

Module: Introduction**Page: Introduction****CC0.1 Introduction**

Please give a general description and introduction to your organization.

Praxair, Inc. (Praxair or the company) was founded in 1907 and became an independent publicly traded company in 1992. Praxair was the first company in the United States to produce oxygen from air using a cryogenic process and continues to be a major technological innovator in the industrial gases industry.

Praxair is a leading industrial gas supplier in North and South America, is growing in Asia, and has strong, well-established businesses in Europe. Praxair's primary products in its industrial gases business are atmospheric gases (oxygen, nitrogen, argon, rare gases) and process gases (carbon dioxide, helium, hydrogen, electronic gases, specialty gases, acetylene). The company also designs, engineers, and builds equipment that produces industrial gases primarily for internal use. The company's surface technologies segment, operated through Praxair Surface Technologies, Inc., supplies wear-resistant and high-temperature corrosion-resistant metallic and ceramic coatings and powders. Praxair's sales were \$10,776 million, \$12,273 million, and \$11,925 million for 2015, 2014, and 2013, respectively. In 2015, sales were negatively impacted by foreign currency translation versus 2014. Refer to Item 7, Management's Discussion and Analysis in the 2015 Annual Report, for a discussion of consolidated sales and Note 18 to the consolidated financial statements for additional information related to Praxair's reportable segments.

Praxair serves a diverse group of industries including healthcare, petroleum refining, manufacturing, beverage carbonation, fiber-optics, steel making, aerospace, chemicals and water treatment. In 2015, 94% of sales were generated in four geographic segments (North America, Europe, South America and Asia) primarily from the sale of industrial gases, with the balance generated from the surface technologies segment. Praxair provides a competitive advantage to its customers by continuously developing new products and applications, which allow them to improve their productivity, energy efficiency and environmental performance.

CC0.2 Reporting Year

Please state the start and end date of the year for which you are reporting data.

The current reporting year is the latest/most recent 12-month period for which data is reported. Enter the dates of this year first.

We request data for more than one reporting period for some emission accounting questions. Please provide data for the three years prior to the current reporting year if you have not provided this information before, or if this is the first time you have answered a CDP information request. (This does not apply if you have been offered and selected the option of answering the shorter questionnaire). If you are going to provide additional years of data, please give the dates of those reporting periods here. Work backwards from the most recent reporting year.

Please enter dates in following format: day(DD)/month(MM)/year(YYYY) (i.e. 31/01/2001).

Enter Periods that will be disclosed

Thu 01 Jan 2015 - Thu 31 Dec 2015

CC0.3 Country list configuration

Please select the countries for which you will be supplying data. If you are responding to the Electric Utilities module, this selection will be carried forward to assist you in completing your response.

Select country

CC0.4 Currency selection

Please select the currency in which you would like to submit your response. All financial information contained in the response should be in this currency.

USD(\$)

CC0.6 Modules

As part of the request for information on behalf of investors, electric utilities, companies with electric utility activities or assets, companies in the automobile or auto component manufacture sub-industries, companies in the oil and gas sub-industries, companies in the information technology and telecommunications sectors and companies in the food, beverage and tobacco industry group should complete supplementary questions in addition to the main questionnaire.

If you are in these sector groupings (according to the Global Industry Classification Standard (GICS)), the corresponding sector modules will not appear below but will automatically appear in the navigation bar when you save this page. If you want to query your classification, please email respond@cdp.net.

If you have not been presented with a sector module that you consider would be appropriate for your company to answer, please select the module below. If you wish to view the questions first, please see <https://www.cdp.net/en-US/Programmes/Pages/More-questionnaires.aspx>.

Further Information

Module: Management

Page: CC1. Governance

CC1.1 Where is the highest level of direct responsibility for climate change within your organization?

Board or individual/sub-set of the Board or other committee appointed by the Board

CC1.1a Please identify the position of the individual or name of the committee with this responsibility

The name of the Board Committee is the Technology, Safety and Sustainability (TSS) Committee; this committee "assists the Board in its oversight of: (a) technology and research & development, including the use of technology in products applications; (b) safety, particularly the use of technology in enhancing safety performance; (c) sustainability and environmental matters; and (d) certain enterprise risks. In furtherance of these duties, the Technology, Safety & Sustainability Committee, among other duties,

- (1) reviews and evaluates Praxair's use of technology and its technology capabilities and Praxair's strategies, objectives and effectiveness of research and development efforts;
- (2) monitors and reviews Praxair's personnel, process and distribution safety goals and performance and the use of technology to enhance safety performance;
- (3) reviews Praxair's policies, programs and practices related to sustainability and the environment; and
- (4) provides oversight and guidance on certain enterprise risks that are not otherwise reviewed by the full Board of Directors or its other committees including (a) natural disasters, and (b) plant control systems security."

Specifically on Sustainability and Environmental Matters, the Committee "review[s] the Corporation's policies, programs and practices related to sustainability and the environment; and asses[es] current and emerging risks and issues related to sustainability and the environment." (TSS Committee Charter)

This includes risks and activity related to climate change, as well as emerging issues in the sustainability area. The Committee reports to the full Board of Directors on all of these issues. The Chairperson of the Committee is Nance K. Dicciani.

CC1.2 Do you provide incentives for the management of climate change issues, including the attainment of targets?

Yes

CC1.2a Please provide further details on the incentives provided for the management of climate change issues

Who is entitled to benefit from these incentives?	The type of incentives	Incentivized performance indicator	Comment
Chief Executive Officer (CEO)	Monetary reward	Emissions reduction project Emissions reduction target Energy reduction project Energy reduction target Efficiency project Efficiency target Other: Increasing eco portfolio to 30% of revenue by 2015	<p>The Board believes culture must be driven from the top by example. As such, the Compensation Committee confirmed the importance of setting non-financial objectives to reinforce leadership's focus on maintaining an enduring culture that supports both short- and long-term sustainable results. The Compensation Committee identified the non-financial elements that were considered most important to long-term sustainable success and established annual non-financial goals with respect to those elements. Non-financial goals included continuously reducing the environmental impact of operations, meeting sustainable development performance targets, and helping our customers enhance their environmental performance.</p> <p>The Compensation Committee determined that the Company's performance with respect to the non-financial goals was favorable and awarded a positive 7% adjustment for the Named Executive Officers (limited by the retroactive design changes). The Compensation Committee noted the following as examples of actions that successfully supported the Company's strategic objectives in determining 2015 variable compensation payouts:</p> <ul style="list-style-type: none"> -- Obtaining productivity results that were 2 times greater than next competitor, and increased productivity projects 7% year-over-year, -- earning a place on the Dow Jones Sustainability World Index for the 13th consecutive year and on the CDP Disclosure Leadership Index for the 8th consecutive year. (see March 2016 Proxy Statement, page 44-46)
Corporate executive team	Monetary reward	Emissions reduction project Emissions reduction target Energy reduction project Energy reduction target Efficiency project Efficiency target Other: Increasing eco portfolio to 30% of revenue by 2015	<p>The Board believes culture must be driven from the top by example. As such, the Compensation Committee confirmed the importance of setting non-financial objectives to reinforce leadership's focus on maintaining an enduring culture that supports both short- and long-term sustainable results. The Compensation Committee identified the non-financial elements that were considered most important to long-term sustainable success and established annual non-financial goals with respect to those elements. Non-financial goals included continuously reducing the environmental impact of operations, meeting sustainable development performance targets, and helping our customers enhance their environmental performance.</p> <p>The Compensation Committee determined that the Company's performance with respect to the non-financial goals was favorable and awarded a positive 7% adjustment. The Compensation Committee noted the following as examples of actions that successfully supported the Company's strategic objectives in determining 2015 variable compensation payouts:</p> <ul style="list-style-type: none"> -- Obtaining productivity results that were 2 times greater than next competitor, and increased productivity projects 7% year-over-year, -- earning a place on the Dow Jones Sustainability World Index for the 13th consecutive year and on the CDP Disclosure Leadership Index for the 8th consecutive year. (see March 2016 Proxy Statement, page 44-46)

Who is entitled to benefit from these incentives?	The type of incentives	Incentivized performance indicator	Comment
Management group	Monetary reward	Emissions reduction target Energy reduction target Efficiency target Other: Increasing eco portfolio to 30% of revenue by 2015	
All employees	Monetary reward	Emissions reduction target Energy reduction target Efficiency target Other: Increasing eco portfolio to 30% of revenue by 2015	

Further Information

Information on Technology, Safety & Sustainability Committee of the Board: <http://www.praxair.com/our-company/our-people/our-board-of-directors/technology-and-safety-and-sustainability-committee>

Page: CC2. Strategy

CC2.1 Please select the option that best describes your risk management procedures with regard to climate change risks and opportunities

Integrated into multi-disciplinary company wide risk management processes

CC2.1a Please provide further details on your risk management procedures with regard to climate change risks and opportunities

Frequency of monitoring	To whom are results reported?	Geographical areas considered	How far into the future are risks considered?	Comment
Annually	Board or individual/sub-set of the Board or committee appointed by the Board	North America, South America, Europe, Asia	> 6 years	<p>At least annually, the full Board discusses the key enterprise risks identified by management, management accountability for managing or mitigating each risk, the steps being taken to manage each risk, and which Board Committees will oversee each risk area on an ongoing basis.</p> <p>Each Committee's calendar of recurring meeting agenda topics addresses risk areas pertinent to the Committee's subject-matter responsibilities. These areas include a regular review of the Company's sustainability program and current and emerging risks and issues related to sustainability and the environment (Technology, Safety & Sustainability Committee). Other risk areas are regularly reviewed by the full Board, including safety and environmental risk (covered at each Board meeting).</p> <p>In addition, risk assessments and energy cost forecasts are performed for capital investments in productive capacity; results are reported to the Board annually.</p>

CC2.1b Please describe how your risk and opportunity identification processes are applied at both company and asset level

COMPANY LEVEL RISK/OPPORTUNITY ASSESSMENT: Responses are collected in an annual survey to business management and functional leads worldwide, including sustainable development. Respondents identify risks in their area against an incidence/ severity index. The results are subjected to a range of analyses to establish priority concerns. Risks and opportunities are evaluated based on their potential financial implications up to the highest consequence, i.e., loss of life, as well as the probability of occurrence.

Risks are reviewed by the full Board of Directors annually. As part of that review, the Board decides which Board Committees will oversee each risk area on an ongoing basis. Each Committee then addresses its risk areas during its recurring meetings.

ASSET LEVEL RISK/OPPORTUNITY ASSESSMENT: Risks take into account information from the field. In addition, risks to physical assets are monitored with periodic and at least annual evaluations from external risk assessors. These risk assessments evaluate each facility worldwide over a certain size, its vulnerability to risks from severe weather, and the potential monetary risk. The data is analyzed to help determine the scope and limit of Praxair's catastrophic insurance coverage. Risk maps are also developed to identify areas prone to severe weather events, where Praxair also has assets. Finally, Praxair performs long-term assessments of energy supply reliability, costs and volatility, which are material to capital investment projects.

CC2.1c How do you prioritize the risks and opportunities identified?

Praxair evaluates internal and external stakeholder views at the corporate level. Praxair's business strategy reflects continuous engagement with our customers, employees, shareholders, suppliers and the communities in which we operate.

During Praxair's risk assessment process, Praxair business management and functional leads respond to an annual risk survey to identify risks in their area against an incidence/severity index. The results are subjected to a range of analyses and combined with the results of external stakeholder engagement to establish priority concerns. Those risks considered most significant are identified and reported at least annually to executive management and to the Board, and then to shareholders in Praxair's Annual Report, see ITEM 1A RISK.

The 2015 Annual Report list of risks in Praxair's 10k identified climate change risk in the areas of (1) rising energy prices; (2) emerging environmental and GHG regulation; and (3) risks of catastrophic events such as extreme weather.

Because climate change risks were identified by the corporate risk assessment process, they are automatically considered top priorities in the annual sustainable development materiality assessment (SDMA). As part of the SDMA process, Praxair reviews all the issues potentially applicable to the company, and ranks the materiality of these issues. During this process, Praxair consolidates findings from key sustainability research organizations, as well as information gathered from other stakeholders.

For the most recent SDMA, a group of Praxair managers from each of our major countries and corporate functions were asked to rank the top dozen elements for 2014-2015. Six sustainable development priority factors were ultimately identified, which are mapped to Praxair's core values, strategy and growth drivers. "Energy and Climate Change" is one of these six priority factors.

CC2.2 Is climate change integrated into your business strategy?

Yes

CC2.2a Please describe the process of how climate change is integrated into your business strategy and any outcomes of this process

i. Influence: Energy & climate change-related initiatives, goals and targets are integrated into Praxair's overall business strategy. The overall business strategy is influenced by the energy & climate change risks and opportunities identified during Praxair's annual risk assessment process, as well as performance against energy & climate change goals and targets. Our corporate GHG targets are the main components of our business strategy influenced by climate change concerns.

Praxair has a Sustainable Development (SD) Management System in place to drive the internal process for collecting SD performance data, which includes energy and GHG data. Performance data is reviewed monthly by the businesses and senior management and quarterly by the executive leadership team, which defines and executes our overall SD strategy. Energy & GHG emissions, risks and opportunities are considered in the development of Praxair's SD targets.

The vice president of sustainable development also reports SD performance information at least twice per year to the CEO and the Executive Leadership SD Steering Committee, and annually to the Board of Directors Committee on Technology, Safety and Sustainability.

ii. Example: Energy is a large cost item for Praxair; this influenced our corporate strategy and led us to set an ASU design efficiency target. When we met our original target of 6% improvement in 2013, we set a new target of 8.5% improvement, 2010-2015. At the end of 2015 we had achieved 8.5%, meaning that ASUs built in 2015 were designed to operate 8.5% more efficiently than those built in 2010.

iii. Aspects: Praxair's sustainable development strategy has been influenced by final and proposed regulations in the U.S. and around the world, which require GHG reporting and/or cap and trade; the identified regulatory, physical and reputational risks; as well as the opportunities to Praxair's business driven by climate change.

iv. Short-Term Strategy: Climate change concerns have influenced Praxair's short-term (1 to 6 years) business strategy, most importantly by serving as the driver for the development of corporate GHG targets. The achievement of these targets is part of the management variable compensation goals.

Our focus on achieving these targets aligns directly with cost savings initiatives. Praxair has developed environmental KPIs to understand environmental and GHG costs in operations. Our productivity organization saves over 5% off our gross cost stack each year. In 2010 we started to report the environmental savings from productivity projects. In 2015 this grew to more than \$105 million gross savings from GHG and energy projects, totaling 393,000 MT CO₂e saved. Tracking environmental productivity allows us to see the relationship between different activities, such as reducing energy and reducing water and/or waste.

v. Long-Term Strategy: Defined as more than 6 years in the future; we see long-term business opportunity from innovation that takes advantage of opportunities presented by climate change mitigation. With Praxair's business model, much of the environmental benefit we provide customers is energy efficiency. Praxair has created measurement systems in operations and in R&D that allow us to explore the GHG costs and benefits of any operational improvement or innovation project. We have a target that at least 30% revenue should come from our eco portfolio by 2015, i.e., from products that bring environmental benefit (22% in 2009; 33% in 2015). We recently set a new eco portfolio target through 2020.

Climate change concerns have also influenced our long-term risk mitigation practices. To mitigate against the potential increase in the price of energy, and as part of operational eco-efficiency, Praxair continues to invest aggressively in energy efficiency. We have a long-term target: From 2009–2020, achieve cumulative savings in excess of \$500 million, 8 million MWH and 5 million MT CO₂e. Through 2015, cumulative savings are more than \$260 million, 1.4 million MWH and 2.1 million MT CO₂e avoided, on track for meeting this goal. We also perform energy cost forecasts and risk assessments for capital projects to manage risks associated with the long-term reliability of energy supplies.

vi. Strategic Advantage: The focus on energy efficiency and GHG emissions reductions reduces Praxair's risk from higher energy costs, and is a significant contributor to our operational and financial results and Praxair's industry-leading operating margin and return on capital.

COMPETITIVE ADVANTAGE: GHG goals are a clear sign of leadership in our sector – evidenced by recognition received from CDP and others. Energy efficiency directly drives business results by providing Praxair's customers with a lower cost solution to industrial gas production, typically than they can generate/supply on their own, which allows us to win more customers, among other benefits.

Praxair invested in the calculation of the carbon productivity of our major products and applications (e.g., hydrogen for refining and oxygen in the steel industry), and the validation and communication of this information to our customers and other stakeholders. We invested in research on climate change mitigation technologies that include industrial energy efficiency, 2nd generation biofuels and applications for solar cells. This information is very valuable to our customers and other stakeholders and differentiates us in our sector.

Employee environmental engagement is a key part of our employee engagement strategy. Employees at all levels work to help Praxair achieve the company-wide GHG targets. Praxair is using environmental data and analytics to connect with employee values and the company mission, and to drive results in productivity and eco-efficiency, improve decision making and gain competitive advantage. Employee environmental engagement is helping save money, energy and GHG emissions, reduce other resource consumption, improve safety and operational discipline, and is driving environmental innovation.

vii. Business Decisions: By producing hydrogen at our Niagara Falls facility, Praxair is able to source by-product hydrogen from local sources and take advantage of electricity produced from 100% renewable resources. During 2014, Praxair was awarded a long-term contract to supply hydrogen to a fuel cell solutions provider and was able to meet their needs with our "green" hydrogen. As demand increased, Praxair invested in on-purpose hydrogen production in 2015 to increase the supply of hydrogen to our customers by 50%. The carbon footprint from this liquid hydrogen production continues to benefit from the access to renewable electricity. The capital investment to build the on-purpose hydrogen was a significant business decision influenced by regulatory risks and the emerging market for hydrogen for fuel cell applications.

CC2.2c Does your company use an internal price of carbon?

No, and we currently don't anticipate doing so in the next 2 years

CC2.3 Do you engage in activities that could either directly or indirectly influence public policy on climate change through any of the following? (tick all that apply)

Direct engagement with policy makers
Trade associations

CC2.3a On what issues have you been engaging directly with policy makers?

Focus of legislation	Corporate Position	Details of engagement	Proposed legislative solution
Regulation of methane emissions	Support	Praxair actively engaged in educating the U.S. Congress and state and local officials on the benefits of strong leak detection programs for lines that store, transport, distribute or deliver natural gas.	Praxair provided comment to legislative staff and in response to agency proposed rules regarding the benefits of leak detection technologies in addressing safety and emissions.
Clean energy generation	Support	Praxair is a leading proponent of the Promoting Water Stewardship and Efficient Oil and Gas Production bill, HB 2691, considered in the recent session of the Texas State Legislature. This bill, which passed the State House but was not considered by the State Senate, provided tax incentives for the use of alternative base fluids, like carbon dioxide and nitrogen, in fracturing wells. The use of such fluids reduces the use of water and promotes a more sustainable way of extracting natural gas. Praxair's DryFrac™ Waterless Fracturing Technology can replace water use in fracturing wells and can increase yields of natural gas. Much of the CO2 used in Praxair's liquid CO2 technology is captured from industrial off-gas and purified.	Praxair supports this legislation with no exceptions. If enacted, this incentive would be unprecedented in its drive of carbon utilization and water stewardship.
Energy efficiency	Support	Praxair advocated for continued research and development funding by the Federal and state government of solid state reforming technology which can make utilization of fossil fuels like coal and natural gas more efficient while reducing GHG footprints.	Continued federal and state funding for fossil fuel energy efficiency technology development.

CC2.3b Are you on the Board of any trade associations or provide funding beyond membership?

No

CC2.3f 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?

Praxair maintains a detailed oversight process to ensure our activities are conducted in a legal, ethical and transparent manner. This includes oversight by the chief compliance officer and an annual program review by the Board of Directors. Praxair's Government Relations department provides regular reporting on such activities to the Chief Compliance Officer and reports to the General Counsel.

In addition, all of our employees participate in annual training regarding issues related to doing business with the government, complying with anti-trust and competition laws, and the FCPA.

Finally, there is coordination with the VP & Chief Sustainability Officer and General Counsel to ensure consistency of public policy advocacy with Praxair's sustainability strategy, including our energy and GHG strategy. The VP & Chief Sustainability Officer works closely with government relations and participates in cross-functional groups to review advocacy positions that have an environmental or climate change impact. In turn, government relations has a seat on the Sustainable Development Council, which meets quarterly.

Further Information

For a discussion of the Board's role in risk oversight, see Praxair's March 2016 Proxy Statement, page 9. Praxair holds Board memberships in its regional and international industrial gas associations (such as CGA and AIGA). In 2015, these organizations did not advocate positions on climate change and none of them had a Working Group addressing this issue.

Praxair's Chairman and CEO Steve Angel led a U.S.-China Business Council (USCBC) Board of Directors delegation to Beijing, China, on May 4-5, 2015. The U.S. delegation met with China's Vice Premier Wang Yang, Commerce Minister Gao Hucheng and Finance Vice Minister Zhu Guangyao to discuss China's economic slowdown, U.S./China negotiations concerning a bilateral investment treaty, cyber security, plant safety, economic development incentive program reforms, competition policy enforcement and other critical matters. Steve's trip to China came on the heels of Praxair's participation in a U.S. Trade Mission to China in April 2015, led by U.S. Commerce Secretary Penny Pritzker and Deputy U.S. Energy Secretary Elizabeth Sherwood-Randall. Praxair was among 24 companies selected by the U.S. government to promote U.S. products and technologies that will help China reach its carbon emissions reduction goals.

Page: CC3. Targets and Initiatives

CC3.1 Did you have an emissions reduction or renewable energy consumption or production target that was active (ongoing or reached completion) in the reporting year?

Absolute target
Intensity target

CC3.1a Please provide details of your absolute target

ID	Scope	% of emissions in scope	% reduction from base year	Base year	Base year emissions covered by target (metric tonnes CO2e)	Target year	Is this a science-based target?	Comment
Abs1	Scope 3: Processing of sold products	11%	100%	2015	41028000	2015	No, and we do not anticipate setting one in the next 2 years	By producing hydrogen at our Niagara Falls facility, Praxair is able to source by-product hydrogen from local sources and take advantage of electricity produced from 100% renewable resources. During 2014, Praxair was awarded a long-term contract to supply hydrogen to a fuel cell solutions provider and was able to meet their needs with our "green" hydrogen. As demand increased, Praxair invested in on-purpose hydrogen production in 2015 to increase the supply of hydrogen to our customers by 50%. The carbon footprint from this liquid hydrogen production continues to benefit from the access to renewable electricity. The capital investment to build the on-purpose hydrogen was a significant business decision influenced by regulatory risks and the emerging market for hydrogen for fuel cell applications.
Abs2	Scope 1	1%	3%	2012	81000	2015	No, and we do not anticipate setting one in the next 2 years	In 2012, Praxair set a target to reduce fuel consumption and GHG emissions by 3% from bulk trucking in the U.S., by installing on-board computers (OBCs). This target shows how the use of technology in our trucks is improving fuel efficiency and corresponding GHG emissions.

CC3.1b Please provide details of your intensity target

ID	Scope	% of emissions in scope	% reduction from base year	Metric	Base year	Normalized base year emissions covered by target	Target year	Is this a science-based target?	Comment
Int1	Scope 1	42%	2.4%	Metric tonnes CO2e per metric tonne of product	2009	8.27	2015	No, and we do not anticipate setting one in the next 2 years	Praxair has a target to improve GHG intensity from Hydrogen Production by 2.4% by 2015, from a 2009 baseline. This equates to 0.4% improvement each year. Hydrogen is Praxair's principal source of Scope 1 emissions and one of our most significant growth drivers. The hydrogen target was set in 2009 for hydrogen facilities operating at the time. The target does not include new hydrogen plants that started operating after 2009. In 2009, the plants included in the target accounted for about 75% of Scope 1 emissions from hydrogen. In 2015, the target covered 42% of Scope 1 emissions.

ID	Scope	% of emissions in scope	% reduction from base year	Metric	Base year	Normalized base year emissions covered by target	Target year	Is this a science-based target?	Comment
Int2	Scope 1	1%	9%	Metric tonnes CO2e per metric tonne of product	2009	0.021	2015	No, and we do not anticipate setting one in the next 2 years	Praxair established a trucking target in 2009 to improve GHG intensity from our worldwide bulk trucking operation (Praxair drivers) by 9% through 2015, from a 2009 baseline. This equates to 1.5% per year.
Int3	Scope 2 (location-based)	84%	6%	Metric tonnes CO2e per metric tonne of product	2009	0.19	2015	No, and we do not anticipate setting one in the next 2 years	Praxair has a target to improve energy intensity from Air Separation Units (ASUs) by 6% by 2015, from a 2009 baseline. This equates to 1% per year. ASUs are our largest users of electricity, and therefore our largest source of Scope 2 emissions. We have translated this target into a GHG target by using a constant average global emission factor. We recognize that emission factors vary greatly across regions and change over time, but because energy intensity is our business metric, we followed CDP's guidance in the use of this methodology for the purposes of calculating performance against this target.
Int4	Scope 3: Downstream Transportation & Distribution	3%	1.5%	Metric tonnes CO2e per metric tonne of product	2014	0.020	2015	No, and we do not anticipate setting one in the next 2 years	Praxair has a target in South America to improve GHG intensity from contract driving 1.5% per year. This target is in line with our worldwide bulk trucking intensity target, which applies to Praxair drivers (Scope 1). In South America in 2015, contractors drove 97% of the total miles driven to deliver Praxair product.

CC3.1c Please also indicate what change in absolute emissions this intensity target reflects

ID	Direction of change anticipated in absolute Scope 1+2 emissions at target completion?	% change anticipated in absolute Scope 1+2 emissions	Direction of change anticipated in absolute Scope 3 emissions at target completion?	% change anticipated in absolute Scope 3 emissions	Comment
Int1	Increase	14			The increase in absolute emissions from the hydrogen plants is due to increases in production at these sites. In 2009, which was a recession year, these plants were not operating at full capacity; in recent years they are operating at or near full capacity.

ID	Direction of change anticipated in absolute Scope 1+2 emissions at target completion?	% change anticipated in absolute Scope 1+2 emissions	Direction of change anticipated in absolute Scope 3 emissions at target completion?	% change anticipated in absolute Scope 3 emissions	Comment
Int2	Increase	19			The increase in absolute emissions is due to an increase in the overall number of miles driven since 2009, which is a function of increased production and sales. In 2009, which was a recession year, Praxair plants were not operating at full capacity, meaning there was less product to deliver. In recent years production has increased, as have product deliveries/miles driven.
Int3	Increase	39			The increase in absolute emissions is due to increases in production at ASUs worldwide and the construction of new ASU plants since 2009. In 2009, which was a recession year, these plants were not operating at full capacity; in recent years they are operating at or near full capacity. Absolute emissions are calculated here using local and regional emission factors, as opposed to the constant EF used in the conversion of the energy target to a GHG target noted in 3.1b. This is so that information here is consistent with our reporting in sections 9 and 12 of this response.
Int4			Decrease	7	Worldwide, Praxair production decreased 1% in 2015, compared to 2014. With a production decrease, the total number of miles driven is expected to drop, along with corresponding GHG emissions. This was the case in South America, where Praxair delivered less product and drove fewer miles in 2015 than in 2014. Absolute emissions from driving in South America decreased 7%, 2015 to 2014. Note, total Scope 3 emissions from driving increased from 2014 to 2015. This is largely due to an increase in the number of miles driven in Asia where new plants started up in 2015.

CC3.1e For all of your targets, please provide details on the progress made in the reporting year

ID	% complete (time)	% complete (emissions or renewable energy)	Comment
Abs1	100%	100%	Praxair exceeded the target to enable twice the amount of our own Scope 1+2 emissions to be avoided by customers or their end users. In 2015, we calculated GHG emissions avoided from Hydrogen sold to make ultra-low sulfur fuel (used in vehicles with diesel particulate filters), Krypton sold to insulate windows, Oxygen sold to optimize combustion in steelmaking, and Argon for welding. These avoided emissions totaled 51.5 million metric tons CO ₂ e, which exceeds our target of 41.7 million MT by 9.8 million MT. See 3.2a for more information on how we calculate emissions avoided.

ID	% complete (time)	% complete (emissions or renewable energy)	Comment
Abs2	100%	0%	Between 2012 and 2015, Praxair improved fuel efficiency in U.S. bulk trucking by 3.4%. Despite this fuel efficiency improvement, absolute GHG emissions in U.S. bulk trucking were 2% higher in 2015 than in 2012. In 2015, total mileage was over 6% higher than in 2012. This increase in mileage, due mainly to shipping liquid hydrogen longer distances in the U.S. in 2015, negated the improvements we saw in 2013 and 2014 in GHG emissions. While we were not able to make our target of 3% improvement in absolute GHG emissions from U.S. bulk trucking, we did make significant improvements in GHG emissions intensity from bulk trucking worldwide (see INT2).
Int1	100%	100%	We exceeded our Hydrogen production target to achieve a 2.4% improvement in GHG intensity by 2015, from a 2009 baseline. By the end of 2015, we had achieved a 3.3% improvement. This result was achieved with a combination of energy efficiency activities and because we procured by-product sources of hydrogen, which avoid GHG emissions resulting from steam methane reforming.
Int2	100%	100%	We exceeded our target to achieve a 9% improvement in GHG intensity in our bulk trucking by 2015, from a 2009 baseline. By the end of 2015, we had achieved an 11.1% improvement. Challenges to this group came from increased Argon deliveries in the U.S., which has the highest proportion of Praxair drivers in all Praxair businesses. This was largely offset by replacing truck delivery with rail at a U.S. plant, by a logistics reorganization in Korea, and by lower volumes delivered in 2015 compared to 2014.
Int3	100%	73%	We missed our ASU target to achieve a 6% improvement in GHG intensity by 2015, from a 2009 baseline. By the end of 2015, we had achieved a 4.4% improvement. This is due to an increase over the last two years in demand for argon, which, when produced on its own and without co-products, is more energy intensive than other products produced by our ASUs. If we remove the distortion from Argon production, Praxair energy and GHG efficiency improved by 6.4%, 2009-2015.
Int4	100%	100%	Praxair exceeded the target in South America to improve GHG intensity from contractor driving 1.5% per year. Our South American contract drivers improved GHG intensity by 2.2% in 2015, compared to 2014. This is partially due to a decrease in miles driven due to production decreases, but it is also due to fuel efficiency initiatives put in place by the business unit.

CC3.2 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

**CC3.2a
emissions**

Please provide details of your products and/or services that you classify as low carbon products or that enable a third party to avoid GHG

Level of aggregation	Description of product/Group of products	Are you reporting low carbon product/s or avoided emissions?	Taxonomy, project or methodology used to classify product/s as low carbon or to calculate avoided emissions	% revenue from low carbon product/s in the reporting year	% R&D in low carbon product/s in the reporting year	Comment
Group of products	<p>Praxair has a target to demonstrate and validate customer carbon productivity for selected products. Praxair’s carbon productivity has been calculated for four signature Praxair products in four markets:</p> <ul style="list-style-type: none"> • Hydrogen (H2) sold to make ultra-low sulfur diesel fuel (ULSD). When used in trucks fitted with diesel particulate filters, it eliminates black carbon. Environmental agencies, including a joint 2011 UNEP and World Meteorological Association report: “Integrated Assessment of Black Carbon and Tropospheric Ozone,” see the elimination of black carbon as being the crucial short-term strategy to reduce the rate of global warming. • Krypton sold to insulate thermal windows. • Oxygen (O2) sold to optimize combustion in steel making. • Argon for welding. These applications allow Praxair customers and their end users to avoid Scope 1 and Scope 2 energy-related GHG emissions. 	Avoided emissions	<p>Other: We provide a full description of our methodologies, including emission factors, assumptions and global warming potentials, at http://www.praxair.com/our-company/sustainable-development/climate-change/offsetting-climate-change. Example: Hydrogen - H2, a key growth platform for Praxair – is made from natural gas (CH4) and steam. The reaction of CH4 with water (H2O) produces H2 and emits CO2. In addition to enabling the reduction of sulfur from tailpipe emissions, when ultra-low sulfur diesel (ULSD) fuel is used in combination with a diesel particulate filter, 90% or more of black carbon (BC) emissions are eliminated. BC has a global warming potential of 2200. This is based on an analysis by L. Bruce Hill for the Clean Air Task Force, which also provided us with emission factors to convert diesel fuel consumption into total CO2e emissions with and without diesel particulate filters (for example, an emission factor of 1.2 grams/gallon to represent the BC emissions from a class 8 truck operating without a diesel particulate filter). The final claim for benefits from H2 production factored in that 33% of Praxair H2 production is used to make ULSD and that 58% of trucks in the USA are fitted with diesel particulate filters.</p>			<p>These four applications enabled customers and their end users to avoid 51.5 million metric tons of their Scope 1+2 CO2e in 2015. This includes 10 million MT avoided by the use of oxygen in steel making and 40 million MT avoided by the use of hydrogen in ultra-low sulfur diesel.</p>

CC3.3 Did you have emissions reduction initiatives that were active within the reporting year (this can include those in the planning and/or implementation phases)

Yes

CC3.3a
savings

Please identify the total number of projects at each stage of development, and for those in the implementation stages, the estimated CO2e

Stage of development	Number of projects	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	0	0
To be implemented*	10	4400
Implementation commenced*	502	127400
Implemented*	2230	393000
Not to be implemented	0	0

CC3.3b

For those initiatives implemented in the reporting year, please provide details in the table below

Activity type	Description of activity	Estimated annual CO2e savings (metric tonnes CO2e)	Scope	Voluntary/Mandatory	Annual monetary savings (unit currency - as specified in CC0.4)	Investment required (unit currency - as specified in CC0.4)	Payback period	Estimated lifetime of the initiative	Comment
Behavioral change	21 projects to convert customers from cylinders to 'microbulk' tanks or microbulk to on-site fixed tanks, which reduces number of delivery trips, thereby reducing GHG emissions.	200	Scope 1	Voluntary	400	10000000	4-10 years	Ongoing	
Behavioral change	77 projects innovatively revising business and office processes to reduce non-product transportation fuel consumption, secure alternative raw material sources for lower internal process energy consumption, lower power use for office equipment, and similar items.	9000	Scope 2 (location-based)	Voluntary	4900	0	1-3 years	Ongoing	These projects also resulted in a waste reduction of 47 tons.
Energy efficiency: Building services	31 voluntary projects providing permanent reduction in power consumption from lighting retrofits, HVAC controls and building power improvements.	700	Scope 2 (location-based)	Voluntary	200	2000000	1-3 years	Ongoing	

Activity type	Description of activity	Estimated annual CO2e savings (metric tonnes CO2e)	Scope	Voluntary/ Mandatory	Annual monetary savings (unit currency - as specified in CC0.4)	Investment required (unit currency - as specified in CC0.4)	Payback period	Estimated lifetime of the initiative	Comment
Energy efficiency: Processes	760 voluntary projects from 21 different countries providing permanent improvements to energy requirements for turbines, compressors, fans and other primary process equipment, improvement to heat transfer efficiency and control equipment for process efficiency and reliability optimization.	275000	Scope 1 Scope 2 (location-based)	Voluntary	65300	85000000	1-3 years	Ongoing	Foreign exchange rates reduced impact of savings in USD. These projects also saved over 38.5 million US gallons of water.
Process emissions reductions	64 projects in 14 different countries that reduced product CO2 and ODS emissions through reducing transfers, process efficiency, system integrity and refrigerant replacements.	400	Scope 1	Voluntary	2900	2000000	1-3 years	Ongoing	Includes contracts to reduce the need for Praxair operations that produce ozone-depleting substances. These projects also reduced hazardous waste by over 2 tons.
Transportation: fleet	760 voluntary projects around the globe provided permanent reduction in gasoline and diesel fuel use or fuel efficiency / route efficiency programs, on-site tank size optimization, trailer size optimization and truck modifications such as fairings & skirts for MPG efficiency.	52000	Scope 1	Voluntary	32000	15000000	1-3 years	Ongoing	Foreign exchange rates reduced impact of savings in USD.

CC3.3c What methods do you use to drive investment in emissions reduction activities?

Method	Comment
Dedicated budget for energy efficiency	As energy is a significant portion of Praxair's cost stack, Praxair pursues energy efficiency rigorously and in several areas. Praxair's sustainable productivity organization measures the environmental savings in our productivity work. In 2015, energy and GHG efficiency projects resulted in savings of more than \$105 million, about 585,000 MWh of electricity and 393,000 MT CO2e avoided. Each business unit has a significant capital budget for energy efficiency projects, which in 2015 was more than \$100 million.

Further Information

Praxair has developed a new generation of targets that run from 2016 to 2020 and include those that address climate change mitigation. These targets address energy savings, GHG efficiency improvements and increasing renewable energy purchases. These targets are described in the Outlook chapter of the 2015 Sustainable Value Report, available on <http://www.praxair.com/our-company/sustainable-development/reporting-center>. We will report performance against our 2020 GHG targets to CDP next year.

Page: CC4. Communication

CC4.1 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	Status	Page/Section reference	Attach the document	Comment
In mainstream reports (including an integrated report) but have not used the CDSB Framework	Complete	Item 1A Risks pages 7-8; Environmental Matters/Climate Change pages 22-23	https://www.cdp.net/sites/2016/27/15027/Climate Change 2016/Shared Documents/Attachments/CC4.1/Praxair2015AnnualReport.pdf	Praxair's 2015 Annual Report discusses risks related to climate change, including how those risks are managed.
In mainstream reports (including an integrated report) but have not used the CDSB Framework	Complete	Determining Strategic Non-financial goals, pages 44-46; Board Role in Risk Oversight, page 9	https://www.cdp.net/sites/2016/27/15027/Climate Change 2016/Shared Documents/Attachments/CC4.1/Praxair_Proxy_Statement_Mar 2016.pdf	Praxair's Notice of 2016 Annual Meeting and Shareholder Proxy discusses the Board's role in risk oversight, the non-financial goals of the company, including those related to environmental protection (which includes climate change), and how achieving the company's non-financial goals affects variable compensation.
In voluntary communications	Underway – previous year attached	2014 Sustainable Value Rpt pages 3, 9-10, 12-22, 23-24, 26-28, 33, 34, 35, 37-38	https://www.cdp.net/sites/2016/27/15027/Climate Change 2016/Shared Documents/Attachments/CC4.1/Praxair_2014_Sustainable_Value_Report.pdf	Praxair uses the IIRC Integrated Reporting Framework and GRI's Sustainability Reporting Guidelines as guides to develop the Sustainable Value Report (SVR). The 2015 SVR will be available on our website in early July at: http://www.praxair.com/our-company/sustainable-development/reporting-center

Publication	Status	Page/Section reference	Attach the document	Comment
In voluntary communications	Underway – previous year attached	2014 GRI Annex page 11, Environmental Aspect: Energy (EN3-7); Aspect: Emissions, Effluents & Emissions (EN16-18); Aspect: Products & Services (EN26); Aspect: Transport (EN29)	https://www.cdp.net/sites/2016/27/15027/Climate Change 2016/Shared Documents/Attachments/CC4.1/Praxair_2014_Sustainable_Value_Report ANNEX.pdf	In Praxair's 2014 GRI report, GRI's G3.1 guidelines were used. Praxair now uses GRI's G4 Sustainability Reporting Guidelines to structure public reporting of performance in key areas, including energy and GHG emissions performance. Our 2015 GRI report will be available on our website in early July at: http://www.praxair.com/our-company/sustainable-development/reporting-center

Further Information

Module: Risks and Opportunities

Page: CC5. Climate Change Risks

CC5.1 Have you identified any inherent climate change risks that have the potential to generate a substantive change in your business operations, revenue or expenditure? Tick all that apply

- Risks driven by changes in regulation
- Risks driven by changes in physical climate parameters
- Risks driven by changes in other climate-related developments

CC5.1a Please describe your inherent risks that are driven by changes in regulation

Risk Driver: Uncertainty surrounding new regulation

Description: Praxair operates in jurisdictions that have, or are developing, laws and/or regulations to reduce or mitigate the perceived adverse effects of greenhouse gas (“GHG”) emissions and faces a highly uncertain regulatory environment in this area. For example, the U.S. Environmental Protection Agency (“EPA”) has promulgated rules requiring reporting of GHG emissions, and Praxair and many of its suppliers and customers are subject to these rules. EPA has also promulgated regulations to restrict GHG emissions, including final rules regulating GHG emissions from light-duty vehicles and certain large manufacturing facilities, many of which are Praxair suppliers or customers. More recently, EPA promulgated carbon dioxide regulations for both new and existing power plants, which will require controls on GHG emissions from certain suppliers of power to Praxair’s operations. In addition to these developments in the United States, GHGs are regulated in the European Union under the Emissions Trading System, which has wide implications for our customers and may impact certain operations of Praxair in Europe. There are also requirements for mandatory reporting in Quebec, Canada, which apply to certain Praxair operations and will be used in developing cap-and-trade regulations on GHG emissions. These regulations, as well as similar regulations that have been proposed in Ontario, Canada, are expected to impact certain Praxair facilities in Canada. Climate change and energy efficiency laws and policies are also being widely introduced in jurisdictions throughout Latin America, Mexico and parts of Asia. China has announced plans to launch a national carbon emissions trading system, though it does not appear the regulations will have a direct impact on GHG emissions from Praxair facilities.

Among other impacts, such regulations are expected to raise the costs of energy, which is a significant cost for Praxair. Legislation that limits GHG emissions may impact growth by increasing operating costs and/or decreasing demand.

Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Increased operational cost	Up to 1 year	Direct	More likely than not	Medium	<p>Among other impacts, cap and trade schemes are expected to raise the cost of energy, which is a significant cost for Praxair. Also, legislation that limits GHG emissions may impact growth in this area by increasing operating costs and/or decreasing demand. For example, if energy prices rise 10%, energy costs to Praxair would rise proportionally and could exceed \$100 million.</p>	<p>To manage risks from current and potential GHG emission regulation, Praxair actively monitors regulatory developments, increases relevant resources and training as needed; consults with vendors, insurance providers and industry experts; incorporates GHG provisions in commercial agreements; conducts regular sensitivity analyses of the impacts of potential energy and raw material cost increases; presents to the Office of the Chairman and Board on various cost scenarios under different potential GHG tax regimes; and explores renewable energy options. Praxair's commercial contracts also routinely provide rights to recover increased electricity, natural gas, and other costs that are incurred by the company.</p> <p>Additionally, Praxair sets corporate energy and GHG targets to manage the risks of an uncertain regulatory environment. These targets drive us to continuously seek opportunities to reduce energy use and GHG emissions. For example: Certain Praxair hydrogen plants have a target to improve GHG intensity 2.4% (2009-2015). This target was exceeded in 2015: These hydrogen plants improved GHG intensity by 3.3%. This result was due to increased energy and GHG efficiency and an increase in byproduct sourcing of hydrogen, which is less GHG-intensive than using natural gas as a feedstock.</p> <p>All of our risk management methods, including our targets, limit the likelihood and magnitude of increased cost from new regulation and reduce the risks to Praxair over the target period (5 years).</p>	<p>Praxair believes it will continue to mitigate potential costs through the pass through clauses of its product supply contracts.</p> <p>Praxair also manages these risks by investing in energy and GHG efficiency projects, which help us to meet our energy and GHG targets. In 2015, this investment was over \$100 million.</p>

CC5.1b Please describe your inherent risks that are driven by changes in physical climate parameters

Risk Driver: Change in precipitation extremes and droughts

Description: The occurrence of catastrophic events or natural disasters such as extreme weather, including hurricanes and floods, could disrupt or delay the company's ability to produce and distribute its products to customers and could potentially expose the company to third-party liability claims. In addition, such events could impact the company's customers and suppliers resulting in temporary or long-term outages and/or the limitation of supply of energy or other raw materials used in normal business operations.

Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Reduction/ disruption in production capacity	>6 years	Direct	About as likely as not	Medium-high	The most important risk is to human safety. On the financial side, the replacement cost of a single large Praxair facility could be more than \$200 million. On a long-term average annual basis, the Praxair, Inc. portfolio could sustain potentially over \$3 million in hurricane losses.	<p>To manage these risks, Praxair continuously monitors current developments; evaluates direct and indirect business risks; consults with vendors, insurance providers and industry experts; makes investments in suitably resilient design and technology; and conducts regular reviews of the business risks with management.</p> <p>Praxair works with its insurance provider to evaluate the risk from all perils including natural hazards such as extreme weather, windstorm and flooding. The insurer uses rigorous standards based on their own scientific research and proven solutions that often go beyond national recommendations (e.g. FEMA maps, NFPA codes) to identify and quantify exposures to Praxair assets. Based on their recommendations, Praxair may make investments in infrastructure that adapts to or mitigates risks from anticipated climate change. For example: As part of the siting considerations for Praxair's new data center, a review of the flooding and storm water exposures was undertaken. The finished floor elevations were set to ensure no storm water would enter the data center during heavy rains.</p> <p>Our risk management methods limit the potential likelihood and magnitude of a disruption in production capacity due to extreme weather events. When constructing a new site, evaluations provided by our insurance provider can reduce risk in as little as one year.</p>	Praxair annually spends in excess of \$20,000 to study its natural catastrophe risk. The service provides, among other items, detailed evaluations by geography of emerging hurricane and flooding vulnerability and likelihood of incidence of extreme weather.

CC5.1c Please describe your inherent risks that are driven by changes in other climate-related developments

Risk Driver: Reputation

Description: Praxair uses energy and seeks to continually improve its energy efficiency; and its applications often bring energy efficiency, as well as environmental and GHG improvements, to customer processes. Some customers are seeking to reduce GHG emissions in their supply chain and ask Praxair to provide information, e.g. with the CDP Supply Chain program, and/or to help meet their targets. If Praxair does not or cannot meet these expectations the company could lose business from that customer.

Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Reduced demand for goods/services	3 to 5 years	Direct	Unlikely	Low	The estimated financial implication could be over \$1 million in annual sales.	<p>Praxair manages risks to reputation by communicating with customers and the public to demonstrate that its applications create a net GHG benefit. For example, Praxair invested in research to calculate and validate its Carbon Footprint. We promote this research in public communications to help tell our story and manage the risk from our GHG emissions profile to our reputation. Praxair’s carbon productivity was calculated for four signature Praxair products in four markets: Hydrogen used to make ultra-low sulfur diesel fuel (used in vehicles with diesel particulate filters); Krypton used to insulate thermal windows; Argon sold for welding; and Oxygen used to optimize combustion in steelmaking. In 2015 these markets contributed some 11% of sales. Praxair applications enabled customers and their end users to avoid 51.5 million metric tons of CO2e – an amount that exceeded all Praxair GHG emissions by 30.7 million metric tons. This research and results are offered as part of Praxair’s communication to external stakeholders, including on our website and in our SD report, which we publish annually.</p> <p>By being transparent about the GHG impacts of our operations and the GHG benefits of our applications, Praxair limits both the likelihood and magnitude of reduced demand for our products and services due to damage to our reputation. We communicate with our stakeholders regularly, which reduces our risk on an ongoing basis.</p>	Praxair conducted the research in-house with subject-matter experts. We paid external providers for the validation audits. This amount was less than \$50,000.

Risk Driver: Uncertainty in market signals

Description: Cost and Availability of Raw Materials and Energy – Increases in the cost of energy and raw materials and/or disruption in the supply of these materials could result in lost sales or reduced profitability. Energy is the single largest cost item in the production and distribution of industrial gases. Most of Praxair’s energy requirements are in the form of electricity, natural gas and diesel fuel for distribution. Praxair attempts to minimize the financial impact of variability in these costs through the management of customer contracts and reducing demand through operational productivity and energy efficiency. Large customer contracts typically have escalation and pass-through clauses to recover energy and feedstock costs. Such attempts may not successfully mitigate cost variability which could negatively impact its financial condition or results of operations. The supply of energy has not been a significant issue in the geographic areas where Praxair conducts business. However, regional energy conditions are unpredictable and may pose future risk.

For carbon dioxide, carbon monoxide, helium, hydrogen, specialty gases and surface technologies, raw materials are largely purchased from outside sources. Where feasible, Praxair sources several of these gases, including carbon dioxide, hydrogen and calcium carbide, as chemical or industrial byproducts. In addition, Praxair has contracts or commitments for, or readily available sources of, most of these raw materials; however, their long-term availability and prices are subject to market conditions. A disruption in supply of such raw materials could impact the company’s ability to meet contractual supply commitments.

Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Increased operational cost	1 to 3 years	Indirect (Supply chain)	About as likely as not	Medium	<p>Energy availability and price is unpredictable and may pose unforeseen future risks. For example, if energy prices rise 10%, energy costs to Praxair would rise proportionally and could exceed \$100 million. In addition, if raw materials became unavailable and Praxair was unable to meet its contractual obligations to customers, the company could potentially incur a loss up to the limits of its contractual liability.</p>	<p>Praxair performs long-term assessments of energy supply cost and reliability when making capital investment decisions to help manage the risk of energy supply and cost volatility, which are material to the internal rate of return and net present value of capital investment projects. Praxair also includes escalation and pass-through clauses in customer contracts to recover energy and feedstock costs.</p> <p>Praxair pursues a range of actions to secure multiple sources of raw materials. For example, in Texas, Praxair uses a 2.5 billion standard cubic foot high-purity hydrogen storage cavern. This, together with sourcing by-product hydrogen, provides Praxair and our customers with confidence that we can provide a reliable service over our long-term contracts.</p> <p>Finally, Praxair rigorously pursues energy efficiency, invests in renewable energy, and has set energy and GHG intensity targets to minimize risks related to energy cost and availability. Praxair has targets to improve the GHG efficiency of its bulk trucking, ASUs and hydrogen plants (through 2015; 2009 baseline). These targets have largely been met, and some have even been exceeded.</p> <p>Praxair's management methods reduce the likelihood that disruptions in the supply of energy will have a major impact on operational cost. These investments also reduce the potential magnitude of such disruptions. We make investments in energy efficiency and renewable energy annually, which reduces potential risk on an ongoing basis.</p>	<p>Many of the management methods of these potential risks have zero additional financial impact and are managed within Praxair's human and capital resources and budgets.</p> <p>Praxair invests in energy and GHG efficiency projects, which help us to meet our energy and GHG targets. In 2015, this investment was about \$100 million.</p>

CC6.1 Have you identified any inherent climate change opportunities that have the potential to generate a substantive change in your business operations, revenue or expenditure? Tick all that apply

Opportunities driven by changes in regulation

Opportunities driven by changes in physical climate parameters

Opportunities driven by changes in other climate-related developments

CC6.1a Please describe your inherent opportunities that are driven by changes in regulation

Opportunity Driver: General environmental regulations, including planning

Description: Governmental regulation of GHG and other emissions; renewable fuel standards in the EU and U.S.; the need for infrastructure build out in mature and developing economies (especially with the levels of growth being experienced in global mega-cities) - all these provide Praxair with market opportunities in applications like water technologies, carbon capture and sequestration (CCS) and industrial gases.

The renewable energy market is a growth area for Praxair. Praxair supports the photovoltaics market, a key player in the growth of renewable energy. We offer a complete portfolio of solar-grade atmospheric, specialty and dopant gases, delivery systems and sputtering targets, to help customers meet today’s economic and environmental demands and position them to exceed these demands in the future. For example, Praxair manufactures Argon, a critical gas used in solar wafer production. Praxair also supplies Silane, a key raw material for the thin film deposition of amorphous and polysilicon films in the solar industry.

Potential impact	Time frame	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Increased demand for existing products/ services	1 to 3 years	Indirect (Client)	More likely than not	Medium	<p>Our eco portfolio – applications that help customers reduce their environmental footprint – was 33% of Praxair’s 2015 revenue, or \$3.5 billion.</p> <p>Our eco portfolio is made up of numerous applications serving numerous markets. For example, the global water and wastewater network market is expected to grow at a compound annual growth rate of 9.6% from 2014 to 2020. Industry experts expect that the demand for water treatment products in China alone will grow 10.3 percent annually to \$7.5 billion in 2015. Wastewater is an \$80 million end market for Praxair and is growing at >10% per year, 2012 – 2016. This represented a market opportunity of about \$10 million in 2015. 2nd generation biofuels use industrial and specialty gases at many points in their supply chain and provided a potential ~\$100 million gases market in 2015.</p> <p>If applications meet the eco portfolio target, this has a direct impact on Praxair’s profitability and growth.</p>	<p>Praxair’s research and development is directed toward developing new and improved methods for the production and distribution of industrial gases and the development of new markets and applications for these gases. The R&D group has set a target for 2015 that Praxair’s eco portfolio should equal or exceed 30% of revenue, or more than \$3 billion of revenue by 2015. In 2015, Praxair’s eco portfolio was 33% of revenue.</p> <p>For example, Praxair is providing liquid hydrogen to fuel cell makers as a transportation fuel. In 2015, Praxair announced an agreement with a fuel cell manufacturer that pairs the customer’s GenFuel hydrogen fueling infrastructure solution with Praxair’s liquid hydrogen supply capability. Praxair is one of the largest suppliers of carbon-free Merchant Hydrogen in the U.S. To meet additional demand from this agreement, Praxair completed construction in 2015 of a new Steam Methane Reformer that increased Praxair’s Niagara Falls liquid hydrogen production capacity by 50%.</p> <p>By setting targets for our eco portfolio, Praxair is able to increase the likelihood and magnitude of new environmental regulations leading to increased demand for our products and applications. We expect these opportunities to materialize within the next 3 years.</p>	<p>There was no additional cost for actions taken, outside of regular budgeted staff and business costs in this area, including for R&D. A portion of the total R&D expenditure in 2015 (\$93 million) went to develop the applications and processes described in this section. An external auditor was paid to validate claims for CO2e avoided from Praxair oxygen and hydrogen applications, and this was less than \$50,000 in fees.</p>

CC6.1b Please describe the inherent opportunities that are driven by changes in physical climate parameters

Opportunity Driver: Change in precipitation extremes and droughts

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

Also, as the global demand for potable water continues to rise and fresh water supplies are quickly depleting, we are advancing industrial technology to make this life-sustaining resource accessible to a growing population. Last year alone, we helped bring clean drinking water to more than 125 million people around the world.

Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Increased demand for existing products/services	1 to 3 years	Indirect (Client)	More likely than not	Medium	<p>The potential financial implications can be calculated from the size of the market and the size of Praxair's opportunity. The global water and wastewater network market is expected to grow at a compound annual growth rate of 9.6% from 2014 to 2020. Industry experts expect that the demand for water treatment products in China alone will grow 10.3 percent annually to \$7.5 billion in 2015. Wastewater is an \$80 million end market for Praxair and is growing at >10% per year, 2012 – 2016. This represented a market opportunity of about \$10 million in 2015.</p>	<p>Praxair's water business is supported by a business development group, which is actively investing in innovation and business development. Praxair has identified the need for massive water infrastructure development. For example: Praxair has signed a long-term gas supply contract with Gao Bei Dian Water Recycling Plant of Beijing Drainage Group Co., Ltd. Praxair will build, own and operate a vacuum pressure swing adsorption unit to supply gaseous oxygen to the plant for its wastewater treatment and recycling processes. The plant treats wastewater from municipal drainage and uses the recycled product as cooling water for local power plants as well as for landscaping needs throughout the city. The plant helps to mitigate water shortages and supports the city's sustainable development efforts.</p> <p>To maintain this innovation stream, Praxair R&D developed a target that Praxair's eco portfolio should equal or exceed 30% of sales, or more than \$3 billion of revenue by 2015. In 2015, our eco portfolio was 33% of revenue or \$3.5 billion.</p> <p>By setting a target for our eco portfolio, Praxair is able to increase the likelihood and magnitude of our opportunity to increase demand for products and applications that help companies manage changes in precipitation extremes. We expect these opportunities to materialize within the next 3 years.</p>	<p>There was zero additional cost for actions taken, outside of regular budgeted staff and business costs in this area, including for R&D. A portion of the total R&D expenditure in 2015 (\$93 million) went to develop the applications and processes described in this section.</p>

CC6.1c Please describe the inherent opportunities that are driven by changes in other climate-related developments

Opportunity Driver: Changing consumer behaviour

Description: As more and more companies and individuals acknowledge climate change and its impacts, they will demand new products and services to mitigate the effects of climate change, or plan for adaptation. These play out in different ways in different geographies, but they include the need for infrastructure build outs for water systems; technology to provide more resource efficiency; and energy security and reliability. These provide market opportunity for Praxair, as we provide gases into all these markets, e.g., nitrogen to make lighter composites to make aircraft more fuel efficient; alloys to make wind turbines more durable; CO2 to make water more potable and to clean wastewater systems. These gases are some of the gases sold into Praxair’s end-markets in electronics (8% revenue), aerospace (3%) and “other” (8%), and that provide growth opportunities as markets continue to grow for climate-related technologies.

Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
New products/ business services	Up to 1 year	Indirect (Client)	More likely than not	Medium	<p>Solar energy: Praxair sales are forecasted to grow from \$60 million at ~ 5% per year. 2nd generation biofuels use industrial and specialty gases at many points in their supply chain and provided a potential ~\$100 million gases market in 2015.</p>	<p>Praxair is actively investing in innovation and business development in order to meet customer demand for products with a lower carbon footprint. To maintain an environmental innovation stream, Praxair had a target that our eco portfolio - applications that bring customers environmental benefit - should equal or exceed 30% of revenue, or more than \$3 billion revenue by 2015. In 2015, Praxair's eco portfolio was 33% of revenue, or \$3.5 billion. This focus on environmental innovation is yielding positive market results and a new target has been set for 2016-2020. Praxair's Global Market Development organization raises awareness of applications within our eco portfolio across a broad range of markets and regions. For example, in photovoltaics, Praxair is developing and promoting the use of its products throughout the PV supply chain.</p> <p>We also raise awareness by providing information about products in our eco portfolio on our website. For example, we show how Praxair CO2 can be used in industrial applications where the carbon is chemically "fixed" and not emitted to the atmosphere; see Praxair.com/our-company/sustainable-development/climate-change.</p> <p>By working towards the eco portfolio target, Praxair is able to increase the likelihood and magnitude of our opportunity to meet consumers' demands for climate friendly products and applications. We expect these opportunities to materialize regularly, as we are constantly looking for ways to increase our eco portfolio.</p>	<p>There was no additional cost for actions taken, outside of regular budgeted staff and business costs in this area, including for R&D. A portion of the total R&D expenditure in 2015 (\$93 million) went to develop the applications and processes described in this section.</p>

Further Information

Module: GHG Emissions Accounting, Energy and Fuel Use, and Trading

Page: CC7. Emissions Methodology

CC7.1 Please provide your base year and base year emissions (Scopes 1 and 2)

Scope	Base year	Base year emissions (metric tonnes CO2e)
Scope 1	Thu 01 Jan 2009 - Thu 31 Dec 2009	4163000
Scope 2 (location-based)	Thu 01 Jan 2009 - Thu 31 Dec 2009	9317000
Scope 2 (market-based)	Thu 01 Jan 2009 - Thu 31 Dec 2009	

CC7.2 emissions Please give the name of the standard, protocol or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 emissions

Please select the published methodologies that you use
The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)
US EPA Mandatory Greenhouse Gas Reporting Rule
Other

CC7.2a If you have selected "Other" in CC7.2 please provide details of the standard, protocol or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 emissions

The California ARB Regulation for the Reporting of Greenhouse Gas Emissions

CC7.3 Please give the source for the global warming potentials you have used

Gas	Reference
CO2	IPCC Fourth Assessment Report (AR4 - 100 year)
CH4	IPCC Fourth Assessment Report (AR4 - 100 year)
N2O	IPCC Fourth Assessment Report (AR4 - 100 year)
SF6	IPCC Fourth Assessment Report (AR4 - 100 year)
HFCs	IPCC Fourth Assessment Report (AR4 - 100 year)

CC7.4 Please give the emissions factors you have applied and their origin; alternatively, please attach an Excel spreadsheet with this data at the bottom of this page

Fuel/Material/Energy	Emission Factor	Unit	Reference
Diesel/Gas oil	22.4	lb CO2e per gallon	US EPA AP 42
Natural gas	120	lb CO2e per 1000 ft3	US EPA AP 42
Distillate fuel oil No 2	223	lb CO2 per gallon	US EPA AP 42

Further Information

Attachments

<https://www.cdp.net/sites/2016/27/15027/Climate Change 2016/Shared Documents/Attachments/ClimateChange2016/CC7.EmissionsMethodology/EFs for Electricity Praxair.xlsx>

Page: CC8. Emissions Data - (1 Jan 2015 - 31 Dec 2015)

CC8.1 Please select the boundary you are using for your Scope 1 and 2 greenhouse gas inventory

Financial control

CC8.2 Please provide your gross global Scope 1 emissions figures in metric tonnes CO2e

8199000

CC8.3 Does your company have any operations in markets providing product or supplier specific data in the form of contractual instruments?

Yes

CC8.3a Please provide your gross global Scope 2 emissions figures in metric tonnes CO2e

Scope 2, location-based	Scope 2, market-based (if applicable)	Comment
12640000	12530000	Praxair bases our external reporting of Scope 2 emissions on the location-based method. For the purposes of responding to CDP, we calculated Scope 2 using the market-based approach by calculating the amount of CO2e that we could deduct for the 5 facilities operating under power purchase agreements for renewable energy. We deducted 110,000 metric tons CO2e from our Scope 2 location-based total to arrive at the market-based value.

CC8.4 Are there are any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure?

Yes

CC8.4a Please provide details of the sources of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure

Source	Relevance of Scope 1 emissions from this source	Relevance of location-based Scope 2 emissions from this source	Relevance of market-based Scope 2 emissions from this source (if applicable)	Explain why the source is excluded
Electricity use at very small sites	No emissions excluded	Emissions are not relevant	Emissions are not relevant	Praxair has a number of very small office sites, many with 1-2 people. We estimated the emissions from these sites and, as they represent less than 1% of our Scope 2 emissions, consider them to be de minimis.

CC8.5 Please estimate the level of uncertainty of the total gross global Scope 1 and 2 emissions figures that you have supplied and specify the sources of uncertainty in your data gathering, handling and calculations

Scope	Uncertainty range	Main sources of uncertainty	Please expand on the uncertainty in your data
Scope 1	More than 2% but less than or equal to 5%	Assumptions Metering/ Measurement Constraints	Our Sustainable Development Management System was implemented in 2011, requiring monthly sign-off from all businesses of their results versus corporate GHG targets and a quarterly review by the Office of the Chairman. This creates a level of internal oversight and management over our GHG emissions data. Most of Praxair Scope 1 emissions are from hydrogen production, much of which is made from natural gas (CH ₄). GHG emissions from hydrogen production are based on assumptions that all carbon in the natural gas is converted into CO ₂ and is emitted unless there are additional carbon-based products such as CO, methanol or formaldehyde; or if the hydrogen is by-product sourced. There are some measurement constraints in regards to all the data needed to do this material balance such as variability in carbon content in the natural gas, meter reading availability of the different raw materials, as well as the type of products produced. In addition, natural gas data at our Packaged Gas and PST sites is collected only once every three years. This represents less than 2.5% of our total emissions, and does not warrant the level of effort for collecting this data annually.
Scope 2 (location-based)	More than 2% but less than or equal to 5%	Assumptions Metering/ Measurement Constraints	Our Sustainable Development Management System was implemented in 2011, requiring monthly sign-off from all businesses of their results vs. corporate GHG targets and a quarterly review by the Office of the Chairman. This creates a level of internal oversight and management over our GHG emissions data. Standard Plants represent about 8% of Praxair's Scope 2 emissions. Praxair does not pay for or meter the electricity at these sites, as these plants are on customer sites and the customer pays the electricity. These emissions are estimated once every three years because actual activity data is not available. Praxair uses assumptions based on similar plants that we own and operate. In addition, we have a small number of owned corporate offices that account for less than 1% of our Scope 2 emissions. This data is collected once every three years from the larger offices, and estimated based on square footage for the smaller of these offices. Because of the small contribution to our emissions total, this category does not warrant the level of effort to collect and calculate emissions annually.
Scope 2 (market-based)	More than 2% but less than or equal to 5%	Assumptions Metering/ Measurement Constraints	The uncertainty range and sources of uncertainty related to calculating Scope 2 emissions using the market-based approach are the same as the location-based approach described above.

CC8.6 Please indicate the verification/assurance status that applies to your reported Scope 1 emissions

Third party verification or assurance process in place

CC8.6a Please provide further details of the verification/assurance undertaken for your Scope 1 emissions, and attach the relevant statements

Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/section reference	Relevant standard	Proportion of reported Scope 1 emissions verified (%)
Annual process	Complete	Moderate assurance	AA1000AS Assurance Statement – 2016.pdf	Page 1&2 - audit cycle, scope of audit, reporting year, type of assurance, assurance standard used; page 3 - findings; page 5 - audited KPI values, proportion of reported emissions verified	AA1000AS	100

CC8.7 Please indicate the verification/assurance status that applies to at least one of your reported Scope 2 emissions figures

Third party verification or assurance process in place

CC8.7a Please provide further details of the verification/assurance undertaken for your location-based and/or market-based Scope 2 emissions, and attach the relevant statements

Location-based or market-based figure?	Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/Section reference	Relevant standard	Proportion of reported Scope 2 emissions verified (%)
Location-based	Annual process	Complete	Moderate assurance	AA1000AS Assurance Statement – 2016.pdf	Page 1&2 - audit cycle, scope of audit, reporting year, type of assurance, assurance standard used; page 3 - findings; page 5 - audited KPI values, proportion of reported emissions verified	AA1000AS	100

CC8.8 Please identify if any data points have been verified as part of the third party verification work undertaken, other than the verification of emissions figures reported in CC8.6, CC8.7 and CC14.2

Additional data points verified	Comment
Year on year change in emissions (Scope 2)	Praxair's Scope 2 emissions account for 61% of emissions (not including Scope 3). Electricity accounts for a significant portion of Praxair's operational spend, and we invest heavily in energy efficiency, especially at our ASUs, which comprise 84% of our Scope 2 emissions. We had the year on year change in Scope 2 emissions verified, and these emissions increased by 1%.

CC8.9 Are carbon dioxide emissions from biologically sequestered carbon relevant to your organization?

No

Further Information

Page: CC9. Scope 1 Emissions Breakdown - (1 Jan 2015 - 31 Dec 2015)

CC9.1 Do you have Scope 1 emissions sources in more than one country?

Yes

CC9.1a Please break down your total gross global Scope 1 emissions by country/region

Country/Region	Scope 1 metric tonnes CO2e
North America	7991000
South America	93000
Europe	46000
Asia, Australasia, Middle East and Africa	69000

CC9.2 Please indicate which other Scope 1 emissions breakdowns you are able to provide (tick all that apply)

By business division

By GHG type

CC9.2a Please break down your total gross global Scope 1 emissions by business division

Business division	Scope 1 emissions (metric tonnes CO2e)
ASUs	490000
Hydrogen Plants	7021000
CO2 Plants	241000
Packaged Gas	160000
Electronics+Surface Technologies	23000
Helium Plants	0
Trucking	260000
Corporate Offices	4000

CC9.2c Please break down your total gross global Scope 1 emissions by GHG type

GHG type	Scope 1 emissions (metric tonnes CO2e)
CO2	7993000
N2O	63000
SF6	19000
HFCs	123000
CH4	1000

Further Information

Page: CC10. Scope 2 Emissions Breakdown - (1 Jan 2015 - 31 Dec 2015)

CC10.1 Do you have Scope 2 emissions sources in more than one country?

Yes

CC10.1a Please break down your total gross global Scope 2 emissions and energy consumption by country/region

Country/Region	Scope 2, location-based (metric tonnes CO2e)	Scope 2, market-based (metric tonnes 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)
North America	6455000	6371000	11065000	325000
South America	437000	434000	3767000	49000
Europe	1169000	1169000	2841000	
Asia, Australasia, Middle East and Africa	4579000	4556000	6092000	26000

CC10.2 Please indicate which other Scope 2 emissions breakdowns you are able to provide (tick all that apply)

By business division

CC10.2a Please break down your total gross global Scope 2 emissions by business division

Business division	Scope 2 emissions, location based (metric tonnes CO2e)	Scope 2 emissions, market-based (metric tonnes CO2e)
ASUs	10667000	10597000
Hydrogen Plants	526000	492000
CO2 Plants	221000	221000
Packaged Gas	120000	120000
Electronics + Surface Technologies	41000	41000
Helium Plants	31000	31000
Standard Plants	1028000	1028000
Trucking	0	0
Corporate Offices	6000	0

Further Information

Page: CC11. Energy

CC11.1 What percentage of your total operational spend in the reporting year was on energy?

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

CC11.2 Please state how much heat, steam, and cooling in MWh your organization has purchased and consumed during the reporting year

Energy type	Energy purchased and consumed (MWh)
Heat	0
Steam	806000
Cooling	0

CC11.3 Please state how much fuel in MWh your organization has consumed (for energy purposes) during the reporting year

3155000

CC11.3a Please complete the table by breaking down the total "Fuel" figure entered above by fuel type

Fuels	MWh
Natural gas	2796000
Distillate fuel oil No 2	5000
Diesel/Gas oil	354000

CC11.4 Please provide details of the electricity, heat, steam or cooling amounts that were accounted at a low carbon emission factor in the market-based Scope 2 figure reported in CC8.3a

Basis for applying a low carbon emission factor	MWh consumed associated with low carbon electricity, heat, steam or cooling	Comment
Contract with suppliers or utilities, with a supplier-specific emission rate, not backed by electricity attribute certificates	400000	<p>Praxair uses the location-based method to calculate 100% of Scope 2 emissions. For the purposes of responding to CDP, we calculated the emissions that are avoided by our renewable energy power purchase agreements.</p> <p>1) Our facilities in upstate New York have a power contract with the utility for hydropower. These facilities include a corporate office, an air separation unit, and a hydrogen plant. 2) In Brazil, Praxair buys renewable energy from a small hydroelectric plant. 3) One facility in India (air separation unit) used wind power in 2015. A second facility will begin using wind power in 2016.</p> <p>Combined, these instances account for 400,000 MWh of renewable electricity, or about 2% of the total electricity that Praxair purchases. They avoid 110,000 MT CO₂e.</p>

CC11.5 Please report how much electricity you produce in MWh, and how much electricity you consume in MWh

Total electricity consumed (MWh)	Consumed electricity that is purchased (MWh)	Total electricity produced (MWh)	Total renewable electricity produced (MWh)	Consumed renewable electricity that is produced by company (MWh)	Comment
22960000	22960000	0	0	0	Praxair uses renewable energy but does not produce it.

Further Information

CC12.1 How do your gross global emissions (Scope 1 and 2 combined) for the reporting year compare to the previous year?

Increased

CC12.1a Please 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

Reason	Emissions value (percentage)	Direction of change	Please explain and include calculation
Emissions reduction activities	2	Decrease	Emissions decreased 2% due to energy efficiency and other GHG emissions reduction activities, including new purchases of low carbon energy (as reported in question 11.4). This percent was derived by dividing 393,000 MT CO2e saved (as reported in question 3.3a) by Praxair's 2014 Scope 1+2 total of 20,245,000 MT CO2e * 100 to arrive at 2%.
Divestment			
Acquisitions			
Mergers			
Change in output	5	Increase	Emissions in 2015 were 3% higher than in 2014. Had Praxair not undertaken emissions reduction activities, emissions would have been 5% higher (sum of reported 2015 Scope 1+2 of 20,839,000 MT CO2e + 393,000 MT from emissions reductions activities, minus 2014 reported Scope 1+2 emissions of 20,245,000 MT, divided by 20,245,000 *100). Overall, production decreased by 1% between 2014 and 2015. Most of the decrease in production occurred in South America, where the source of electricity has a very low CO2e/Kwh. However, production increased in countries with a very high CO2e/Kwh, such as China and India. This led to the overall increase in total GHG emissions.
Change in methodology			
Change in boundary			
Change in physical operating conditions			
Unidentified			
Other			

CC12.1b Is your emissions performance calculations in CC12.1 and CC12.1a based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?

Location-based

CC12.2 Please describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tonnes CO2e per unit currency total revenue

Intensity figure =	Metric numerator (Gross global combined Scope 1 and 2 emissions)	Metric denominator: Unit total revenue	Scope 2 figure used	% change from previous year	Direction of change from previous year	Reason for change
0.0019	metric tonnes CO2e	10776000000	Location-based	17	Increase	Gross emissions increased by 3%, but total revenue decreased by 12%.

CC12.3 Please provide any additional intensity (normalized) metrics that are appropriate to your business operations

Intensity figure =	Metric numerator (Gross global combined Scope 1 and 2 emissions)	Metric denominator: Unit total revenue	Scope 2 figure used	% change from previous year	Direction of change from previous year	Reason for change	Intensity figure =
1655	metric tonnes CO2e	Other: Total revenue ex-currency fluctuation	12592000	Location-based	5	Increase	After removing the currency fluctuations from total revenue, constant currency decreased by 2%, while emissions increased by 3%. We report this intensity metric to show the effect of currency headwinds on our intensity results (the intensity from 2014 to 2015 is 12% worse when revenue is used instead of constant currency). (Note, CDP only allows 9 figures in metric denominator box. The real value is \$12,592,000,000 and the intensity figure is 0.001655.)

Further Information

Page: CC13. Emissions Trading

CC13.1 Do you participate in any emissions trading schemes?

Yes

CC13.1a Please complete the following table for each of the emission trading schemes in which you participate

Scheme name	Period for which data is supplied	Allowances allocated	Allowances purchased	Verified emissions in metric tonnes CO2e	Details of ownership
California's Greenhouse Gas Cap and Trade Program	Thu 01 Jan 2015 - Thu 31 Dec 2015	39481	10500	41690	Facilities we own and operate
Other: Quebec Cap and Trade Program	Thu 01 Jan 2015 - Thu 31 Dec 2015	36786	4733	41609	Facilities we own and operate

CC13.1b What is your strategy for complying with the schemes in which you participate or anticipate participating?

Praxair stays current with developments in global regulations. While Praxair is not covered under the EU Emissions Trading Scheme (ETS), we do have facilities that are part of California's Cap and Trade program and the UK's Climate Change Agreement (the UK program is part of their carbon tax program; it is not a trading scheme). These are all regulated programs; Praxair does not trade allowances in voluntary speculative trading schemes. An entirely robust estimation of the future demands of these trading schemes is not possible. However, Praxair is prepared to participate in these schemes by having an adequate and flexible GHG strategy. This takes into account all kinds of emissions reduction measures, e.g. use of abatement technology, increase in energy efficiency, as well as the use of project-based carbon credits and, in the eventual case of ETS, a purchase strategy for EUAs. Praxair's customer contracts pass through increases in the cost of energy, and would also pass through allowance purchases.

If Praxair comes under additional regulated emissions trading regimes such as ETS, we will participate.

CC13.2 Has your organization originated any project-based carbon credits or purchased any within the reporting period?

Yes

CC13.2a Please provide details on the project-based carbon credits originated or purchased by your organization in the reporting period

Credit origination or credit purchase	Project type	Project identification	Verified to which standard	Number of credits (metric tonnes of CO2e)	Number of credits (metric tonnes CO2e): Risk adjusted volume	Credits cancelled	Purpose, e.g. compliance
Credit purchase	Forests	The Rio Bravo Climate Action Project, a 15,550-acre area of tropical forest located in northwest Belize, registered by the Nature Conservancy. This is Praxair's fourth year with this project and fourth purchase of the same number of credits.	VCS (Verified Carbon Standard)	667	667	Yes	Voluntary Offsetting
Credit purchase	Forests	To meet part of our compliance obligation under the California Cap & Trade Program, we purchased 5,000 MT of CO2 offset credits from The Nature Conservancy that were generated by the Clinch Valley, Virginia, Conservation Forestry Program. This is a unique partnership between the Conservancy and private landowners aimed at sustaining the productivity and biological health of "working forests."	CAR (The Climate Action Reserve)	5000	5000	Yes	Compliance

Further Information

Quebec's Cap and Trade Program requires Praxair to obtain emissions credits for CO2 that leaves as product. Therefore, the emissions reported above in 13.1a are higher than the emissions Praxair uses to calculate its GHG inventory, since Praxair does not count product CO2 in its GHG emissions inventory.

CC14.1 Please account for your organization’s Scope 3 emissions, disclosing and explaining any exclusions

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
Purchased goods and services	Not relevant, explanation provided				Praxair's largest purchased good is energy, such as electricity to operate our facilities and natural gas to make hydrogen. Details on our energy purchases and emissions are provided in sections CC7-CC11 of this report. Other goods and services purchased by Praxair include logistics and transportation services, office infrastructure requirements and administrative benefits and services. In the rows below, we detail our largest upstream emissions from the purchase of capital goods and upstream energy-related emissions. In 2012 and 2013, we estimated emissions from our consumption of paper using the U.S. EPA’s WARM methodology. These emissions, along with emissions from the remaining upstream goods and services, are less than 0.1% of our Scope 3 footprint and are considered to be not relevant when compared to our energy-related activities.
Capital goods	Relevant, calculated	505000	The principal material Praxair procures for capital projects is steel. Based on our annual spend, we used our Steelfirst subscription to calculate the price of carbon steel per country. The weight of steel was then calculated as price per ton divided into spend. Related GHG emissions were calculated by multiplying the weight of the carbon steel using a GHG emission factor derived from the U.S. EPA (0.87 MT CO2e/ per MT carbon steel).	100.00%	
Fuel-and-energy-related activities (not included in Scope 1 or 2)	Relevant, calculated	2173000	The methodology used is based on the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard, Category 3. For electricity, we prorated the fuel mix ratios in those 7 countries where we use more than 1 billion KW. These 7 countries represent more than 87% of our total electricity usage. We extrapolated this mix to the remaining 13% of our electricity usage. We then assumed a T&D loss rate of 7%, based on information from the U.S. Department of Energy. We then added in emissions from upstream natural gas.	100.00%	

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
Upstream transportation and distribution	Not relevant, explanation provided				In 2013, two transportation projects were evaluated: one very large project in Russia and one medium-sized project in the U.S. For each project, distance travelled was recorded for road, rail and sea. Emissions factors per mode of transportation were used from CEFIC/ECTA March 2011 Guidelines for Measuring and Managing CO2 Emissions from Freight Transport Operations, and GHG emissions were determined per project. The average GHG emissions per project were multiplied by the number of oversized and heavy capital equipment transportation projects. This was multiplied by 1.2 to determine GHG emissions from 100 percent of capital equipment purchased. The number likely overstates the emissions as 20 percent is from far smaller capital equipment transportation projects. These emissions represented less than 2% of our Scope 3 footprint in both 2013 and 2014. Therefore, we did not calculate these emissions for 2015 and deem them not relevant.
Waste generated in operations	Relevant, calculated	17000	The methodology used is based on the Greenhouse Gas Protocol's Corporate Value Chain (Scope 3) Accounting and Reporting Standard. Using the average data method according to this standard, Praxair uses waste volumes provided by waste vendors and multiplies the waste treated by third parties for each waste treatment method by the associated emission factors. The amount of waste treated by third parties is recorded in our EKPI database according to the waste treatment methods (landfill, recycled, other). To calculate the CO2e emissions resulting from waste treated in landfills, Praxair multiplies the total amount of waste in this category by an emissions factor provided by the EPA, which is associated with the municipal waste mix in the United States. The IPCC suggests that any CO2e emissions associated with recycling should not be included in Scope 3 inventories. Therefore, Praxair uses an emissions factor of 0 for recycled waste treated by third parties. The small amount of waste which is not landfilled or recycled is calculated equally as if it were landfilled.	100.00%	Emissions from waste generated in operations is relevant to Praxair. We have a Zero Waste program that encourages all sites to reduce waste and eliminate sending waste to landfill. Participation in this program is growing and through this program, we track waste data and the GHG benefits from reducing waste.

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
Business travel	Not relevant, explanation provided				Praxair estimated emissions from business travel in 2012 and 2013. These emissions were about 9,000 metric tons CO2e, representing 0.3% of our Scope 3 footprint. Since our level of business travel did not change in 2014 or 2015 compared to 2013, we did not recalculate these emissions. We do not consider these emissions to be relevant to our Scope 3 footprint.
Employee commuting	Not relevant, explanation provided				Praxair calculated GHG emissions from employee commuting for 2012 through 2014. In each year, emissions totaled about 2% of total Scope 3 emissions. As emissions from employee commuting are not relevant to our Scope 3 footprint, we did not calculate these emissions for 2015.
Upstream leased assets	Not relevant, explanation provided				Praxair estimated emissions from leased office space in 2012 and 2013. These emissions were about 15,000 metric tons CO2e in 2013, representing 0.5% of our Scope 3 footprint. Since the square footage of leased office space did not change significantly in 2014 or 2015 compared to 2013, we did not recalculate these emissions. We do not consider these emissions to be relevant to our Scope 3 footprint.
Downstream transportation and distribution	Relevant, calculated	260000	Praxair products are delivered by pipeline, through on-site product production, and by truck. A small portion is delivered by train and ship. Product delivered by Praxair trucks is reported as Scope 1. About half of Praxair's truck miles each year are driven by contractors. Contractor miles driven are collected in each country and business or region and tracked as part of Praxair's safety program. Praxair's Scope 3 emissions resulting from delivery of products by third-party carriers were derived by assuming contractor fuel efficiency is equivalent to the prior year Praxair driving fuel efficiency. This miles per gallon value was then multiplied by total miles driven and converted to GHGs using an EPA emission factor for diesel fuel.	100.00%	

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
Processing of sold products	Not relevant, explanation provided				<p>Guidance for this category is based on the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard, section 6.4. Praxair is at the beginning of many value chains (for carbonated beverage companies, refineries, electronics, aerospace, automotive, healthcare, steel making, etc.). Praxair provides many intermediate products with many downstream applications, each of which has a very different GHG profile. The effort involved in determining Scope 3 emissions from processing of our products is not reasonable, and for this reason, we are unable to reasonably estimate the downstream emissions associated with the various end uses of our products. For these reasons we do not report emissions in the following categories: processing of sold products, use of sold products, and end of life treatment of sold products.</p> <p>Emissions from our CO2 sales to the food industry may be traceable. This market segment is a subset of our food and beverage end market, which is 9% of our annual revenue. Actual CO2 volumes are business confidential. However, customers have requested this information as part of CDP's Supply Chain program and we have provided it to them.</p>

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
Use of sold products	Not relevant, explanation provided				<p>Guidance for this category is based on the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard, section 6.4. Praxair is at the beginning of many value chains (for carbonated beverage companies, refineries, electronics, aerospace, automotive, healthcare, steel making, etc.). Praxair provides many intermediate products with many downstream applications, each of which has a very different GHG profile. The effort involved in determining Scope 3 emissions from use of our products is not reasonable, and for this reason, we are unable to reasonably estimate the downstream emissions associated with the various end uses of our products. For these reasons we do not report emissions in the following categories: processing of sold products, use of sold products, and end of life treatment of sold products.</p> <p>As noted in CC3.2a, the use of a number of our products/applications helps customers reduce their GHG emissions, i.e., the use of our products does not generate emissions but helps others reduce theirs.</p> <p>Emissions from our CO2 sales to the food industry may be traceable. This market segment is a subset of our food and beverage end market, which is 9% of our annual revenue. Actual CO2 volumes are business confidential. However, customers have requested this information as part of CDP's Supply Chain program and we have provided it to them.</p>

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
End of life treatment of sold products	Not relevant, explanation provided				<p>Guidance for this category is based on the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard, section 6.4. 47% of Praxair's raw materials are non-greenhouse gas atmospheric gases, extracted directly from the air and ultimately returned to the atmosphere with no GHG impact. In addition, Praxair is at the beginning of many value chains (for carbonated beverage companies, refineries, electronics, aerospace, automotive, healthcare, steel making, etc.). Praxair provides many intermediate products with many downstream applications, each of which has a very different GHG profile. The effort involved in determining Scope 3 emissions from end-of-life treatment of our products is not reasonable, and for this reason, we are unable to reasonably estimate the downstream emissions associated with the various end uses of our products. For these reasons we do not report emissions in the following categories: processing of sold products, use of sold products, and end of life treatment of sold products.</p> <p>Emissions from our CO2 sales to the food industry may be traceable. This market segment is a subset of our food and beverage end market, which is 9% of our annual revenue. Actual CO2 volumes are business confidential. However, customers have requested this information as part of CDP's Supply Chain program and we have provided it to them.</p>
Downstream leased assets	Not relevant, explanation provided				Praxair does not have any downstream leased assets.
Franchises	Not relevant, explanation provided				Praxair does not have any franchises.
Investments	Not relevant, explanation provided				An estimate of Praxair's share of GHG emissions from joint ventures where we own less than 50% was made for 2012 and 2013 based on assuming the same output per \$ revenue in our JV's as in our own business. In 2014 and 2015, we owned only a small share in a joint venture, and our share of revenue in JV's is only a fraction of our total revenue. We estimated emissions from JV's to be less than 1% of our Scope 3 footprint and, therefore, consider them not relevant.

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
Other (upstream)					
Other (downstream)					

CC14.2 Please indicate the verification/assurance status that applies to your reported Scope 3 emissions

Third party verification or assurance process in place

CC14.2a Please provide further details of the verification/assurance undertaken, and attach the relevant statements

Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/Section reference	Relevant standard	Proportion of reported Scope 3 emissions verified (%)
Annual process	Complete	Moderate assurance	AA1000AS Assurance Statement – 2016.pdf	Page 1&2 - audit cycle, scope of audit, reporting year, type of assurance, assurance standard used; page 3 - findings; page 5 - audited KPI values, proportion of reported emissions verified	AA1000AS	9

CC14.3 Are you able to compare your Scope 3 emissions for the reporting year with those for the previous year for any sources?

Yes

CC14.3a Please identify the reasons for any change in your Scope 3 emissions and for each of them specify how your emissions compare to the previous year

Sources of Scope 3 emissions	Reason for change	Emissions value (percentage)	Direction of change	Comment
Capital goods	Change in output	24	Increase	Praxair purchased more steel in 2015 than in 2014, for the purposes of building new plants. Very little construction occurred in 2014 compared to 2015, when several large new facilities were built. $[(505,000-406,000)/406,000*100 = 24\%]$
Fuel- and energy-related activities (not included in Scopes 1 or 2)	Change in output	6	Increase	Gross Scope 1+2 emissions from Praxair's use of electricity and natural gas increased by about 6%, leading to a corresponding 6% increase in Scope 3 emissions from the same activities. While worldwide output decreased, the increase in GHG emissions is due primarily to an increase in production in areas with high GHG emission factors. $[(2,173,000-2,050,000)/2,050,000*100 = 6\%]$
Waste generated in operations	Change in output	31	Increase	Emissions in this category increased from 13,000 MT in 2014 to 17,000 MT in 2015 (difference of 4,000 MT). The amount of waste that Praxair landfills decreased over the same period, from 10,000 MT to 9,000 MT. However, the amount of waste that is not landfilled or recycled increased substantially due to production changes at various locations around the world. This means that even though Praxair's total waste in 2015 was less than in 2014, Scope 3 GHG emissions increased because of the type of waste generated. $(4,000/13,000*100 = 31\%)$
Downstream transportation and distribution	Change in output	4	Increase	Worldwide output decreased in 2015 from 2014. However, increases in production occurred outside the U.S., where the majority of miles driven to transport product is done by contract drivers. $[(260,000-250,000)/250,000 *100 = 4\%]$

CC14.4 Do you engage with any of the elements of your value chain on GHG emissions and climate change strategies? (Tick all that apply)

Yes, our suppliers

CC14.4a Please give details of methods of engagement, your strategy for prioritizing engagement and measures of success

We engage with utility suppliers (where we work together to reduce emissions from our electricity use) and with contract drivers (where we work together to reduce their emissions from distributing our product). These are two of the largest components of our supply chain, and the two areas where engagement has the greatest impact on managing GHG emissions.

Method of engagement: As a very large energy buyer, Praxair is a strategic customer for many of its electricity providers. Praxair energy reductions can help utility companies meet state and federal/ national regulations for energy efficiency and renewable energy standards. Also, Praxair's flexible use of power allows the utility companies to effectively manage their loads and not have to build out a capital infrastructure to manage intermittent peaks in demand. Praxair therefore reaches out to these suppliers on a regular planned basis and partners with utility companies one-on-one to optimize these win-win opportunities.

We engage contract drivers by communicating Praxair's supplier expectations and partnering on initiatives to improve fuel efficiency. We also include contract drivers in certain regions in our GHG efficiency targets.

Prioritizing engagements: Praxair prioritizes engagement with the 25 major utility companies in the U.S. where we have major contracts that collectively account for almost 1/3 of Praxair's global power consumption and more than 90% of Praxair's U.S. power spend, or over \$400 million. As energy is the largest component of Praxair's variable costs, energy efficiency is a material issue for the company. Optimizing energy use is a key strategy to minimize risks from increases in energy prices, as well as to increase margin and revenue.

We focus our engagement with contract drivers in Europe and South America, where a higher percentage of drivers are contract drivers (as opposed to Praxair employees).

Measure of success: The results of our engagement are measured in several ways, including, for example, an annual report on energy and CO2e savings resulting from partnerships with utility company suppliers. In 2015, these partnerships saved more than 15,000 MT CO2e and more than \$1 million from energy efficiency, i.e., reduced energy demand. The projects realized an additional \$2 million in incremental revenue from customer rebates that were incentives to Praxair's investments in capital improvements.

We also measure miles driven by contract drivers. In South America, where 97% of miles driven in 2015 were by contract drivers, Praxair has a target to improve GHG efficiency from contract driving by 1.5% per year, in line with the target for Praxair drivers in bulk and packaged gas. In 2015, contract drivers in South America improved GHG efficiency by 2.2%. They also reduced absolute GHG emissions by 6.9% over the same time period.

One example of our success with a utility partnership: Praxair procures most of its energy from major utilities and many of these relationships offer opportunities to save energy and address climate change. One example is the Los Angeles Department of Water and Power (LADWP), for which Praxair is a major customer. Praxair is an active participant in LADWP's Sustainability Partnership Program and is engaged in a range of energy conservation measures at its facilities in Wilmington, California. These included re-wheeling an existing large air compressor, reconfiguring product and air compression equipment, and improving crossties between pre-purifier molecular sieve beds, among other measures. Together these improvements resulted in annual energy savings of over 5 million kilowatt hours per year - equivalent to the amount of electricity used by more than 500 U.S. homes a year - and thereby reducing 3,500 MT of carbon dioxide equivalent (CO2e) per year. These energy conservation actions, combined with the incentive received from LADWP, contributed more than half a million dollars in savings. This partnership illustrates Praxair's commitment to conservation, is helping LADWP meet its "energy efficiency goal of 15% by year 2020 - the highest and most ambitious energy efficiency goal by a major municipal utility in the United States", and further contributes to California's aggressive greenhouse gases reduction goals, including achieving 2009 emissions levels by 2020 and a 40% further reduction by 2030.

CC14.4b To give a sense of scale of this engagement, please give the number of suppliers with whom you are engaging and the proportion of your total spend that they represent

Number of suppliers	% of total spend (direct and indirect)	Comment
25	30%	Praxair has major contracts with at least 25 major U.S. utility company suppliers that collectively account for almost 1/3 of Praxair's global power consumption and more than 90% of Praxair's U.S. power spend, or over \$400 million.

CC14.4c If you have data on your suppliers' GHG emissions and climate change strategies, please explain how you make use of that data

How you make use of the data	Please give details
Identifying GHG sources to prioritize for reduction actions	We have prioritized GHG emissions from driving for reduction activities. Drivers drive Praxair product around the world about 30Xs a day, and half of this is done by contract drivers. We track and manage GHG emissions in trucking for both Praxair drivers and contract drivers, to help us improve distribution efficiency around the world. We invest in technology such as route optimization and on-board computers (OBCs), and in training in fuel-efficient driving techniques. Praxair began a pilot program in Germany, installing OBCs in all contract carrier trucks. These contract carriers reported a 75% reduction in driving-related critical safety events and a 3-5 percent average reduction in fuel consumption. Due to the success of this program, OBCs are now being installed in contract carrier fleets across Europe.

How you make use of the data

Please give details

In addition, suppliers are annually engaged in a series of steps starting with the communication of Praxair’s supplier expectations, including environmental improvement. Expectations that contractor environmental performance is in line with Praxair standards has been included among several sustainability issues that are “tie-breakers” in proposals; and they have been included in contract terms.

Beginning in 2014, we began evaluating the data from our contract carriers to identify any gaps and determine whether it would be feasible to extend our 1.5% per year target for improving driving GHG intensity to our worldwide contract drivers. In 2015, we determined that we are not able to set a worldwide target for contract drivers, but we did set a target in South America to improve GHG intensity from contract driving 1.5% per year. As noted above, we continue to track emissions and work with contract drivers in all regions to help them reduce GHG emissions.

Further Information

Module: Sign Off

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CC15.1

Please provide the following information for the person that has signed off (approved) your CDP climate change response

Name	Job title	Corresponding job category
Anne K. Roby	Senior Vice President, Office of the Chairman	Chief Operating Officer (COO)

Further Information

CDP