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# GLOBAL 500 GREENHOUSE GASES PERFORMANCE 2010-2013: 2014 REPORT ON TRENDS

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**INTRODUCTION**

With government representatives having just gathered in Lima, Peru, to discuss cuts in their greenhouse gas (GHG) emissions, the timing is ripe to discuss the role of the world’s business sector in likewise reducing emissions. Are the world’s 500 largest businesses (Global 500) reducing their GHG emissions at a rate consistent with the global scientific consensus on the risks of climate change?

As discussed in this report, the Global 500 are directly and indirectly (through the energy they use) responsible for more than 10 percent of worldwide GHG emissions. “Responsibility” in this context is a complex concept. Nearly all of us regularly use the products from the largest emitters of GHG. We are all a part of a stakeholder network that shares in the benefits provided by modern industry, but also in the responsibility for managing the impact of that industry on our planet, and the planet that subsequent generations will inhabit.

Therefore, an important part of reducing this impact is stakeholder engagement. With integrated corporate responsibility outreach programs, businesses are able to engage increasingly in partnerships with their stakeholders – be they customers, suppliers, employees,

investors, local communities, governments or NGOs – to find collective solutions to the challenge that climate change poses. And relevant stakeholders vary by industry.

For some industries with relatively large footprints, such as utilities, mining, cement production and steelmaking, GHG emissions come from running their core businesses, and efforts to reduce emissions will focus on stakeholder engagement in their operations to drive efficiency and reduction. Other businesses with smaller operational footprints, such as banking, telecommunications and retail, can also have profound emissions impact by requiring measurement and reductions across their value or supply chains.

Some industries can do both. The energy industry in particular can do so by acting internally to reduce operational GHG emissions created through the extraction of coal, oil and gas (about 20 percent of the energy industry total footprint), and also through its stakeholder networks, driving innovation and efficiency to reduce the emissions created when energy is produced and consumed. This sector is a particularly important part of the solution, as altogether it composes 37 percent of total GHG emissions for the Global 500.

Achieving these reductions requires information across these stakeholder groups. The tried and tested adage of “you can’t manage what you can’t measure” applies here too. We hope that this report provides you with some further, actionable information on the Global 500 GHG emissions, whether you are an employee, customer, supplier, investor, NGO, reporter, government or member of a local community.

*The Global 500 are directly and indirectly (through the energy they use) responsible for more than 10 percent of worldwide GHG emissions.*

## EXECUTIVE SUMMARY

### Importance of Global 500

This report provides information about how the greenhouse gas (GHG) emissions from the world's 500 largest companies by capitalization (Global 500) have evolved from 2010 (the baseline year for calculating GHG emission reductions) to 2013 (the latest year with complete data). The Global 500 are important, as their revenues correspond to 28 percent of global GDP and their aggregated GHG emissions produced directly (scope 1) and indirectly (scope 2) equate to an estimated 13.8 percent of GHG emitted in 2013 (worldwide CO<sub>2</sub> from fossil fuels and cement manufacture). Scope 3 (value/supply chain) is not considered by this first report mainly due to lack of data but could be included in future reports, especially for less carbon-intensive industries with influence over significant emissions in their supply or value chains.

### Trends

- The Global 500's GHG have increased by 3.1 percent from 2010 to 2013 to reach 4.96 gigatonnes per year of CO<sub>2</sub> equivalents that correspond to 13.8 percent of global emissions.
- GHG should have decreased by 4.2 percent for the same period in order to have a likely probability of staying within the 2° Celsius average global temperature increase outlined in the 2014 UNEP Emissions Gap Report.
- Therefore, there remains a significant gap of 7.3 percent of 2010 emissions between how GHG are growing versus how they should have decreased.
- GHGs are concentrated, with the Top 50 emitters accounting for 79 percent of total Global 500 emissions.

### GHG Accounting and Transparency

The level of accuracy, methodology, scope and methods for how GHG are measured and reported (either self-reported or estimated by Thomson Reuters Asset4 where no reported values exist) can vary from business to business. However, looking at emissions over a four-year period and for such a large group of businesses can reduce the overall level of error and can give a reasonable actionable level of information on how business GHG emissions are evolving. Global 500 internal and external stakeholders can use the information provided to engage and dialogue better with Global 500 management on how they will perform in terms of reducing GHG emissions.

### GHG Performance Examples

Companies such as Arcelor Mittal, Dominion Resources, GDF Suez, Holcim, Lafarge, NTPC, Petrochina, Total and Vale are used as examples of companies that have significantly reduced or increased GHG through growth, acquisition, merger, decarbonisation, energy efficiency and business diversification. These companies are included in the report to illustrate that GHG increases or decreases are a result of a complex set of stakeholder-related variables to which individual companies are exposed. Evaluation of "performance" in light of GHG reduction targets must be done in the context of individual company circumstances, while at the same time recognizing the critical corporate and collective responsibility for aggregate reduction.

## APPROACH AND METHODS USED

The Global 500 are the 500 largest companies in the world in terms of capitalization. The Global 500 used for this report are as defined by Carbon Disclosure Project (CDP) for its 2013 report. The Global 500 represent 28 percent of world GDP on a revenues basis, which is comparable to the U.S. and Japanese economies combined. As the main criterion for inclusion of a company in the Global 500 is capitalization, the least to the most carbon-intensive businesses and industries are represented. GHG emissions reporting is done voluntarily by approximately 350 of the Global 500, in most cases reporting GHG emissions directly to the CDP. For businesses that did not disclose GHG emissions, estimates from Thomson Reuters Asset4 were used. From the Global 500, only Prada had no GHG emissions either reported on or estimated by Thomson Reuters Asset4 for all years reviewed by this report (2010-2013).

The Thomson Reuters Asset4 database was the source for reported and estimated emissions for the Global 500 from 2010 to 2013. Absolute GHG emissions are reported as CO<sub>2</sub> Equivalent Tonnes for Scope 1 (emissions from operations) and Scope 2 (emissions from energy consumed by operations). Scope 3 (emissions from value or supply chain) was not considered due to lack of data and double counting, but could be in future reports. For nonreporting companies, Thomson Reuters Asset4 estimates were used using Asset4 Median, Energy or CO<sub>2</sub> methodologies.

Changes in absolute emissions may be the result of business growth and/or the result of concerted action to become less carbon intensive. Change in absolute emissions also can be the result of acquiring or selling part of a business, or reflect changes in GHG scope or methodology for measuring GHG. There are therefore potentially big differences in how GHG emissions are reported, and the quality and precision of the values reported may vary significantly from one business to the next and from one year to the next. However, this report, with its focus on trends, reduces the chance for error by focusing on absolute emissions evolution over a four-year period. From a climate change perspective, it is the level and change in absolute emissions that have an impact on world climate.

Despite some of the shortcomings mentioned above, a picture of GHG emissions by the Global 500 does emerge and is a good starting point to enable more stakeholder engagement and further transparency through dialogue. This in turn enables Global 500 stakeholders to make more-informed decisions, including decisions regarding acquisitions, divestment and investment in the Global 500.

### 2010 was chosen as the baseline year for this report on 2010-2013 emissions for a number of reasons:

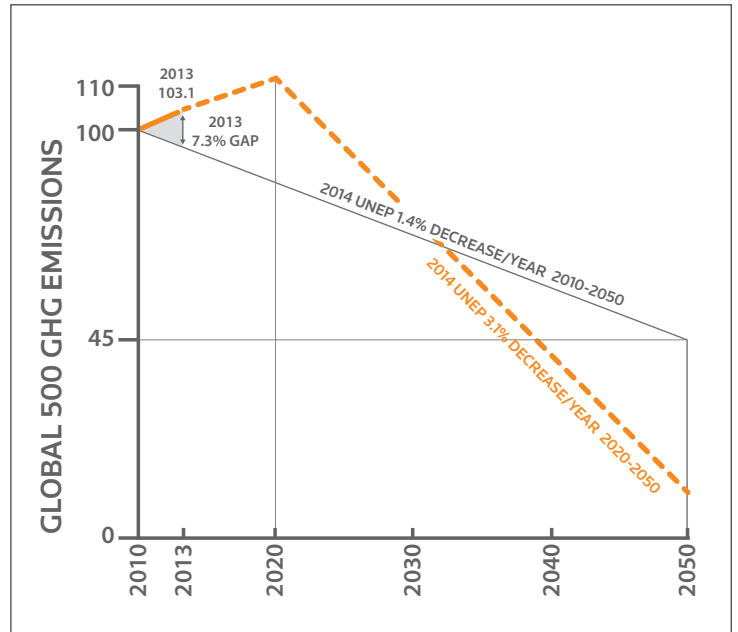
- 1990 (the baseline year for Kyoto Protocol) is too distant, and 2005 (the baseline year used more recently) preceded the financial crisis and therefore "locks in" the subsequent reductions in GHG due to the economic slowdown
- Recent work to calculate remaining CO<sub>2</sub> budget and required emissions reductions needed to stay within a 2° C increase for the 2010-2050 time period by, amongst others, Carbon Tracker, IEA, IPCC, OECD, Potsdam Institute and UNEP
- Good Global 500 data availability for the 2010 to 2013 time period

**ANALYSIS OF GLOBAL 500 GHG EMISSIONS**

The world's 500 largest businesses collectively emitted 4.96 gigatonnes of CO<sub>2</sub> equivalents in 2013, based on reported and estimated emissions. This represents more than the entire European Union's 2010 GHG emissions of 4.66 Gt CO<sub>2</sub>e, and is equivalent to 13.8 percent of worldwide CO<sub>2</sub> emissions of 36 GtCO<sub>2</sub> in 2013.

GHG emissions increased by 3.1 percent from 2010 to 2013, which corresponds to an average annual increase of 1 percent. This differs from the 1.2 to 1.7 percent average annual decrease required to have a likely chance of staying within a 2° C average increase in global temperature between 2010 and 2050, as most recently confirmed by the 2014 UNEP Emissions Gap Report. In other words, the world's largest businesses' aggregated emissions increased when they should have decreased, with a consequent "gap" of 7.3 percent of 2010 emissions over the period from 2010 to 2013 (See figure right).

The Top 20 emitters of the Global 500 produced a combined 2.77 GtCO<sub>2</sub>e, accounting for 56 percent of Global 500 GHG emissions in 2013, more than India's (2.43 GtCO<sub>2</sub>e) or Russia's (2.29 GtCO<sub>2</sub>e) 2010 GHG emissions (see Appendix 1 for the list of Top 20 emitters). The Top 50 companies accounted for 79 percent of Global 500 emissions, which corresponds to 3.90 GtCO<sub>2</sub>e or about three times Japan's emissions or four times Germany's emissions.



## GLOBAL 500 GHG EMISSIONS FOOTPRINT

The emissions profile of the Global 500 varies significantly from one business to the next. Of the Global 500 with an annual GHG footprint of over 10 million tonnes (10 million metric tonnes of CO<sub>2</sub> is the annual equivalent output of 2,100,500 passenger vehicles): 21 businesses showed decreases in GHG emissions of more than 10 percent in 2013 versus 2010 (Appendix 2); conversely, 22 businesses with a GHG footprint of over 10 million tonnes had emissions that increased by more than 10 percent for the same time period (Appendix 3). Following are different examples of footprints for the 2010-2013 time period, which are not meant to call out good or bad performance per se, but rather to illustrate some of the contextual drivers for emissions within specific stakeholder networks.

### Footprint Examples:

**Decreasing Emissions: Total** is an integrated oil and gas business that managed to decrease Scope 1 and 2 GHG emissions by 11.8 percent over 2010, due to a combination of reduced gas flaring and less carbon from energy procured for its operations, according to Total's sustainability report. The group overall energy efficiency did, however, worsen in 2013 from 2012 by 2.3 percent.

**Increasing Emissions: Arcelor Mittal**, the world's largest steel manufacturer, saw a 12 percent increase in its GHG emissions, to 209 million tonnes in 2013. The carbon intensity of its steel increased from 2.09 tonnes GHG (2011) to 2.14 tonnes GHG (2013) per tonne of steel produced.

**Reducing emissions by decreasing carbon intensity and less electricity production: Dominion Resources** is a power and energy business which has reduced emitted GHG by 37.9 percent. According to Dominion Resources' reports, from 2010 to 2013:

- Carbon intensity decreased by 22.2 percent (1,027 to 799 lb CO<sub>2</sub>e/net megawatt). Coal went from more than 40 percent of the company's energy mix in 2010 to 26 percent in 2013.
- Energy production went from 27,600 megawatts to 23,600 megawatts generation, a decrease of 8.5 percent.

**Reduction through divestment: Vale**, a leader in iron ore and nickel mining, decreased its emissions by 23 percent largely due to the sale of its aluminium operations and the closure of its Carajas Pig Iron ore unit in 2011, and the interruptions, shutdowns and sale of part of its infrastructure in 2013 (6 percent reduction for Scope 1), as reported by Vale.

**Increase through acquisition: GDF Suez** acquired International Power in 2011 and its GHG emissions went from 112.6 million tonnes in 2010 to 160.3 million tonnes in 2011, a 42.4 percent increase. This could largely explain the 36.2 percent increase in emissions for the entire time period of the report, 2010 to 2013, although emissions for the last three years of the report actually decreased by 4.3 percent. Nevertheless, those additional tonnes are now produced and owned by GDF Suez, in terms of risk management, cost and environmental impact.

**Increase through merger: Lafarge and Holcim**, respectively number 1 and 2 cement manufacturers and both members of the Global 500, plan to merge in 2015. Lafarge's emissions decreased by 11.6 percent and Holcim's increased by 0.6 percent. The combined 2013 emissions of the two entities was 194.6 million tonnes in 2013, which would have made it fifth highest (compared to 14th for Holcim and 16th for Lafarge, currently) of the Global 500.



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### Biggest and most carbon-intensive emitters:

**Petrochina's GHG** emissions for 2013 were estimated by Thomson Reuters Asset4, using its Median methodology, at 310.5 million tonnes, which made Petrochina, the largest oil and gas producer and distributor in China, the biggest GHG emitter of the Global 500 (comparable to the 2010 emissions of Pakistan). Its GHG emissions increased by 3.7 percent over 2010.

**NTPC**, India's largest power producer, emitted 201 million tonnes CO<sub>2</sub>e in 2013 (an increase of 8.3 percent over 2010). NTPC is the most carbon-intensive of the Global 500. This is due to coal accounting for 88.9 percent of NTPC-owned plants' power generation.

**CONCLUSIONS**

- The Global 500 are a significant source of GHG emissions (13.8 percent of Global 2013 CO<sub>2</sub> emissions) and are important to follow in terms of GHG trends, as they represent 28 percent of Global GDP on a total revenue basis.
- Although the Global 500 GHG growth rate was on average 1 percent, this is considerably above the required annual average decrease of 1.4 percent that is needed to stay within a 2° C increase in global average temperature from 2010 to 2050.
- GHG emissions are unevenly distributed with a significant concentration in the Top 20 (56 percent of Global 500 emissions) and Top 50 (79 percent).
- The Global 500 have shown big differences in emission trends given the significant variation in their individual increase/decrease rates seen in GHG emissions from 2010 to 2013.
- As illustrated by the example footprints, GHG under Global 500 responsibility (that they produce directly and indirectly) can be strongly influenced by using different strategies and stakeholder engagement (carbon intensity reduction, energy efficiency, green business growth, carbon-intensive business divestment, greener energy procurement, supply chain targets, etc.).
- Some businesses have managed to significantly decrease their GHG emissions in line with – and even exceeding – required decrease rates to stay within a 2° C increase.
- To help reduce the impact on the climate, businesses and their stakeholders will need to focus more on the absolute tonnes of GHG and their emissions trend over time versus other benchmarks (e.g., “carbon intensity” or carbon per amount of revenue produced). In the end, it is total emissions which are having an impact on our present and future climate.
- Increasing awareness about how the Global 500 contribute to GHG emissions should enable more transparency; better understanding of materiality of GHG for individual companies; and greater engagement and dialogue by their management, investors and stakeholders on how to reduce them.

**GLOBAL 500 REPORT SERIES**

This is the first report in a series that focussed on overall trends. Additional reports will be published that will focus on specific industries and how industries and their stakeholders can reduce GHG emissions and close the gap between current GHG growth rates and required cuts in GHG. For less carbon-intensive industries (financial sector, software, retail, etc.), we will focus on how companies can influence GHG within and beyond (scope 3) their company boundaries.

**Appendix 1: Top 20 Emitters – 2013**

| Company Name                              | Country     | GCIS Sector | GCIS Sub-Industry                           | Estimated total Scope 1+Scope 2 CO <sub>2</sub> and CO <sub>2</sub> equivalents emission in tonnes. | 2013 versus 2010 Baseline 100 | CO <sub>2</sub> estimate method |
|---|-------------|-------------|---|---|-------------------------------|---------------------------------|
| PETROCHINA Company Limited                | China       | Energy      | Integrated Oil & Gas                        | 310,518,999   | 104                           | Median                          |
| China Petroleum & Chemical Corporation    | China       | Energy      | Integrated Oil & Gas                        | 249,454,634   | 98                            | Median                          |
| Arcelor Mittal                            | Luxemburg   | Materials   | Steel                                       | 207,000,000   | 112                           | Reported                        |
| NTPC Ltd                                  | India       | Utilities   | Independent Power Producers & Energy Trader | 200,994,691   | 108                           | Reported                        |
| RWE AG                                    | Germany     | Utilities   | Multi-Utilities                             | 167,200,000   | 98                            | Reported                        |
| GDF Suez                                  | France      | Utilities   | Multi-Utilities                             | 153,338,806   | 136                           | CO <sub>2</sub>                 |
| Duke Energy Corporation                   | USA         | Utilities   | Electric Utilities                          | 136,115,000   | 85                            | Reported                        |
| Gazprom OAO                               | Russia      | Energy      | Integrated Oil & Gas                        | 131,895,468   | 96                            | CO <sub>2</sub>                 |
| Exxon Mobil Corporation                   | USA         | Energy      | Integrated Oil & Gas                        | 126,000,000   | 86                            | Reported                        |
| E.ON SE                                   | Germany     | Utilities   | Multi-Utilities                             | 120,700,000   | 91                            | Reported                        |
| ENEL SpA                                  | Italy       | Utilities   | Electric Utilities                          | 115,690,000   | 99                            | Reported                        |
| American Electric Power Company, Inc.     | USA         | Utilities   | Electric Utilities                          | 115,000,000   | 83                            | Reported                        |
| Nippon Steel & Sumitomo Metal Corporation | Japan       | Materials   | Steel                                       | 114,071,904   | 189                           | CO <sub>2</sub>                 |
| Holcim Ltd                                | Switzerland | Materials   | Construction Materials                      | 102,100,000   | 101                           | Reported                        |
| The Southern Company                      | USA         | Utilities   | Electric Utilities                          | 102,000,000   | 77                            | Reported                        |
| Lafarge S.A.                              | France      | Materials   | Construction Materials                      | 92,500,000  | 88                            | Reported                        |
| POSCO                                     | South Korea | Materials   | Steel                                       | 88,138,000  | 123                           | Reported                        |
| Royal Dutch Shell                         | Netherlands | Energy      | Integrated Oil & Gas                        | 83,000,000  | 98                            | Reported                        |
| EDF                                       | France      | Utilities   | Electric Utilities                          | 80,600,000  | 99                            | Reported                        |
| Petróleo Brasileiro SA - Petrobras        | Brazil      | Energy      | Integrated Oil & Gas                        | 73,400,000  | 120                           | Reported                        |
| <b>TOTAL TOP 20</b>                       |             |             |   | <b>2,769,717,502</b>  | <b>101</b>                    |                                 |

For more information on the patented, Asset4 estimating models, please contact the authors.

## Appendix 2: Businesses with 2013 GHG Footprint of > 10 Million Tonnes and a Decrease of > 10 Percent over 2010

| Company Name                          | Country        | GCIS Sector | GCIS Sub-Industry                  | Estimated total   | Index | CO <sub>2</sub> estimate method |
|---------------------------------------|----------------|-------------|------------------------------------|---|-------|---------------------------------|
|                                       |                |             |                                    | Scope 1+Scope 2 CO <sub>2</sub> and CO <sub>2</sub> equivalents emission in tonnes. |       |                                 |
| ConocoPhillips                        | USA            | Energy      | Oil & Gas Exploration & Production | 27,386,416  | 40    | Reported                        |
| Valero Energy Corporation             | USA            | Energy      | Oil & Gas Refining & Marketing     | 18,747,879  | 58    | CO <sub>2</sub>                 |
| Dominion Resources, Inc.              | USA            | Utilities   | Multi-Utilities                    | 35,463,532  | 62    | CO <sub>2</sub>                 |
| BP                                    | United Kingdom | Energy      | Integrated Oil & Gas               | 55,800,000  | 74    | Reported                        |
| Vale                                  | Brazil         | Materials   | Steel                              | 15,400,000  | 77    | Reported                        |
| The Southern Company                  | USA            | Utilities   | Electric Utilities                 | 102,000,000   | 77    | Reported                        |
| Iberdrola SA                          | Spain          | Utilities   | Electric Utilities                 | 36,019,292  | 79    | Reported                        |
| LyondellBasell Industries Cl A        | Netherlands    | Materials   | Commodity Chemicals                | 19,000,000  | 79    | Reported                        |
| Eni SpA                               | Italy          | Energy      | Integrated Oil & Gas               | 48,055,680  | 81    | Reported                        |
| CEZ                                   | Czech Republic | Utilities   | Electric Utilities                 | 31,764,986  | 82    | CO <sub>2</sub>                 |
| American Electric Power Company, Inc. | USA            | Utilities   | Electric Utilities                 | 115,000,000   | 83    | Reported                        |
| Rio Tinto                             | United Kingdom | Materials   | Diversified Metals & Mining        | 37,800,000  | 85    | Reported                        |
| Anglo American                        | United Kingdom | Materials   | Diversified Metals & Mining        | 17,010,000  | 85    | Reported                        |
| Duke Energy Corporation               | USA            | Utilities   | Electric Utilities                 | 136,115,000   | 85    | Reported                        |
| Chevron Corporation                   | USA            | Energy      | Integrated Oil & Gas               | 57,000,000  | 86    | Reported                        |
| Exxon Mobil Corporation               | USA            | Energy      | Integrated Oil & Gas               | 126,000,000   | 86    | Reported                        |
| NextEra Energy, Inc.                  | USA            | Utilities   | Electric Utilities                 | 44,947,871  | 87    | Reported                        |
| Total                                 | France         | Energy      | Integrated Oil & Gas               | 50,300,000  | 88    | Reported                        |
| Lafarge S.A.                          | France         | Materials   | Construction Materials             | 92,500,000  | 88    | Reported                        |
| BASF SE                               | Germany        | Materials   | Diversified Chemicals              | 22,829,000  | 89    | Reported                        |
| Saint-Gobain                          | France         | Industrials | Building Products                  | 16,700,000  | 89    | Reported                        |

## Appendix 3: Businesses with 2013 GHG Footprint of > 10 Million Tonnes and an Increase of > 10 Percent over 2010

| Company Name                              | Country        | GCIS Sector | GCIS Sub-Industry                  | Estimated total   | Index | CO <sub>2</sub> estimate method |
|---|----------------|-------------|------------------------------------|---|-------|---------------------------------|
|   |                |             |                                    | Scope 1+Scope 2 CO <sub>2</sub> and CO <sub>2</sub> equivalents emission in tonnes. |       |                                 |
| Glencore Xstrata plc                      | Switzerland    | Materials   | Diversified Metals & Mining        | 39,148,000  | 349   | Reported                        |
| Surgutneftegas                            | Russia         | Energy      | Integrated Oil & Gas               | 57,672,160  | 292   | Median                          |
| Exelon Corporation                        | USA            | Utilities   | Electric Utilities                 | 24,967,000  | 262   | Reported                        |
| Nippon Steel & Sumitomo Metal Corporation | Japan          | Materials   | Steel                              | 114,071,904   | 189   | CO <sub>2</sub>                 |
| Rosneft                                   | Russia         | Energy      | Integrated Oil & Gas               | 61,908,943  | 164   | CO <sub>2</sub>                 |
| Canadian Natural Resources Limited        | Canada         | Energy      | Oil & Gas Exploration & Production | 29,354,000  | 161   | Reported                        |
| Husky Energy Inc.                         | Canada         | Energy      | Integrated Oil & Gas               | 13,930,000  | 160   | Reported                        |
| PTT                                       | Thailand       | Energy      | Integrated Oil & Gas               | 34,178,977  | 144   | Reported                        |
| National Grid                             | United Kingdom | Utilities   | Multi-Utilities                    | 12,461,908  | 141   | Reported                        |
| Linde AG                                  | Germany        | Materials   | Industrial Gases                   | 21,000,000  | 137   | Reported                        |
| GDF Suez                                  | France         | Utilities   | Multi-Utilities                    | 153,338,806   | 136   | CO <sub>2</sub>                 |
| MMC Norilsk Nickel OSJC                   | Russia         | Materials   | Diversified Metals & Mining        | 14,049,784  | 130   | Median                          |
| Reliance Industries                       | India          | Energy      | Oil & Gas Refining & Marketing     | 26,231,809  | 127   | Reported                        |
| POSCO                                     | South Korea    | Materials   | Steel                              | 88,138,000  | 123   | Reported                        |
| Petróleo Brasileiro SA - Petrobras        | Brazil         | Energy      | Integrated Oil & Gas               | 73,400,000  | 120   | Reported                        |
| Praxair, Inc.                             | USA            | Materials   | Industrial Gases                   | 18,035,000  | 120   | Reported                        |
| Endesa                                    | Spain          | Utilities   | Electric Utilities                 | 45,896,000  | 117   | Reported                        |
| Air Liquide                               | France         | Materials   | Industrial Gases                   | 21,103,000  | 116   | Reported                        |
| Occidental Petroleum Corporation          | USA            | Energy      | Integrated Oil & Gas               | 20,480,803  | 115   | CO <sub>2</sub>                 |
| Arcelor Mittal                            | Luxembourg     | Materials   | Steel                              | 207,000,000   | 112   | Reported                        |
| Statoil ASA                               | Norway         | Energy      | Integrated Oil & Gas               | 16,000,000  | 111   | Reported                        |
| Air Products & Chemicals, Inc.            | USA            | Materials   | Industrial Gases                   | 26,321,997  | 111   | CO <sub>2</sub>                 |

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