

20,100

Emissions calculation methodology

Business travel emissions include miles associated with traveling by airline, light truck and automobile. Airline travel emissions were calculated by segregating the number of flights taken in 2018 into short haul (<300 miles), medium haul (≥ 300 and ≤ 2300 miles) and long haul (>2300 miles) flights and by flight class. Based on the lengths (above) and flight classes, emissions factors were applied to estimate equivalent CO₂ emissions. Emissions from travel by rental car were calculated by applying US EPA emission factors for Business Travel from EPA to the mileage travelled based on the vehicle type. Travel in personal vehicles, including automobiles and light trucks, was captured by taking the number of miles travelled and multiplying by an emission factor based on vehicle type percentages from US Census data.

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

100

Explanation

Emissions from business travel are among the most reliable types of Scope 3 emissions that Air Products can estimate. This is due to the availability of usage data from our business travel providers, specifically business miles travelled by air and automobile.

Employee commuting

Evaluation status

Not relevant, explanation provided

Explanation

The Corporate Value Chain (Scope 3) Accounting and Reporting Standard is used to determine the relevancy of each Scope 3 emissions category. Relevant Scope 3 emissions categories include those for which emissions exceed 100,000 metric tonnes CO₂e, or 2% of our total Scope 3 emissions. Emissions for this Scope 3 category do not meet this threshold; therefore, the emissions are deemed not relevant.

Upstream leased assets

Evaluation status

Not relevant, explanation provided

Explanation

The Corporate Value Chain (Scope 3) Accounting and Reporting Standard is used to determine the relevancy of each Scope 3 emissions category. Relevant Scope 3 emissions categories include those for which emissions exceed 100,000 metric tonnes CO₂e, or 2% of our total Scope 3 emissions. Emissions for this Scope 3 category do not meet this threshold; therefore, the emissions are deemed not relevant.

Downstream transportation and distribution

Evaluation status

Not relevant, explanation provided

Explanation

The Corporate Value Chain (Scope 3) Accounting and Reporting Standard is used to determine the relevancy of each Scope 3 emissions category. Relevant Scope 3 emissions categories include those for which emissions exceed 100,000 metric tonnes CO₂e, or 2% of our total Scope 3 emissions. Emissions for this Scope 3 category do not meet this threshold; therefore, the emissions are deemed not relevant.

Processing of sold products

Evaluation status

Relevant, not yet calculated

Explanation

Air Products manufactures a variety of gases that are used in 30 industries. While we expect that emissions from the processing of these product may be relevant due to the volume of products manufactured and sold, emissions from the processing of these products cannot be reliably estimated.

Use of sold products

Evaluation status

Relevant, not yet calculated

Explanation

Air Products manufactures a variety of gases that are used in 30 industries. While we expect that emissions from these product uses may be relevant due to the volume of products manufactured and sold, emissions from the processing of these products cannot be reliably estimated.

End of life treatment of sold products

Evaluation status

Not relevant, explanation provided

Explanation

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

Explanation

Air Products does not have downstream leased assets.

Franchises

Evaluation status

Not relevant, explanation provided

Explanation

Air Products does not have franchises.

Investments

Evaluation status

Relevant, calculated

Metric tonnes CO₂e

1,200,000

Emissions calculation methodology

Emissions were estimated for equity affiliates that are not under Air Products control. The majority of our investments are non-publicly traded ventures with other companies in the industrial gases business. Emissions per revenue were calculated for Air Products facilities and these factors were applied to the incomes from the equity affiliates by business type. These emissions were subsequently summed to estimate the total emissions for equity affiliates.

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

0

Explanation

Emissions from equity affiliates represent the second largest source of Scope 3 emissions that can be reliably estimated year-over-year.

Other (upstream)

Evaluation status

Not relevant, explanation provided

Explanation

No additional upstream Scope 3 emissions.

Other (downstream)

Evaluation status

Not relevant, explanation provided

Explanation

No additional downstream Scope 3 emissions.

C6.7

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

No

C6.10

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

Intensity figure

0.003

Metric numerator (Gross global combined Scope 1 and 2 emissions)

27,300,000

Metric denominator

unit total revenue

Metric denominator: Unit total

8,900,000,000

Scope 2 figure used

Location-based

% change from previous year

4

Direction of change

Decreased

Reason for change

In 2018, our GHG emissions intensity declined by 1.5% compared to 2015 and we are on track to meet our 2020 goal of a 2% reduction in GHG emissions intensity.

C7. Emissions breakdowns

C7.1

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

Yes

C7.1a

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

Greenhouse gas	Scope 1 emissions (metric tons of CO ₂ e)	GWP Reference
----------------	--	---------------

CO ₂	17,267,000	IPCC Fourth Assessment Report (AR4 - 100 year)
CH ₄	3,000	IPCC Fourth Assessment Report (AR4 - 100 year)
N ₂ O	30,000	IPCC Fourth Assessment Report (AR4 - 100 year)

C7.2

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

Country/Region	Scope 1 emissions (metric tons CO ₂ e)
Americas	14,900,000
Other, please specify Asia	200,000
Europe, Middle East and Africa (EMEA)	2,200,000

C7.3

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

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 CO ₂ e	Comment
Chemicals production activities	17,300,000	The vast majority of our Scope 1 emissions are related to hydrogen production. 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 carbon dioxide.

C7.5

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

Country/Region	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)	Purchased and consumed electricity, heat, steam or cooling (MWh)	Purchased and consumed low-carbon electricity, heat, steam or cooling accounted in market-based approach (MWh)
Americas	3,100,000		7,130,000	
Other, please specify Asia	5,900,000		11,350,000	
Europe, Middle East and Africa (EMEA)	1,000,000		2,615,000	

C7.6

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

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

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

	Scope 2, location-based, metric tons CO2e	Scope 2, market-based (if applicable), metric tons CO2e	Comment
Chemicals production activities	10,000,000		The majority of our Scope 2 emissions are due to the electricity and steam we consume for air separation.

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
		Air Products considers this information to be confidential

C-CH7.8a

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

	Sales, metric tons	Comment
Carbon dioxide (CO ₂)		Air Products considers this information to be confidential.
Methane (CH ₄)		Air Products considers this information to be confidential.
Nitrous oxide (N ₂ O)		Air Products considers this information to be confidential.
Hydrofluorocarbons (HFC)		Air Products considers this information to be confidential.
Perfluorocarbons (PFC)		Air Products considers this information to be confidential.
Sulphur hexafluoride (SF ₆)		Air Products considers this information to be confidential.
Nitrogen trifluoride (NF ₃)		Air Products considers this information to be 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 CO ₂ e)	Direction of change	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption	28,000	Decreased	0.1	Air Products increased its use of renewable energy in 2018, continuing our journey to identify green energy sources that can reduce our energy costs and environmental footprint. The increase in renewable energy use decreased our Scope 2 emissions. The

				emissions reduction percentage has been calculated based on CDP guidance. Specifically, the percentage was calculated as [(Change in Scope 1+2 emissions attributed to the reason described in column 1) / (Previous year restated Scope 1+2 emissions)] x 100.
Other emissions reduction activities	72,000	Decreased	0.3	Air Products implemented 342 initiatives in 2018 that reduced CO2 emissions by 72,000 tons (as described in questions 4.3a and 4.3b). The emissions reduction percentage has been calculated based on CDP guidance. Specifically, the percentage was calculated as [(Change in Scope 1+2 emissions attributed to the reason described in column 1) / (Previous year restated Scope 1+2 emissions)] x 100.
Divestment	0	No change	0	There were no divestments in 2018.
Acquisitions	300,000	Increased	1.2	Air Products made several acquisitions in 2018. The acquisitions were included in our GHG inventory for 2018 and emissions for the acquisitions were estimated in the same manner as those for our existing facilities. The emissions increase has been calculated based on CDP guidance. Specifically, the percentage was calculated as [(Change in Scope 1+2 emissions attributed to the reason described in column 1) / (Previous year restated Scope 1+2 emissions)] x 100.
Mergers	0	No change	0	There were no mergers in 2018.
Change in output	1,100,000	Increased	4.2	The increased emissions were due to a significant increase in industrial gas production, particularly in Asia where our ASUs are often driven by steam produced from coal because electricity is not available. In 2018, our GHG emissions intensity declined by 1.5% compared to 2015 and we are on track to meet our 2020 goal. The emissions increase has been calculated based on CDP guidance. Specifically, the

				percentage was calculated as [(Change in Scope 1+2 emissions attributed to the reason described in column 1) / (Previous year restated Scope 1+2 emissions)] x 100.
Change in methodology	0	No change	0	There were no changes in methodology in 2018.
Change in boundary	0	No change	0	There were no changes in boundary in 2018.
Change in physical operating conditions	0	No change	0	There were no changes in physical operating conditions in 2018.
Unidentified	0	No change	0	There were no unidentified reasons for emissions changes in 2018.
Other	0	No change	0	There were no other reasons for emissions changes in 2018.

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

C8.1

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

More than 30% but less than or equal to 35%

C8.2

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

	Indicate whether your organization undertakes this energy-related activity
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 MWh
Consumption of fuel (excluding feedstock)	LHV (lower heating value)	0	29,700,000	29,700,000
Consumption of purchased or acquired electricity		535,000	15,060,000	15,595,000
Consumption of purchased or acquired steam		0	5,500,000	5,500,000
Consumption of self-generated non-fuel renewable energy		5,000		5,000
Total energy consumption		540,000		50,800,000

C-CH8.2a

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

	Heating value	Total MWh
Consumption of fuel (excluding feedstock)	LHV (lower heating value)	29,700,000
Consumption of purchased or acquired electricity		15,595,000
Consumption of purchased or acquired steam		5,500,000
Consumption of self-generated non-fuel renewable energy		5,000
Total energy consumption		50,800,000

C8.2b

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

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

Fuels (excluding feedstocks)

Natural Gas

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

29,276,000

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

5,500,000

Comment

Steam is generated primarily using natural gas.

Fuels (excluding feedstocks)

Diesel

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

400,000

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

0

Comment

Most diesel consumed is related to product transportation.

Fuels (excluding feedstocks)

Jet Kerosene

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

16,000

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

0

Comment

Fuels (excluding feedstocks)

Motor Gasoline

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

8,000

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

0

Comment

C8.2d

(C8.2d) List the average emission factors of the fuels reported in C8.2c.

Diesel

Emission factor

73.96

Unit

kg CO₂e per million Btu

Emission factor source

U.S. EPA Emission Factors for GHG Inventories Document

Comment

Jet Kerosene

Emission factor

72.22

Unit

kg CO₂e per million Btu

Emission factor source

U.S. EPA Emission Factors for GHG Inventories Document

Comment

Motor Gasoline

Emission factor

70.22

Unit

kg CO₂e per million Btu

Emission factor source

U.S. EPA Emission Factors for GHG Inventories Document

Comment

Natural Gas

Emission factor

53.06

Unit

kg CO2e per million Btu

Emission factor source

U.S. EPA Emission Factors for GHG Inventories Document

Comment

C8.2e

(C8.2e) 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				
Heat				
Steam				
Cooling				

C-CH8.2e

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

	Total gross generation (MWh) inside chemicals sector boundary	Generation that is consumed (MWh) inside chemicals sector boundary
Electricity		
Heat		
Steam		
Cooling		

C8.2f

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

Basis for applying a low-carbon emission factor

Low-carbon technology type

Region of consumption of low-carbon electricity, heat, steam or cooling

MWh consumed associated with low-carbon electricity, heat, steam or cooling

Emission factor (in units of metric tons CO₂e per MWh)

Comment

C-CH8.3

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

Feedstocks

Total consumption

Total consumption unit

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

Heating value of feedstock, MWh per consumption unit

Heating value

Comment

Air Products considers this information to be confidential. The company also considers the information in the following questions to be confidential: C8.2e, C-CH8.2e, C-CH8.3a.

C-CH8.3a

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

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

C9. Additional metrics

C9.1

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

Description

Other, please specify
Water Intensity

Metric value

0.82

Metric numerator

Water Intensity in current year

Metric denominator (intensity metric only)

Water Intensity in baseline year

% change from previous year

8

Direction of change

Decreased

Please explain

Air Products has established a goal to reduce water consumption by 5% on an indexed basis by 2020 from a 2015 baseline. We achieved this goal in 2017 and continued to improve water efficiency during 2018, reducing our water intensity by 8% in 2018 for a total reduction of 18% since the baseline year.

C-CH9.3a

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

Output product

Production (metric tons)

Capacity (metric tons)

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

Electricity intensity (MWh per metric ton of product)

Steam intensity (MWh per metric ton of product)

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

Comment

Air Products considers this information to be company confidential.

C-CH9.6

(C-CH9.6) Disclose your organization's low-carbon investments for chemical production activities.

Investment start date

June 1, 2017

Investment end date

December 31, 2018

Investment area

Services

Technology area

Other, please specify

Renewable Electricity

Investment maturity

Large scale commercial deployment

Investment figure

0

Low-carbon investment percentage

81 - 100%

Please explain

For our facilities in France, Air Products switched to renewable energy for producing merchant industrial and medical gases and to power our sales and administrative offices. The investment figure is considered company confidential because it relates to electricity use and production volume, which is considered confidential.

Investment start date

July 12, 2009

Investment end date

May 1, 2013

Investment area

Property, plant and equipment

Technology area

Carbon capture and storage (CCS)

Investment maturity

Full/commercial-scale demonstration

Investment figure

400,000,000

Low-carbon investment percentage

81 - 100%

Please explain

In 2013, Air Products brought onstream a state-of-the-art system to capture CO₂ from one of its steam methane reformers (SMR) located within a refinery in Port Arthur, Texas. The process captures approximately one million tons of CO₂ per year that is used in enhanced oil recovery project. (See: <http://www.airproducts.com/Company/news-center/2013/05/0510-air-products-celebrates-texas-carbon-capture-demonstration-project-achievement.aspx>)

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 and/or Scope 2 emissions and attach the relevant statements.

Scope

Scope 1

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

 2018-greenhouse-gas-inventory-verification.pdf

Page/ section reference

All

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

Scope

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

 2018-greenhouse-gas-inventory-verification.pdf

Page/ section reference

All

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

C10.1b

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

Scope

Scope 3- at least one applicable category


Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Attach the statement

 2018-greenhouse-gas-inventory-verification.pdf

Page/section reference

All

Relevant standard

ISO14064-3

C10.2

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

No, we do not verify any other climate-related information reported in our CDP disclosure

C11. Carbon pricing

C11.1

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

Yes

C11.1a

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

Alberta SGER
California CaT
EU ETS
Korea ETS

C11.1b

(C11.1b) Complete the following table for each of the emissions trading systems in which you participate.

Alberta SGER

% of Scope 1 emissions covered by the ETS

13

Period start date

January 1, 2018

Period end date

December 31, 2018

Allowances allocated

Allowances purchased

Verified emissions in metric tons CO₂e

2,261,728

Details of ownership

Facilities we own and operate

Comment

Allowance information is considered confidential business information.

California CaT

% of Scope 1 emissions covered by the ETS

15

Period start date

January 1, 2018

Period end date

December 31, 2018

Allowances allocated

Allowances purchased

Verified emissions in metric tons CO₂e

2,520,114

Details of ownership

Facilities we own and operate

Comment

Allowance information is considered confidential business information.

EU ETS

% of Scope 1 emissions covered by the ETS

7

Period start date

January 1, 2018

Period end date

December 31, 2018

Allowances allocated

1,270,172

Allowances purchased

0

Verified emissions in metric tons CO₂e

1,239,995

Details of ownership

Facilities we own and operate

Comment

Korea ETS

% of Scope 1 emissions covered by the ETS

Period start date

January 1, 2018

Period end date

December 31, 2018

Allowances allocated

Allowances purchased

Verified emissions in metric tons CO₂e

Details of ownership

Facilities we own and operate

Comment

Allowance and emissions information are considered confidential business information.

C11.1d

(C11.1d) What is your strategy for complying with the systems in which you participate or anticipate participating?

Our current strategy regarding allowance trading under all 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. 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

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

No

C11.3

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

No, and we do not currently anticipate doing so in the next two years

C12. Engagement

C12.1

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

Yes, our suppliers

Yes, our customers

Yes, other partners in the value chain

C12.1a

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

Type of engagement

Engagement & incentivization (changing supplier behavior)

Details of engagement

Other, please specify

Support of supplier efforts to incorporate renewable electricity in energy supplied

% of suppliers by number

0.1

% total procurement spend (direct and indirect)

0.1

% Scope 3 emissions as reported in C6.5

Rationale for the coverage of your engagement

Air Products is engaging with suppliers where renewable energy costs are at, or approaching grid parity.

Impact of engagement, including measures of success

Air Products increased its use of renewable energy in 2018, continuing our journey to identify green energy sources that can reduce our energy costs and environmental footprint. For example, Air Products France is using renewable electricity to produce merchant industrial and medical gases and to power its sales and administrative offices. The renewable electricity is validated by the purchase of GO (Guarantee of Origin) certificates registered on the National Registry for Guarantees of Origin. In 2018 we continued our work with the French multinational electric utility company ENGIE to apply

blockchain technology to trace and certify the green electricity from wind and hydroelectric power sources to the point of use at our L'Isle d'Abeau plant. Wind power is also used in the UK for our merchant gas production through our partnership with Ørsted (formerly DONG Energy), a global leader in offshore wind power. In addition, the UK team is looking at opportunities for on-site energy generation at several facilities. In Asia we use electricity from wind power for our air separation unit in Dalian, China.

Comment

Air Products does not have reliable data available to determine Scope 3 emissions attributable to this activity at this time.

Type of engagement

Information collection (understanding supplier behavior)

Details of engagement

Other, please specify

Review supplier commitments

% of suppliers by number

0.1

% total procurement spend (direct and indirect)

33

% Scope 3 emissions as reported in C6.5

Rationale for the coverage of your engagement

Air Products monitors the state of our supplier's sustainability performance, interests, and projects through direct contact with them and data made publicly available by those companies.

Impact of engagement, including measures of success

Nearly two-thirds of Air Products' top suppliers have programs and/or goals aimed at reducing greenhouse gas emissions and improving energy conservation and efficiency.

Comment

Air Products does not have reliable data available to determine Scope 3 emissions attributable to this activity at this time.

C12.1b

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

Type of engagement

Collaboration & innovation

Details of engagement

Other – please provide information in column 5

% of customers by number

% Scope 3 emissions as reported in C6.5

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

Air Products manufactures gases that enable its customers to improve energy efficiency and reduce emissions. We actively engage with our customers on new products and applications that help them improve energy efficiency and reduce emissions. The percentage of customers engaged in these activities is not tracked centrally.

Impact of engagement, including measures of success

In 2018, 54% of our revenues were related to products and applications that drive value for our customers and help them be more sustainable. Air Products is unable to reliably estimate Scope 3 emissions from the use of our products and therefore cannot estimate the percent of Scope 3 emissions related to this engagement.

C12.1c

(C12.1c) 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 of customer sectors, such as Phase IV of the Emissions Trading System in the EU. In both cases, we seek to ensure that new environmental legislation is constructed so as to respect the environmental value brought by our over-the-fence 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. The measure of success is improved fuel efficiency, which reduces greenhouse gas emissions.

C12.3

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

Direct engagement with policy makers
Trade associations

Funding research organizations
Other

C12.3a

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

Focus of legislation	Corporate position	Details of engagement	Proposed legislative solution
Clean energy generation	Support	As part of the normal legislative process, Air Products directly engages policy makers through consultation and meetings to ensure that developing energy and related policies take appropriate account of the specific characteristics of renewable energy technology that forms the basis of our investment intentions. As an example of those efforts, Air Products has engaged with the UK government on matters concerning the Renewables Obligation Scheme, and the rollout of the Energy Market Reform policy and attendant regulations.	Air Products supports the development and use of renewable, clean energy, and has helped educate policy makers on the benefits of this energy.
Mandatory carbon reporting	Support with minor exceptions	Air Products engages with various agencies on mandatory carbon reporting, particularly the U.S. EPA Greenhouse Gas Reporting Rules (Greenhouse Gas Reporting Rule 40CFR Part 98), California's Regulation for the Mandatory Reporting of Greenhouse Gas Emissions, Ontario Ministry of the Environment and Climate Change, Alberta Environment and Parks and Environment Canada. The company periodically meets directly with regulatory staff, participates in public regulatory workshops and submits formal and informal comments to regulators.	Air Products seeks to ensure reporting methodologies define reasonable measurement requirements, accuracy expectations and alternatives to address missing data points.
Cap and trade	Support with minor exceptions	Through the vehicles of the European Industrial Gas Association (EIGA) and selected European national industrial gases associations, Air Products has responded to consultations and met directly with EU policy-makers to ensure	Air Products seeks comparable treatment under the regulations (e.g., consistent basis for allocation of free allowances) to all producers, regardless of ownership structure, so as to

		that the role of our industry in achieving the aims of EU environmental policies can more easily and more cost-effectively be achieved. One example of this is policies relating to emissions trading.	not unduly disadvantage the over-the-fence supply model.
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C12.3b

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

Yes

C12.3c

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

Trade association

National Association of Manufacturers (NAM)

Is your position on climate change consistent with theirs?

Mixed

Please explain the trade association's position

The National Association of Manufacturers (NAM) has not issued a formal position on climate change but has taken positions on related aspects. In terms of energy, NAM is committed to finding ways to "reduce costs, promote sustainability and develop new energy solutions." From an environmental perspective, NAM is in favor of promoting "a policy environment that fosters lower GHG emissions through technological advancements and innovation by avoiding overly prescriptive regulations that favor certain technologies and fuels over others."

Most recently NAM has supported the Clean Industrial Technology Act that would set up a Transformational Industrial Technology Program at the U.S. Department of Energy to "drive new technologies aimed at increasing the technological and economic competitiveness of manufacturing in the United States. The program would also find pathways to net-zero greenhouse gas emissions and create a technical assistance program to help local communities and states evaluate and incentivize the adoption of technologies that reduce industrial greenhouse gases." Likewise, NAM has unveiled "a new strategic initiative dedicated to the development, deployment and advancement of carbon capture utilization and storage policies and technologies that will support the U.S. manufacturing sector, create jobs and improve the environment."

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

Our management believes that our business, and thus our shareholders, benefit from our participation in an organization that represents U.S. manufacturing in Washington. The members of NAM, like most large trade associations, have a wide range of views, and we do not always agree with all the positions NAM chooses to support. In all cases, any Air Products' public position on a matter of public policy is the prevailing company position, irrespective of any trade association position to the contrary.

C12.3d

(C12.3d) Do you publicly disclose a list of all research organizations that you fund?

No

C12.3e

(C12.3e) Provide details of the other engagement activities that you undertake.

Air Products is engaged in many industry associations around the world that have supportive environmental positions. This includes, but is not limited to, EIGA (European Industrial Gas Association); IFIEC (European Association of Energy-Intensive Industries); EIUG (UK Energy-Intensive Industries Group); AEGE (Spanish Energy-Intensive Industry Group); AFGIM (Spanish Industrial Gases Association); IGV (German Industrial Gases Association); BCGA (British Industrial Gases Association); VNCI (Dutch Chemical Manufacturers' Association); (FCHEA) Fuel Cell and Hydrogen Energy Association; (HTAC) Hydrogen and Fuel Cell Technical Advisory Committee; the Hydrogen Council; and (NAHFC) National Alliance of Hydrogen and Fuel Cell organization.

C12.3f

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

Air Products' Greenhouse Gas Center of Excellence (GHG COE) provides expertise for matters on internal policy development, regulations, and legislation. GHG COE members are directly engaged with policy makers and follow our Employee Code of Conduct requirements. Likewise, the GHG COE provides a forum for broad review of indirect activities the company is undertaking in the climate change arena.

C12.4

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

Publication

In voluntary sustainability report

Status

Complete

Attach the document

 2019-Sustainability-Report.pdf

Page/Section reference

Greenhouse gases and climate change are covered on pages 42-44 of our 2019 Sustainability Report. Three years of environmental data is provided on pages 85-86 of the Report.

Content elements

Governance
Strategy
Risks & opportunities
Emissions figures
Emission targets
Other metrics

Comment

Our 2019 report has been prepared in accordance with GRI standards "core" option and is aimed at providing stakeholders with data and perspectives to understand and evaluate our performance, impacts and opportunities.

Publication

In mainstream reports

Status

Complete

Attach the document

 air-products-ar2018.pdf

Page/Section reference

Risks related to climate change and greenhouse gases are noted on pages 10-13 and page 47.

Content elements

Risks & opportunities

Comment

C14. 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.

C14.1

(C14.1) Provide details for the person that has signed off (approved) your CDP climate change response.

	Job title	Corresponding job category
Row 1	Senior Vice President, Chief Information Officer and Special Advisor to the Chairman	Other C-Suite Officer

SC. Supply chain module

SC0.0

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

Please see the introduction in our 2018 Climate Change response.

SC0.1

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

	Annual Revenue
Row 1	8,930,000,000

SC0.2

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

Yes

SC0.2a

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

ISIN country code (2 letters)	ISIN numeric identifier and single check digit (10 numbers overall)
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Row 1	US	0091581068
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