

**Air Products Response  
Carbon Disclosure Project (CDP7)  
2009 Greenhouse Gas (GHG) Emissions Questionnaire**

## **Company Background**

Air Products (NYSE:APD) serves customers in technology, energy, healthcare and industrial markets worldwide with a unique portfolio of products, services and solutions, providing atmospheric, process and specialty gases; performance materials and equipment and services. Founded in 1940, we have built leading positions in key growth markets and are recognized for our innovative culture, operational excellence and commitment to safety and the environment. With fiscal 2008 annual revenues of over \$10 billion, operations in more than 40 countries, and 21,000 employees, we strive to build lasting relationships with our customers and communities based on understanding, integrity and passion.

Air Products ranks 248th in sales among *FORTUNE* magazine's April 2009 list of the 500 largest corporations in the United States. Corporate headquarters are at our 600-acre campus in eastern Pennsylvania's Lehigh Valley, near Allentown; European headquarters are at Hershram, near London; and Asian headquarters in Singapore and Hong Kong.

This is Air Products' seventh consecutive response to the Carbon Disclosure Project information request. Aligned with our U.S. EPA Climate Leaders Inventory Management Plan, our emissions reporting period is January 1, 2008 to December 31, 2008.

We maintain an open dialogue regarding our environmental performance, as detailed in our Corporate Responsibility and Annual Reports. [Link: [2009 Corporate Responsibility Annual Report](#); Link: [2008 Annual Report](#)].

## **Risks and Opportunities**

From our earliest days as a gases company with atmospheric gas separation at our core, we've delivered technologies and solutions that have contributed to cleaner air, energy efficiency improvements, and safer products for our customers and the communities where we live and operate. In bringing this unique capability and real answers to market problems, our commitment to protect the environment has never wavered. Nearly 70 years later, with the hurdles we all face in protecting the global environment from climate change, we believe the challenge of mitigating greenhouse gases (GHG) must be addressed through a diverse mix of technology solutions.

As such, our strategy for responding to climate change is straight forward – identify opportunities where our core technology and product strengths bring cost-effective solutions and seek to minimize our GHG emissions and the potential cost impact of a carbon-constrained energy supply on our operations through continued technology innovation and energy efficiency. Our Greenhouse Gas (GHG) Strategy Team works with our Sustainability Council to foster exploration of new markets and technologies. Research and development efforts include partnering with appropriate government agencies and industry consortiums around the world to advance new technologies for energy efficiency and carbon capture. With our core strengths as a leading industrial gases and materials company and a culture of product innovation, Air Products is a global leader of technical options for capturing CO<sub>2</sub> from fossil fuel conversion before it reaches the atmosphere – key to Carbon Capture and Sequestration (CCS) for GHG mitigation.

We carefully follow pending climate change regulatory developments around the world and engage with governmental and non-governmental stakeholders to support a balance between economic and environmental objectives.

**Risks:**

**1. Regulatory Risks:**

**1.1 Is your company exposed to regulatory risks related to climate change?**

**Air Products Response:**

**Issue Identification and Management**

*Air Products leverages an existing environmental issues and risk management work process to identify developing regulatory and legislative activity related to climate change. This process is augmented through our membership in trade associations and executive leadership forums, including the Business Environmental Leadership Council of the Pew Center on Global Climate Change (founding member in 1998), the World Business Council for Sustainable Development (WBCSD), the UK Carbon Capture and Storage Association, Canada's Integrated CO2 Network, and other industry organizations, such as the Compressed Gases Association and the European Industrial Gas Association. Through our involvement in these business-led initiatives, we are working to advocate pragmatic policies and solutions for climate change.*

*As shown in the attached chart, the Environmental, Safety and Public Policy Committee of the Board of Directors has formal oversight for environmental performance, including climate change considerations. The VP, EHS&Q, has direct operating responsibility for our climate change policies and GHG inventory programs.*

*Importantly, Air Products has had a multi-disciplinary GHG Strategy Team in place since 2003, which provides preliminary assessment of the potential financial and operating impacts regulatory and legislative activity may have on our businesses and operations. This team, with cross-functional representation, works directly with potentially impacted businesses and supports more detailed analysis of the risks and opportunities. The GHG Strategy Team works closely with Air Products multi-disciplinary Sustainability Council, which reports to the CEO and provides updates to the company's Corporate Executive Committee (the company's eight most senior executives) and the Environmental, Safety and Public Policy Committee of the Board of Directors on the climate change issue. Notably, Air Products recently added GHG and sustainability considerations to core processes such as product development, R&D, EH&S risk assessment and capital spending authorization.*

*We also work closely with our customers to understand the full impact of the issue and to develop cost effective solutions.*

Air Products Entity	GHG Accountability
<b>Board of Directors / Environmental, Safety and Public Policy Committee</b>	Formal oversight for environmental performance goals, including climate change
<b>Vice President, Environmental, Health, Safety and Quality</b>	Direct operating responsibility for climate change policy and GHG inventory programs
<b>Corporate Executive Committee</b>	Regular reviews of climate change risks and opportunities
<b>Greenhouse Gases Strategy Team</b>	Focal point for the corporation on climate change and GHG matters
<b>Sustainability Council</b>	Defines policies, programs and performance indicators for sustainability initiatives, including climate change

### Risk Assessment

*Air Products has operations within jurisdictions that have, or are developing, regulations governing emissions of GHG. Existing and expanding coverage under the EU Emission Trading Scheme (EU ETS), mandatory reporting and reductions at manufacturing facilities in Alberta, Canada, and mandatory reporting and anticipated constraints on GHG emissions in California and Ontario, Canada are current impacts. Additionally, U.S. Federal mandatory GHG emission reporting rules have been proposed that would require reporting from approximately 25 of our U.S. facilities, beginning as early as 2011. We are also closely following the proposed inclusion of GHG emissions under the U.S. EPA Clean Air Act and working documents on climate change legislation being considered by legislative committees of the U.S. Congress.*

*Air Products strives to mitigate potential impacts by working closely with our customers and by engaging at an early stage in the regulatory process to simplify compliance and advocate for an equitable imposition of carbon constraints.*

## 2. Physical Risks:

### 2.1 Is your company exposed to physical risks from climate change?

**Air Products Response:** *Air Products does not have a unique risk profile with respect to potential physical impacts attributed to climate change. Like many companies, we have assets and customers located in coastal zones around the world that could, under conditions of significant sea level rise, be impacted in varying degrees. The probability, magnitude and timing of such physical risks are difficult to quantify with any confidence. Nonetheless, Air Products manages its channels of supply recognizing the potential for business disruption of our own, our suppliers' or our customers' operations.*

*We actively manage all physical risks, including those from extreme weather, regardless of their cause, consistent with our overall*

commercial and asset risk profile, and we have appropriate mitigation and emergency plans in place. Air Products operates in over 40 countries around the world, supplying a diversity of markets. This diversity provides further protection from any dislocations resulting from physical risks potentially attributed to climate change.

### **3. Other Risks:**

#### **3.1 How is your company exposed to other risks as a result of climate change?**

**Air Products Response:** *Air Products' business portfolio has certain defensive characteristics that should help minimize general risks, including those potentially attributed to climate change. Air Products has diversified product offerings, serves broad markets and geographies, and contractually limits its exposure to swings in energy and raw material prices in many of its businesses. Air Products' technologies and products are critical to manufacturing processes in many industries, including: electronics, pulp and paper, medical, food, glass, metals, chemicals, power generation, oil and gas production and refining, adhesives, automotive products, paints and coatings, and building products. The diversity of this customer base further mitigates potential commercial. Importantly, Air Products' continual focus on improving energy efficiency further mitigates other potential risks associated with climate change.*

### **Opportunities:**

### **4. Regulatory Opportunities:**

#### **4.1 Do regulatory requirements on climate change present opportunities for your company?**

**Air Products Response:** *We believe that climate change presents more opportunities for Air Products than commercial risks. We believe governmental actions and public concern regarding the climate change issue will increase demand for technologies that produce cleaner fuels, facilitate alternate fuel source development, encourage solar and other renewable energy development and improve energy efficiency. We have built a reputation for supplying innovative energy technologies and as a leader in the efficient use of power and natural gas. Climate change concerns are already providing us numerous business opportunities.*

*Some of these include:*

- *Oxygen use for oxy-fuel combustion efficiency enhancement applications, which reduce the use of fuel as well as the resulting GHG emissions;*
- *Oxygen for oxy-fuel and gasification to facilitate CO<sub>2</sub> capture and sequestration, especially from large-scale operations such as power/utility boilers [Link: [Full Demonstration of Oxyfuel CCS](#)];*
- *Advanced CO<sub>2</sub> separation technology to facilitate CO<sub>2</sub> capture and sequestration from reforming, gasification and combustion applications [Link: [Air Products CO<sub>2</sub> Capture and Purification Technologies](#)];*

- Innovative ion transport membrane (ITM) technology for high-efficiency oxygen production, enhancing the economic viability of large-scale oxygen applications such as IGCC and oxy-fuel combustion [Link: [Oxygen for Gasification](#)];
- Increased opportunity for energy-integrated natural gas liquefaction, utilizing our state-of-the-art AP-X™ Technology process [Link: [LNG Liquefaction](#)];
- Hydrogen and hydrogen/methane blend fueling technology for mass-transit [Link: [Hydrogen and HCNG](#)] and special use vehicles, such as lift trucks [Link: [Hydrogen Lift Trucks](#)];
- High purity process gases and cleaning agents facilitating production of the latest generation of photovoltaic solar energy cells to meet an increased demand for renewable energy sources [Link: [SunSource™ Solutions for Photovoltaic Manufacturing](#)];

*These, and other technology solutions that address climate change concerns, are described on Air Products [website](#).*

## **5. Physical Opportunities:**

### **5.1 Do physical changes resulting from climate change present opportunities for your company?**

**Air Products Response:** *Air Products is a technology solutions provider, and as such, expects to provide solutions to help to mitigate the physical changes resulting from climate change. Such physical changes will amplify the needs for energy and environmental solutions like those detailed in the answer for question 4.1.*

## **6. Other Opportunities:**

### **6.1 Does climate change present other opportunities for your company?**

**Air Products Response:** *Air Products is well positioned to respond to commercial opportunities resulting from the global response to the climate change issue. Air Products is a leading solution provider for energy intensive industries, providing efficiency and environmental enhancements to our customers' processes and operations. We continue to make strategic, focused investments in technology development that can yield GHG reduction benefits for our own operations and those of our customers.*

## **Greenhouse Gas Emissions Accounting, Emissions Intensity, Energy and Trading**

### **7. Reporting Year:**

**7.1 Please state the start date and end date of the year for which you are reporting GHG emissions.**

**Air Products Response:** *Aligned with our U.S. EPA Climate Leaders Inventory Management Plan, our estimated emissions reporting period is January 1, 2008 to December 31, 2008.*

*Air Products reported last year's CDP emissions based on calendar year 2007. Previous inventory reporting was fiscal-year based – October 1<sup>st</sup> to September 30<sup>th</sup> – for the two years prior to calendar year 2007.*

### **8. Reporting Boundary:**

**8.1 Please indicate the category that describes the company, entities or group for which Scope 1 and Scope 2 emissions are reported.**

- **Companies over which financial control is exercised – per consolidated audited Financial Statements.**
- **Companies over which operational control is exercised.**
- **Companies in which an equity share is held.**
- **Other (please provide details).**

**Air Products Response:** *Air Products employs the Financial Control criteria (per WRI Protocol/U.S. EPA Climate Leaders) for including emissions in our annual Scope 1 and Scope 2 GHG emissions report. Consistent with the Climate Leaders Design Principles, We count the full GHG emissions of an operation where we have the ability to direct financial and operating polices. In such cases, we retain the majority of risks and rewards of ownership of the operations' assets. This designation of financial control is consistent with Air Products accounting practices.*

*This is the same basis employed for all our prior CDP reporting.*

**8.2 Please state whether any parts of your business or sources of GHG emissions are excluded from your reporting boundary.**

**Air Products Response:** *Air Products strives to compile a complete GHG emission inventory, including all company controlled assets, regardless of whether Air Products or a customer provides the energy or feedstock necessary for an operating asset.*

## 9. Methodology:

### 9.1 Please describe the process used by your company to calculate Scope 1 and Scope 2 GHG emissions including the name of the standard, protocol or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 GHG emissions.

**Air Products Response:** *Air Products calculates its corporate-wide emissions using the U.S. EPA Climate Leaders GHG Inventory Guidance, which defines how partner companies inventory and report their GHG emissions. This Guidance is based on the existing GHG Protocol Corporate Accounting and Reporting Standard developed by the World Resources Institute (WRI) and the WBCSD. Climate Leaders GHG Inventory Guidance details methodologies for quantifying emissions from Scope 1 and Scope 2 emissions. Climate Leaders accepted our formal Inventory Management Plan in May 2008. In addition, The Climate Leaders' technical staff reviewed our calculation process, emission factors and assumption used for the estimate, and validated the data compilation work process through visits to five of our operating sites.*

*Air Products has compiled and reported GHG emissions through the CDP response for the past seven years. In the most recent three years, the reporting basis has followed the EPA guidance, leading to the assessment and validation of our inventory process by U.S. EPA Climate Leaders program for our CY2007 inventory.*

### 9.2 Details of any assumptions made.

**Air Products Response:** *Consistent with WRI/WBCSD and Climate Leaders Design Principles, we strive to provide the most complete view of our emissions profile that we can. This includes the emissions resulting from all energy and/or feedstock consumption, regardless of whether Air Products or a customer provides the energy or feedstock.*

*For example, our inventory includes an estimate of the indirect emissions from small air separation plants located on customer sites where we do not purchase the required power to operate the facilities. In these instances, power consumption is estimated based on an engineering relationship that assumes continuous operation at full capacity – a conservative assumption.*

*This assumption was used for calendar year 2007 reporting, but not in the prior years.*

### 9.3 The names of and links to any calculation tools used.

**Air Products Response:** *Air Products has developed a proprietary, customized spreadsheet-based system to compile energy consumption and process data, as well as perform the necessary calculations of GHG emissions.*

#### 9.4 The global warming potentials you have applied and their origin.

**Air Products Response:** *The GWP values used for Air Products GHG Inventory are:*

<b>CH4</b>	<b>21</b>
<b>N<sub>2</sub>O</b>	<b>310</b>
<b>CF4</b>	<b>6,500</b>
<b>C2F6</b>	<b>9,200</b>
<b>SF6</b>	<b>23,900</b>

*These values are from the U.S. Inventory of Greenhouse Gas Emission and Sinks 1990-2000 (EPA 2002). This is the same basis employed for our most recent three years of CDP reporting.*

#### 9.5 The emission factors you have applied and their origin.

**Air Products Response:** *As detailed in our U.S. EPA Climate Leaders Inventory Management Plan, Air Products uses the CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O emissions factors from the Climate Leaders Stationary Sources Guidance document. U.S. electricity GHG emission factors are from the EPA eGrid Subregion Rates (2007 version 1.1, January 2009), and International electricity factors are from the International Energy Agency (2005 Update). This is the same basis employed for our prior three years of CDP reporting.*

### 10. Scope 1 Direct GHG Emissions:

#### 10.1 Total gross global Scope 1 GHG emissions in metric tonnes of CO<sub>2</sub>-e

**Air Products Response:** *Global Scope 1 emissions for the past two reporting years are:*

Calendar Year 2008	12.3 million metric tonnes CO <sub>2</sub> -e
Calendar Year 2007	12.3 million metric tonnes CO <sub>2</sub> -e

*\* Note: Values restated 7/15/09 based on correction of joint venture ownership status of existing facilities.*

#### 10.2 Scope 1 GHG emissions broken down by county

**Air Products Response:** *We develop our GHG Emission Inventory on a facility- specific basis. Database attributes for each facility include region, country, state/province, power grid region, business unit and activity. We have historically reported GHG emissions only on a global basis; however, we are providing a breakdown of emissions by region this year for greater transparency. However, further breakdown of these emissions would reveal business confidential market share information.*

*CY08 Scope 1 emissions, by region are:*

<i>North America</i>	<i>10.4 million metric tonnes CO<sub>2</sub>-e</i>
<i>South America</i>	<i>0.2 million metric tonnes CO<sub>2</sub>-e</i>
<i>Europe</i>	<i>1.7 million metric tonnes CO<sub>2</sub>-e</i>
<i>Asia</i>	<i>0.2 million metric tonnes CO<sub>2</sub>-e</i>

*\* Note: Rounding results in the sum of regional emissions differing from the global total.*

*\*\* Note: Values restated 7/15/09 based on correction of joint venture ownership status of existing facilities.*

### **10.3 Scope 1 GHG emissions broken down by business division and/or**

**Air Products Response:** *We develop our GHG Emission Inventory on a facility-specific basis. Database attributes for each facility include region, country, state/province, power grid region, business unit and activity. For CY08, we have reported GHG emissions on global and regional bases. However, further breakdown of these emissions would reveal confidential business information.*

### **10.4 Scope 1 GHG emissions broken down by facility**

**Air Products Response:** *We develop our GHG Emission Inventory on a facility-specific basis. Database attributes for each facility include region, country, state/province, power grid region, business unit and activity. For CY08, Air Products has reported GHG emissions on global and regional bases. However, further breakdown of these emissions would reveal confidential business information.*

### **10.5 Scope 1 GHG emissions reported separately by individual GHG type – in metric tonnes of the gas and metric tonnes of CO<sub>2</sub>-e.**

**Air Products Response:** *We develop our GHG Emission Inventory using composite emissions factors; that is, the contribution (and appropriate GWP) of minor combustion byproduct CH<sub>4</sub> and N<sub>2</sub>O have been added to the appropriate fuel combustion and electricity factors in order to tally a total CO<sub>2</sub>-e emission estimate for each facility/source. Where process emissions of CH<sub>4</sub>, N<sub>2</sub>O or other GHGs occur, they are accounted for discretely. As such, Air Products provides information on a cumulative CO<sub>2</sub>-e basis.*

## **11. Scope 2 Direct GHG Emissions:**

### **11.1 Total gross global Scope 2 GHG emissions in metric tonnes of CO<sub>2</sub>-e**

**Air Products Response:** *Global Scope 2 emissions for the past two reporting years are:*

Calendar Year 2008      8.9 million metric tonnes CO<sub>2</sub>-e

Calendar Year 2007      9.1 million metric tonnes CO<sub>2</sub>-e

*\* Note: Values restated 7/15/09 based on correction of joint venture ownership status of existing facilities and updating of e-Grid electricity factors.*

### **11.2 Scope 2 GHG emissions broken down by county**

**Air Products Response:** *We develop our GHG Emission Inventory on a facility-specific basis. Database attributes for each facility include region, country, state/province, power grid region, business unit and activity. We have historically reported GHG emissions on only a global basis. For greater transparency, we are providing a breakdown of emissions on a regional basis, as well this year. However, further breakdown of these emissions would reveal business confidential market share information.*

CY08 Scope 2 emissions, by region are:

North America	5.0 million metric tonnes CO <sub>2</sub> -e
South America	<0.1 million metric tonnes CO <sub>2</sub> -e
Europe	1.4 million metric tonnes CO <sub>2</sub> -e
Asia	2.5 million metric tonnes CO <sub>2</sub> -e

*\* Note: Values restated 7/15/09 based on correction of joint venture ownership status of existing facilities and updating of e-Grid electricity factors.*

### **11.3 Scope 2 GHG emissions broken down by business division and/or**

**Air Products Response:** *We develop our GHG Emission Inventory on a facility-specific basis. Database attributes for each facility include region, country, state/province, power grid region, business unit and activity. For CY08, we have reported GHG emissions on global and regional bases. However, further breakdown of these emissions would reveal confidential business information.*

### **11.4 Scope 2 GHG emissions broken down by facility**

**Air Products Response:** *We develop our GHG Emission Inventory on a facility-specific basis. Database attributes for each facility include region, country, state/province, power grid region, business unit and activity. For CY08, Air Products has reported GHG emissions on global and regional bases. However, further breakdown of these emissions would reveal confidential business information.*

## **12. Contractual Arrangements Supporting Particular Types of Electricity Generation:**

**12.1 If you consider that the average grid factor used to report Scope 2 emissions in question 11 above does not reflect the contractual arrangements you have with electricity suppliers (for example, because you purchase electricity using a zero or low carbon electricity tariff), you may calculate and report a contractual Scope 2 figure in response to this question, showing the origin of the alternative emission factors and information about the tariff.**

**Air Products Response:** *Air Products considers the appropriate (region or county average) grid factors used to report Scope 2 emissions to be representative of all electricity purchased or self-produced. This is the same basis employed for our most recent three years of CDP reporting.*

**12.2 If you retire any certificates (e.g. Renewable Energy Certificates) associated with zero or low carbon electricity, please provide details.**

**Air Products Response:** *Air Products did not retire any Renewable Energy Certificates, or comparable zero- or low-carbon electricity certificates.*

## **13. Scope 3 Other Indirect GHG Emissions:**

### **13.1 Employee business travel**

**Air Products Response:** *Air Products does not currently estimate Scope 3 emissions.*

### **13.2 External distribution/logistics**

**Air Products Response:** *Air Products does not currently estimate Scope 3 emissions.*

### **13.3 Use/disposal of company's products and services**

**Air Products Response:** *Our products are used in a broad range of applications under a myriad of operating conditions controlled by our customers. Air Products does not measure the GHG emissions associated with the use or disposal of our products. This is primarily because most of our industrial gas products, like hydrogen, oxygen, nitrogen and argon, do not result in downstream GHG emissions when used or disposed by our customers. In fact, uses of our products can contribute significantly to our customers' ability to decrease their GHG emissions by making their processes more energy efficient. For example, the use of oxygen to replace combustion air in high temperature furnaces (e.g. glass manufacturing) actually decreases GHG emissions because of improved energy efficiency from not having to heat up all the atmospheric nitrogen present in normal combustion air. Examples of such supply chain benefits are highlighted on our corporate [website](#).*

### **13.4 Company supply chain**

**Air Products Response:** *Air Products does not currently estimate Scope 3 emissions.*

*On the upstream portion of our supply chain, we work closely with our energy suppliers to make the most efficient use of their generation facilities to help them minimize GHG emissions. For example, we use state-of-the-art technology to match our energy needs to other demands on the energy supplier by shutting down our production at times of peak demand and loading up production at other times. This 'demand loading' optimizes the generation efficiency of the power plant by ensuring it runs as close as possible to the point of maximum efficiency.*

*Air Products also requires energy efficiency improvements from its service providers. An example is the addition of "Fleet board" fuel consumption monitoring equipment on the truck fleet used by our contract Merchant Gas delivery vendor.*

### **13.5 Other**

**Air Products Response:** *Air Products does not currently estimate Scope 3 emissions.*

**13.6 If you have provided information about one or more of the categories of Scope 3 GHG emissions in response to the questions above, please explain your reasons and describe any plans you have for collecting Scope 3 indirect emissions information in the future.**

**Air Products Response:** *Air Products does not currently have the collection systems accurately compile and calculate estimated Scope 3 emissions. Further enhancements to our data compilation work process will be considered in the future.*

## **14. Emission Avoided Through use of Goods and Services:**

**14.1 If your goods and/or services enable GHG emissions to be avoided by a third party, please provide details including the estimated avoided emissions, the anticipated timescale over which the emissions are avoided and the methodology, assumptions, emission factors (including sources) and global warming potentials (including sources) used for your estimations.**

**Air Products Response:** *Air Products offers many technologies and products which improve our customers' efficiency and reduces their environmental footprint.*

**Oxy-fuel** - *One of the most significant energy efficiency benefits Air Products facilitates through its supply chain is the application of oxy-fuel technology to combustion systems, typically for the glass, steel aluminum and cement industries. Combusting fuels with pure oxygen or oxygen-enriched air improves energy efficiency relative to air-only combustion. This efficiency improvement means less fuel is consumed and less CO<sub>2</sub> is emitted. In addition, oxy-fuel technology significantly reduces other air pollutants as well, particularly NO<sub>x</sub> and particulate emissions.*

*Air Products estimates that **1 million metric tonnes of CO<sub>2</sub> emission reductions are achieved each year** at oxy-fuel or oxygen enrichment installations provided by Air Products, even after accounting for the indirect CO<sub>2</sub> emissions required to produce the oxygen utilized in the oxyfuel applications. [This estimate is based on sales volumes into the oxy-fuel market and demonstrated energy efficiency improvements at customer facilities. The GHG emissions reduction is principally CO<sub>2</sub>, with a GWP of 1.0.]*

**Energy Integrated Liquefied Natural Gas (LNG) Solutions** - *Air Products supplies air separation units with proprietary heat exchangers to produce industrial gases in conjunction with the reuse of cold energy from vaporization of LNG before it enters the pipeline distribution system. This cold energy is typically wasted through heat exchange with nearby ocean water which would also result in undesirable reductions in local ocean body temperatures. Reuse of this cold energy to produce liquefied atmospheric gases such as liquid nitrogen and oxygen can reduce the electrical power requirements by as much as 50-60%. Air Products has entered into a joint venture to bring the first plant of this kind to China.*

*Air Products estimates that 120,000 metric tonnes of CO<sub>2</sub> emissions reductions will be achieved each year at ASUs reusing LNG cold energy supplied by Air Products*

*Other examples of GHG reductions achieved through application of Air Products' products and technologies include:*

- *Argon gas is used to create an insulating barrier within multi-pane glass, reducing energy losses in residential and commercial buildings.*
- *Specialty gases used in the manufacturing of photovoltaic cells, leading to lower cost renewable power sources.*
- *Air Products is the leading provider of natural gas liquefaction technology and equipment. This technology allows greater use of natural gas, replacing higher GHG emitting fuels.*
- *Air Products family of polyurethane additives are key components of foam insulation systems, enhancing the efficiency of appliances and buildings. See our corporate [website](#) for more information.*

## **15. Carbon Dioxide Emissions from Biologically Sequestered Carbon:**

### **15.1 Please provide the total global carbon dioxide emissions in metric tonnes CO<sub>2</sub> from biologically sequestered carbon.**

**Air Products Response:** *The portion of Air Products total CO<sub>2</sub> emissions that is attributed to biologically sequestered carbon is limited to the natural rubber portion of tire-derived fuels burned in a solid fuel cogeneration facility in Stockton, California. In calendar year 2008, this amounted to approximately 1,000 metric tonnes.*

*In addition, Air Products has recently conducted test burns of additional solid fuels of higher biologically sequestered carbon content, and hopes to burn larger quantities of them on a regular basis in the future. In CY08, these test burns accounted for 5,900 metric tonnes of fuel and over 11,000 metric tonnes of CO<sub>2</sub> emissions.*

*The total emissions of biologically sequestered carbon in calendar year 2008 are 12,000 metric tonnes of CO<sub>2</sub> emissions.*

## 16. Emissions Intensity:

16.1 Please provide a financial emissions intensity measurement for the reporting year for your combined Scope 1 and 2 emissions, including a description of the measurement.

16.1.1 The units, and

16.1.2 The resulting figure

**Air Products Response:** *Air Products GHG emission intensity is summarized below:*

<b>Scope 1 &amp; 2 Emissions</b> <i>(metric tonnes CO<sub>2</sub>-e)</i>	<b>Revenue</b> <i>(Q2-4 FY08, Q1FY09)</i>	<b>Emissions Intensity</b> <i>(metric tonnes CO<sub>2</sub>-e per \$Million Revenue)</i>
21,300,000	US\$10,150,000,000	2,100

16.2 Please provide an activity related intensity measurement for the reporting year for your combined Scope 1 and 2 emissions, including a description of the measurement.

16.2.1 The units, and

16.2.2 The resulting figure

**Air Products Response:** *Air Products has a very diverse business portfolio with widely varying GHG intensities. As such, using a common denominator of sales revenue would disproportionately impact individual business units due to currency exchange and energy cost fluctuations. We have established intensity factors that recognize our businesses' unique efficiency drivers. While such metrics provide effective yardsticks for assessing efficiency improvements, their complexity and business confidentiality do not lend themselves to public reporting.*

## 17. Emissions History:

17.1 Do emissions for the reporting year vary significantly compared to previous years? If so, please explain why.

**Air Products Response:** *Air Products GHG emissions closely track the volume of hydrogen sold (Scope 1) and volume of oxygen, nitrogen and argon produced (Scope 2). Air Products has seen increases in GHG emissions in previous years due to significant expansions of these two business activities. This past year showed off-setting production volumes and hence a relatively minor change in GHG emissions from the previous calendar year.*

*After adjusting both calendar years 2007 and 2008 for corrections to the joint venture status of existing facilities, calendar year 2008 direct emissions remained essentially unchanged from 2007, as increased production at some of our hydrogen plants was offset by production interruptions in hurricane-affected regions. Calendar year 2008 indirect emissions decreased by 0.2 million metric tons, as lower electricity factors more than compensated for a more complete accounting of our onsite ASUs. Overall, 2% of the reported 2008 emissions are attributed to improved inventory methodology.*

**17.1.1 Estimate the percentage by which emissions vary compared with the previous reporting year.**

**Air Products Response:** *The difference between Air Products total (Scope 1 and Scope 2) GHG emissions between calendar year 2007 and 2008 was <1.0%.*

**18. External Verification/Assurance:**

**18.1 Has any of the information reported in response to questions 10 - 15 been externally verified/assured in whole or in part?**

**Air Products Response:** *Through review and acceptance of calendar year 2007 as our Base Year Inventory under the U.S. EPA's Climate Leaders program, our inventory process has been thoroughly reviewed. Air Products received technical assistance from EPA in determining organizational and operational boundaries, identifying the most appropriate emission factors for our industry, and documenting these decisions in an Inventory Management Plan (IMP) that will ensure consistency and transparency over time. EPA performed a comprehensive desktop review of both the inventory data and IMP to ensure they meet EPA's quality standards, and also conducted on-site IMP reviews at five of our manufacturing sites to ensure that the IMP is being properly implemented at the facility level. These reviews provide assurance to EPA that a well-implemented GHG data collection and management system is in place. Additionally, the calendar year 2008 inventory was reviewed and approved by the EPA Climate Leaders program in June 2009.*

*In addition, compliance management under the EU ETS requires formal auditing of cogeneration facilities in the Netherlands. These audits have been routinely completed in a timely manner, as required under the ETS.*

**18.2 State the scope/boundary of emissions included within the verification/assurance exercise.**

**Air Products Response:** *Air Products entire global GHG emissions inventory is prepared under the auspices of our Inventory Management Plan that was validated by U.S. EPA Climate Leaders Program.*

*The formal verification performed under the EU ETS Phase 2 is limited to two cogeneration facilities in the Netherlands, representing 0.45 million metric tonnes of direct emissions.*

**18.3 State what level of assurance (e.g. reasonable or limited) has been given.**

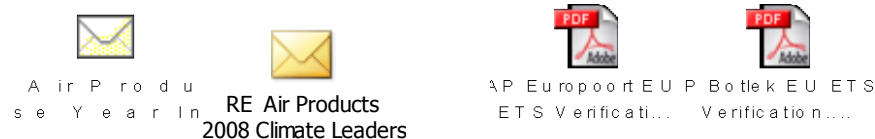
**Air Products Response:** *EPA Climate Leaders validation of the Inventory Management Plan is an informal level of assurance.*

*Verification of the two facilities currently covered under the EU ETS is according to the legal requirements in Commission Decision of 29/01/2004 establishing guidelines for the monitoring and reporting of*

greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council. These verifications were deemed reasonable.

#### 18.4 Provide a copy of the verification statement.

**Air Products Response:** Air Products is attaching a copy of the 2008 email from U.S. EPA confirming the successful completion of the 2007 base year reporting requirements, including acceptance of our Inventory Management Plan, the 2009 email from U.S. EPA contractor approving our 2008 inventory report, and the most recent EU ETS verification statements for our Botlek and Europoort, Netherlands co-generation facilities.



#### 18.5 Specify the standard against which the information has been verified/assured.

**Air Products Response:** The GHG emissions data submitted under Climate Leaders is reviewed against the Climate Leaders GHG Inventory Guidance, which is based on the Corporate Accounting and Reporting Standard developed by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD).

Verification of our two cogeneration facilities currently covered under the EU ETS is according to the legal requirements in Commission Decision of 29/01/2004 establishing guidelines for the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council.

### 19. Data Accuracy:

#### 19.1 What are the main sources of uncertainty in your data gathering, handling and calculations e.g. data gaps, assumptions, extrapolation, metering/measurement inaccuracies, etc.?

**Air Products Response:** Our EPA Climate Leaders Inventory Management Plan describes all institutional, managerial, and technical work processes implemented for the collection of data, preparation of the inventory, and implementation of steps to manage inventory quality. The primary objective of an Inventory Management Plan (IMP) is ensuring the credibility and consistency of the company's GHG inventory information. The IMP discusses assumptions and potential errors and how they are managed.

As we aim to provide the most complete view of our emissions' profile that we can, we also account for power used by our facilities but purchased by our customers. This results in an assumption on the treatment of small air separation plants located on customer sites where

*we do not purchase the required power to operate the facilities. In these instances, power consumption is estimated based on an engineering relationship that assumes continuous operation at full capacity – a conservative assumption.*

*Data gaps and potential inaccuracies are believed to include the characterization of certain feedstock and fuels through limited analysis frequency. Such feedstocks and fuel streams can change composition periodically and may differ from the small set of analysis relied upon for the inventory. The second potential error is the transposition of manually entered data. Upon completion of the inventory estimate, we use an error-checking process to compare year-on-year emissions at the facility level and identify all significantly different results. We then confirm the correct data entry, data source, and ultimately, the emission calculation.*

**19.2 How do these uncertainties affect the accuracy of the reported data in percentage terms or an estimated standard deviation?**

**Air Products Response:** *The small air separation unit category represents approximately 6% of our total GHG emissions. Any overestimation of GHG emissions from these sources is believed to have less than a 2% impact on overall inventory accuracy.*

**19.3 Does your company report GHG emissions under any mandatory or voluntary reporting scheme (other than CDP) that requires an accuracy assessment?**

**19.3.1 The name of the scheme**

**Air Products Response:** *We report GHG emission under three mandatory reporting schemes and two voluntary reporting schemes. The mandatory schemes are:*

- *EU ETS (Phase 1 and 2) – An accuracy assessment is a required component within the guidelines for the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council.*
- *Alberta Large Final Emitters – Alberta’s program allows a maximum error of 5% for the total facility emissions, verified by an independent, certified verifier. Verification begins with the baseline year reporting, designated as the third full year of operation for new facilities. Our facility subject to this rule will establish its baseline year in calendar year 2009.*
- *California Mandatory Reporting – Once the program reaches its second year of reporting (calendar year 2009), a maximum error of 5% of the total facility emissions is required, verified by an independent, certified verifier.*

*The voluntary reporting schemes are:*

- *U.S. EPA Climate Leaders Program – an accuracy assessment is included in the Inventory Management Plan*
- *American Chemistry Council – Responsible Care Metrics reporting – no accuracy assessment is required. The reported data is a subset of the total inventory compiled under the Climate Leaders Program, so it reflects the same assumptions, potential error sources, and underlying accuracy.*

**19.3.2 The accuracy assessment for GHG emissions reported under that scheme for the last report delivered.**

**Air Products Response:** *The formal EU ETS verifications, which represent adherence to the monitoring and accuracy assessment requirements, are attached under question 18.4.*

**20. Energy and Fuel Requirements and Costs:**

**Cost of Purchased Energy**

**20.1 The total cost of electricity, heat, steam, and cooling purchased.**

**Air Products Response:** *The global total cost for all purchased energy (electricity, heat, steam, cooling and fossil fuels/feedstocks) in calendar year 2008 is \$2.5 billion US. Air Products Corporate Energy Group tracks all electricity and fuel/feedstock purchases. This group contracts with suppliers to insure the best cost and terms of supply are achieved, contributing to the company's financial performance. While Air Products tracks these key manufacturing inputs by type, region, county and business area, separate reporting of "Energy" versus "Fuel" costs (Questions 20.1 and 20.2) would allow per unit costs for energy purchases to be determined, commercial information Air Products considers confidential business information.*

**20.1.1 By individual energy type.**

**Air Products Response:** *Air Products Corporate Energy Group tracks all electricity and fuel/feedstock purchases. This group contracts with suppliers to insure the best cost and terms of supply are achieved, contributing to the company's financial performance. While Air Products tracks these key manufacturing inputs by type, region, county and business area, separate reporting of "Energy" versus "Fuel" costs (Questions 20.1 and 20.2) would allow per unit costs for energy purchases to be determined, commercial information Air Products considers confidential business information.*

**Cost of Purchased Fuel**

**20.2 The total cost of fuel purchased by your company for mobile and stationary combustion.**

**Air Products Response:** *The global total cost for all purchased energy (electricity, heat, steam, cooling and fossil fuels/feedstocks) in calendar year 2008 is \$2.5 billion US. Air Products Corporate Energy Group tracks all electricity and fuel/feedstock purchases. This group contracts with suppliers to insure the best cost and terms of supply are achieved, contributing to the company's financial performance. While Air Products tracks these key manufacturing inputs by type, region, county and business area, separate reporting of "Energy" versus "Fuel" costs (Questions 20.1 and 20.2) would allow per unit costs for energy purchases to be determined, commercial information Air Products considers confidential business information.*

### 20.2.1 By individual fuel type.

**Air Products Response:** *Our Corporate Energy Group tracks electricity and fuel/feedstock purchases and contributes to the company's financial performance by contracting with suppliers to ensure the best possible cost and terms of supply. While Air Products tracks these key manufacturing inputs by type, region, county and business area, separate reporting of "Energy" versus "Fuel" costs (Questions 20.1 and 20.2) would allow per unit costs for energy purchases to be determined, commercial information Air Products considers confidential business information.*

### **Energy and Fuel Inputs**

### 20.3 Your company's total consumption of purchased energy in MWh.

**Air Products Response:** *Air Products purchases negligible amounts of steam, heat or cooling, so the total energy consumption reported solely reflects electricity consumption. For clarity, the Purchased Energy value excludes electricity purchased directly by some customers for small on-site air separation systems owned and operated by Air Products. An estimated value for non-purchased electricity is provided separately, as Customer Provided Energy.*

*For calendar year 2008:*

- *Purchased Energy* 12.1 million MWh
- *Customer Provided Energy* 3.1 million MWh

### **Purchased and Self Produced Fuel Input**

### 20.4 Your company's total consumption in MWh of fuels for stationary combustion only. This includes purchased fuels, as well as biomass and self-produced fuels where relevant.

**Air Products Response:** *Air Products counts fossil fuel feedstock and fuel together for our largest fossil fuel consuming processes, so the total purchased and self-produced fuel input actually reflects fuel and feedstock. The global total for all fuel/feedstock consumption in calendar year 2008 is 55 million MWh.*

### 20.4.1 By individual fuel type.

**Air Products Response:** *Air Products Corporate Energy Group tracks all electricity and fuel/feedstock purchases. This group contracts with suppliers to insure the best cost and terms of supply are achieved, contributing to the company's financial performance. While Air Products tracks these key manufacturing inputs by type, region, county and business area, we do not publish this level of detail as it would reveal confidential business information. Instead, a global total for all fuel/feedstock consumption in calendar year 2008 is reported under question 20.4.*

### **Energy Output**

**20.5 What is the total amount of energy generated in MWh from the fuels reported in question 20.4**

**Air Products Response:** *Via cogeneration, Air Products produces electricity and steam at six facilities, through both stand-alone units and integrated hydrogen/cogeneration process configurations. Steam is produced for captive use and export at more than 25 hydrogen generation facilities. All of the fuel required to produce this steam and electricity, and the emissions resulting from production, have been accounted for in the relevant CDP questions. Energy generated from these facilities is business confidential.*

**20.6 What is the total amount in MWh of renewable energy, excluding biomass, that is self-generated by your company?**

**Air Products Response:** *Air Products did not self-generate renewable energy in calendar year 2008.*

### **Energy Exports**

**20.7 What percentage of the energy reported in response to question 20.5 is exported/sold by your company to the grid or to third parties?**

**Air Products Response:** *Air Products produces and exports electricity and steam at six cogeneration facilities and steam at more than 25 additional hydrogen facilities around the world. Energy generated from these facilities is business confidential.*

**20.8 What percentage of the renewable energy reported in response to question 20.6 is exported/sold by your company to the grid or to third parties?**

**Air Products Response:** *Air Products did not self-generate renewable energy in calendar year 2008.*

## **21. EU Emissions Trading Scheme:**

**21.1 Does your company operate or have ownership of facilities covered by the EU Emissions Trading Scheme (EU ETS)? If yes, please give details of:**

**Air Products Response:** *Yes*

**21.2 The allowances allocated for free for each year of Phase II for facilities which you operate or own. (Even if you do not wholly own facilities, please give the full number of allowances).**

**Air Products Response:** *Air Products is allocated 474,700 allowances for two facilities covered under Phase II of EU ETS for the years 2008, 2009, and 2010.*

**21.3. The total allowances purchased through national auctioning processes for the period 1 January 2008 to 31 December 2008 for facilities that you operate or own. (Even if you do not wholly own facilities, please give the total allowances purchased through auctions by the facilities for this period).**

*Air Products Response: No allowances were purchased in 2008.*

**21.4. The total CO<sub>2</sub> emissions for 1 January 2008 to 31 December 2008 for facilities which you operate or own. (Even if you do not wholly own facilities, please give the total emissions for this period.)**

*Air Products Response: Air Products' CY08 emissions from the two covered facilities under EU ETS Phase II were 445,318 metric tonnes CO<sub>2</sub>-e.*

## **22. Emissions Trading:**

**22.1. Please provide details of any emissions trading schemes, other than the EU ETS, in which your company already participates or is likely to participate within the next two years.**

*Air Products Response: Other than EU ETS, Air Products has not participated in any CO<sub>2</sub> emission trading schemes, to date. Within the next two years, Air Products may elect to participate in the Alberta CO<sub>2</sub> trading scheme in order to satisfy anticipated emission reduction targets.*

**22.2. What is your overall strategy for complying with any schemes in which you are required or have elected to participate, including the EU ETS?**

*Air Products Response: Our current strategy regarding allowance trading under EU ETS is to properly manage the compliance obligation of our facilities. Air Products is not trading allowances speculatively.*

**22.3. Have you purchased any project-based carbon credits? If so, please indicate whether the credits are to meet one or more of the following commitments:**

- Primarily for compliance purposes,
- Primarily for voluntary offsetting of your own emissions,
- Other (please describe).

*Air Products Response: Air Products has not purchased any project-based carbon credits to date.*

**22.4 Provide details including the type of unit, volume and vintage purchased and the standard/scheme against which the credits have been verified, issued and retired (where applicable).**

*Air Products Response: Not applicable.*

**22.5. Have you been involved in the origination of project-based carbon credits? If so:**

*Air Products Response: Air Products has not been an originator of any project-based carbon credits to date.*

**22.6. Please provide details including:**

- Your role in the project(s),
- The locations and technologies involved,
- The standard/scheme under which the projects are being/have been developed,
- Whether emissions reductions have been validated or verified,
- The annual volumes of generated/projected carbon credits,
- Retirement method if used for own compliance or offsetting.

*Air Products Response: Not applicable.*

**22.7. Are you involved in the trading of allowances under the EU ETS and/or project-based carbon credits as a separate business activity, or in direct support of a business activity such as investment fund management or the provision of offsetting services? If so:**

**22.8. Please provide details of the role performed.**

*Air Products Response: Air Products is not involved in trading of allowances under EU ETS (or any other trading scheme) as a separate business activity or in direct support of an investment fund or offsetting service. We trade allowances to properly manage the compliance obligation of our facilities. We manage the day-to-day impact on these facilities in an integrated way with other permits and regulatory operating constraints. By production forecasting, planning and integration with our customers' supply chain, we are able to balance our requirements for the necessary allowances, which are accounted for in the normal way via our audited accounts.*

## **Performance**

**23. Reduction Plans:**

**23.1 Does your company have a GHG emissions and/or energy reduction plan in place?**

*Air Products Response: This year, Air Products developed and set new energy and GHG emission metrics and established primary energy reduction goals. These energy reduction goals are intensity-based, and a comparable set of GHG emission reduction goals are being derived from them. In order to achieve these goals, a cross-disciplinary team, headed by our Vice President of Global Operation and Vice President of EHS&Q, was commissioned in 2008 to provide corporate-wide recommendations on accelerating efficiency improvements, reducing our energy intensity and setting and achieving our energy reduction goals. Air Products' Plant Productivity Engineering, a team of over 65 professionals, provides the technical resources to identify and implement the energy reduction opportunities to achieve our goals.*

## **Goal Setting**

### **23.3 Do you have an emissions and/or energy reduction target(s)?**

**Air Products Response:** *Air Products has set two energy reduction goals and is currently developing GHG emission reduction goals coordinated with these energy reduction goals. These goals have been published on page 18 of our [2009 Corporate Responsibility Annual Report](#).*

*In 2006, we joined the U.S. EPA Climate Leaders program to enhance our GHG inventory process, improve the completeness and accuracy of our emissions estimate, and establish a baseline year from which to assess emission reduction targets. Our 2007 emission inventory has been accepted by Climate Leaders as our baseline year. Air Products is currently working with Climate Leaders to establish GHG emission reduction targets based on our energy reduction goals that are appropriate for our business portfolio. Air Products and Climate Leaders staff expect to announce the new GHG reduction goal at the December 2009 U.S. EPA Climate Leaders meeting.*

### **23.4 What is the baseline year for the target(s)?**

**Air Products Response:** *Our baseline year for reduction targets is calendar year 2007. This is consistent with our baseline year GHG inventory approved by U.S. EPA Climate Leaders.*

### **23.5 What is the energy and/or emission reduction target(s)?**

**Air Products Response:** *Air Products has set two energy reduction targets. For our HyCO Business Unit (hydrogen, carbon monoxide [CO] and synthesis gas), the energy target is a 7% reduction in fuel and feedstock consumption per unit of HYCO product produced. For our large-scale air separation business, the energy target is a 7% reduction in electricity consumption per unit of atmospheric gas product produced.*

*Internal metrics are set as a unit of energy per unit of production. The reduction targets are set as 7% reductions against these energy metrics. External energy and GHG reduction targets are defined on an index basis to allow public disclosure of what would otherwise be confidential business information. The index values for the baseline year are set at 1.0. On this basis, the target index values are 0.93, representing a 7% reduction from the baseline year.*

*The final GHG reduction goals, as agreed by EPA Climate Leaders, will account for our two business unit intensity goals as well as incorporate GHG emission reduction opportunities available across the rest of the corporation.*

### **23.6 What are the sources or activities to which the target(s) apply?**

**Air Products Response:** *The primary energy reduction goals are for our two highest energy consuming business units – the HyCO business unit, which produces hydrogen, CO and synthesis gas, or hydrogen/carbon monoxide blends, and the Air Separation business unit, which produces oxygen, nitrogen and argon. Combined, these*

*businesses represent 70+% of our total company fossil fuel/feedstock consumption (HyCO) and electricity consumption (large ASUs). In addition, energy reduction opportunities from the remainder of the corporation (approximately 30% of the total corporate fossil fuel and electricity consumption) will be identified and tracked to account for energy and emission reduction achievements. In this way, every part of Air Products business can contribute to the overall energy saving objectives.*

### **23.7 Over what period/timescale does the target(s) extend?**

**Air Products Response:** *The goal period is from a calendar year 2007 baseline through calendar year 2015.*

### **GHG Emissions and Energy Reduction Activities**

### **23.8 What activities are you undertaking or planning to undertake to reduce your emissions/energy use?**

**Air Products Response:** *Our primary focus is on energy efficiency because our business portfolio is heavily weighted to energy intensive processes/products. It is critical to our success to continuously achieve efficiency improvements and we manage these efforts on a global basis. We are pursuing energy reductions both from existing operations and in the design of new facilities. Small enhancements in operating procedures, equipment fine tuning, and reliability can, when replicated across the entire asset base, result in significant energy savings.*

*We also continue to pursue improvements through R&D. For example, we are working on new air separation technology (ion transport membrane) with the potential to deliver significant efficiency improvements and revolutionize oxygen production (see recent press release regarding [Air Products and EPRI cooperative development agreement](#)). Advancements in hydrogen purification, equipment and process control also continue to yield measurable benefits. In addition, many individual facilities, both production plants and office/laboratory complexes, are pursuing specific energy efficiency projects.*

### **Goal Evaluation**

### **23.9 What benchmarks or key performance indicators do you use to assess progress against the emissions/energy reduction goals you have set?**

**Air Products Response:** *We have defined intensity-based metrics for the two highest energy consuming business units in the company. For our HyCO business, the internal metric is BTU/ton of HyCO product (hydrogen, CO and synthesis gas). For our Large Air Separation business, the internal metric is KWh/ton of atmospheric gas product (oxygen, nitrogen and argon). For external disclosure of progress against achieving these goals, Air Products will employ index values, where the 2007 baseline year index is set at 1.0.*

### **Goal Achievement**

**23.10. What emissions reductions, energy savings and associated cost savings have been achieved to date as a result of the plan and/or the activities described above? Please state the methodology and data sources you have used for calculating these reductions and savings.**

**Air Products Response:** *We are currently measuring progress against our new goals and will report in subsequent years. Additional efficiency improvements in calendar 2008 include:*

- *Attaining the U.S. EPA Energy Star designation for one of our corporate headquarters buildings;*
- *Continued 1-2% per year efficiency improvements in our Merchant Gas hauling fleet; and*
- *Use of advanced process controls and data evaluation techniques to improve product yields and efficiencies in our Performance Materials manufacturing facilities.*

**23.11. What investment has been required to achieve the emissions reductions and energy savings targets or to carry out the activities listed in response to question 23.8 above and over what period was that investment made?**

**Air Products Response:** *Investments of capital and labor resources to achieve continuous efficiency improvements is business confidential.*

### **Goal Planning and Investment**

**23.12. What investment will be required to achieve the future targets set out in your reduction plan or to carry out the activities listed in response to question 23.8 above and over what period do you expect payback of that investment?**

**Air Products Response:** *For business competitive reasons, our current and future technology development budgets and investment plans on energy efficiency improvements and GHG reduction programs are company confidential.*

**23.13. Please estimate your company's future Scope 1 and Scope 2 emissions for the next five years for each of the main territories or regions in which you operate or provide a qualitative explanation for expected changes that could impact future GHG emissions.**

**Air Products Response:** *We prepare regional forecasts of Scope 1 and Scope 2 GHG emissions for a minimum of the 5-year strategic planning cycle. Since these forecasts are a direct reflection of our business development objectives, they are company confidential.*

*In general, we anticipate continued growth in key existing markets – refinery hydrogen and tonnage oxygen. As such, we would expect our Scope 1 and Scope 2 emissions to increase. Through successful efficiency improvement initiatives, consistent with our reduction goals discussed in Question 23.5, we expect our emissions intensity to be reduced over this same period.*

Hydrogen's challenge grows greater every day. As lower quality supplies of crude oil are required to meet the world's energy needs, the trend for crude oil to be heavier in its consistency and contain more sulfur will not be going away. At the same time, the world demands cleaner air, and with it comes the increased need for cleaner burning fuels, meaning hydrogen's role will remain critically important both today and in the years ahead. Learn more about how Air Products is meeting the demand: [www.airproducts.com/hydrogen](http://www.airproducts.com/hydrogen).

**23.14. Please estimate your company's future energy use for the next five years for each of the main territories or regions in which you operate or provide a qualitative explanation for expected changes that could impact future GHG emissions.**

**Air Products Response:** *We prepare regional forecasts of energy consumption consistent with the 5-year strategic planning cycle and 3-year operating plans for each of our businesses. Because these forecasts are a direct reflection of our business development objectives, they are company confidential.*

*In general, we anticipate continued growth in key existing markets – refinery hydrogen and tonnage oxygen. As such, we would expect to see a continued increase in our consumption of electricity and natural gas used as a feedstock and as a fuel.*

**23.15. Please explain the methodology used for your estimations and any assumptions made.**

**Air Products Response:** *Air Products uses business projections, including sales forecasts and expected project "wins," to estimate GHG emissions over a seven-year planning horizon. Projections of process efficiency improvements allow translation of sales forecasts into energy consumption, and hence, GHG emissions. This information is company confidential.*

## **24. Planning:**

**24.1 How do you factor the cost of future emissions into capital expenditures and what impact have those estimated costs had on your investment decisions?**

**Air Products Response:** *We have added a mandatory GHG Emission Risk Assessment to the Environmental, Health and Safety (EHS) Risk Assessment required for all Expenditure Authorization Requests, covering new capital investments and any commercial agreements that incur a potential responsibility for GHG emissions. The GHG Emission Risk Assessment considers the quantity of GHG emissions potentially generated, the likelihood that regulations will impose a financial risk during the life of the asset, the degree to which the financial exposure is mitigated through contractual terms, and the predicted cost of a hypothetical CO<sub>2</sub> allowance. We assess the resultant risk against a semi-quantitative Risk Matrix (probability and financial impact) with other commercial, technical, and EHS risks. The Risk Ranking results in a*

*more comprehensive discussion on the risk and mitigation options prior to approval of the expenditure authorization.*

*The impact of this enhanced risk assessment process insures consideration and discussion of the evolving, potential financial obligations associated with GHG emissions. Air Products considers the impact of this risk assessment process on investment decision as business confidential, and does not report on those impacts publically.*

## **Governance**

### **25. Responsibility:**

**25.1. Does a Board Committee or other executive body have overall responsibility for climate change?**

**Air Products Response:** Yes

**25.3. Which Board Committee or executive body has overall responsibility for climate change?**

**Air Products Response:** *The Environmental, Safety and Public Policy committee of our Board of Directors provides formal oversight for environmental performance and goals, including those related to climate change. Our Vice President of Environmental, Health, Safety and Quality has direct operating responsibility for our climate change policy and GHG inventory programs.*

**25.4. What is the mechanism by which the Board or other executive body reviews the company's progress and status regarding climate change?**

**Air Products Response:** *Air Products' Corporate Executive Committee, the most senior members of our management team, regularly conducts a comprehensive review of climate change risks and opportunities brought forward by our global GHG Strategy Team, which acts as a focal point for these issues. In addition, our Sustainability Council defines policies, programs and performance indicators for sustainability initiatives, including those related to climate change.*

### **26. Individual Performance:**

**26.1. Do you provide incentives for individual management of climate change issues including attainment of GHG targets? If so:**

**Air Products Response:** *Air Products uses existing compensation programs to ensure employee and manager alignment around all strategic objectives.*

- *For operating and technology personnel, GHG emission reductions are driven by process energy efficiency and product yield improvements. These metrics are used as performance goals in technology development and operating units.*

*Employees responsible for managing and improving these areas of performance are rewarded under existing compensation programs for attaining performance goals.*

- *For commercial and technology personnel, success includes developing new commercial offerings that yield cost-effective solutions to our customers' GHG emission reduction needs, and bringing such solutions to the marketplace. Employees responsible for developing these offerings are rewarded under existing compensation programs for meeting these commercial objectives.*
- *For environmental management personnel, success includes implementing effective work processes to compile the GHG inventory and satisfy regulatory compliance and reporting requirements. Employees responsible for implementing and administering these compliance systems are rewarded under existing compensation programs for attaining performance goals.*

## **26.2. Are those incentives linked to monetary rewards?**

**Air Products Response:** *Employees responsible for their respective climate change related objectives are rewarded under existing compensation programs for attaining performance goals.*

## **26.3. Who is entitled to benefit from those incentives?**

**Air Products Response:** *Any employee may have a performance objective related to climate change business objectives and would therefore benefit from achieving their performance objectives.*

## **27. Communications:**

**27.1. Do you publish information about the risks and opportunities presented to your company by climate change, details of your emissions and plans to reduce emissions? If so, please indicate which of the following apply and provide details and/or a link to the documents or a copy of the relevant excerpt:**

**27.2. The company's Annual Report or other mainstream filings.**

**Air Products Response:** *Air Products Annual Report provides a general discussion of climate change concerns in the Chairman's Letter to Shareholders [Link: [2008 Annual Report](#)]. More specifically, Air Products included a discussion of the potential risks and opportunities presented by climate change and anticipated climate change regulation in the most recent SEC 10-K filing [Link: [2009 Annual 10-K Filing – Pages 22-23](#)].*

*The relevant section states:*

*“Some of the Company's operations are within jurisdictions that have, or are developing, regulations governing emissions of greenhouse gases (GHGs). These include existing and expanding coverage under the European Union Emissions Trading Scheme; mandatory reporting and*

reductions at manufacturing facilities in Alberta, Canada; and mandatory reporting and anticipated constraints on GHG emissions in California and Ontario. In the U.S., regional initiatives have been implemented that will regulate GHG emissions from fossil fuel-driven power plants, and some federal legislative proposals also focus on such power plants. As a large consumer of electric power, the Company could be impacted by increased costs that may arise from such regulatory controls. In addition, federal legislation has been introduced in the U.S. that would regulate production of fluorinated gases manufactured by the Company. Increased public awareness and concern may result in more international, U.S. federal, and/or regional requirements to reduce or mitigate the effects of GHGs.

The Company may also incur costs related to GHG emissions from its hydrogen facilities and other operations such as fluorinated gases production. The Company believes it will be able to mitigate some of the potential costs through its contractual terms, but the lack of definitive legislation or regulatory requirements prevents accurate prediction of the long-term impact on the Company. Any legislation that limits or taxes GHG emissions from Company facilities could impact the Company's growth by increasing its operating costs or reducing demand for certain of its products.

Regulation of GHGs may also produce new opportunities for the Company. The Company continues to develop technologies to help its facilities and its customers to lower energy consumption, improve efficiency, and lower emissions. The Company is also developing a portfolio of technologies that capture CO<sub>2</sub> from power and chemical plants before it reaches the atmosphere, enable cleaner transportation fuels, and facilitate alternate fuel source development. In addition, the potential demand for clean coal and the Company's carbon capture solutions could increase demand for oxygen, one of the Company's main products, and the Company's proprietary technology for delivering low-cost oxygen."

### **27.3. Voluntary communications (other than to CDP) such as Corporate Social Responsibility reporting.**

**Air Products Response:** *We communicate risks and opportunities from GHG emissions in three primary forums. The primary communication channel with our shareholders and employees, as well as the general public, is our Corporate Responsibility Annual Report (Link: [2009 Corporate Responsibility Annual Report](#)). A second channel is through our corporate responsibility web site, specifically the "Greenhouse Gases and Energy Efficiency" web pages (Link: [Greenhouse Gases and Energy Efficiency](#)). A third venue of communication is our annual response to this Carbon Disclosure Project questionnaire.*

## 28. Public Policy:

### 28.1. Do you engage with policymakers on possible responses to climate change including taxation, regulation and carbon trading? If so, please provide details.

**Air Products Response:** *Air Products provides input regarding potential climate change policy and regulation through open public comment processes toward practical, technically sound, and cost effective legislation and regulation. We have engaged policymakers through trade associations, non-governmental organizations and as Air Products. We continue to actively participate in the dialogue on several key energy and climate change programs, including the third phase of the EU ETS, California's AB32 rule-making, the U.S. EPA's proposal of a national mandatory GHG emission reporting regulation and climate change legislative proposals being considered by the U.S. Congress.*

## Forward Looking Statements

The information above contains "forward-looking statements" within the safe harbor provisions of the Private Securities Litigation Reform Act of 1995. These forward-looking statements are based on management's reasonable expectations and assumptions as of the date of this document regarding important risk factors. Actual performance and financial results may differ materially from projections and estimates expressed in the forward-looking statements because of many factors, including, without limitation, continuing deterioration in economic and business conditions; weakening demand for the Company's products, future financial and operating performance of major customers and industries served by the Company; unanticipated contract terminations or customer cancellations or postponement of projects and sales; asset impairments due to economic conditions or specific product or customer events; the impact of competitive products and pricing; interruption in ordinary sources of supply of raw materials; the ability to recover unanticipated increased energy and raw material costs from customers; costs and outcomes of litigation or regulatory activities; consequences of acts of war or terrorism impacting the United States' and other markets; the effects of a pandemic or epidemic or a natural disaster; charges related to current portfolio management and cost reduction actions; the success of implementing cost reduction programs and achieving anticipated acquisition synergies; the timing, impact, and other uncertainties of future acquisitions or divestitures; the ability to attract, hire and retain qualified personnel in all regions of the world where the Company operates; successful development and market acceptance of new products and applications; significant fluctuations in interest rates and foreign currencies from that currently anticipated; the continued availability of capital funding sources in all of the Company's foreign operations; the impact of new or changed environmental, healthcare, tax or other legislation and regulations in jurisdictions in which the Company and its affiliates operate; the impact of new or changed financial accounting standards; and the timing and rate at which tax credits can be utilized and other risk factors described in the Company's Form 10K for its fiscal year ended September 30, 2008 and Form 10-Q for the quarter ended December 31, 2008. The Company disclaims any obligation or undertaking to disseminate any updates or revisions to any forward-looking statements contained in this document to reflect any change in the Company's assumptions, beliefs or expectations or any change in events, conditions or circumstances upon which any such forward-looking statements are based.

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