

Global corporate use of carbon pricing

Disclosures to investors

September 2014





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About CDP



CDP report summary

Companies in the U.S. and worldwide are already advanced in their use of carbon pricing. They are ahead of their governments in planning for climate change risks, costs and opportunities. These companies want, and are calling for, clear pricing and regulatory certainty to help them plan their climate-related investments, and they want to see more certain, internationally linked carbon markets.

COMPANIES AROUND THE WORLD ARE USING A PRICE ON CARBON.*

- The world's largest companies are climate ready. In the U.S., despite having no federal regulatory price on carbon, 29 major companies, including **Dow Chemical Company, Bank of America** and **ExxonMobil**, are incorporating a carbon price into their business planning and risk management strategies. Globally, 150 companies that report to CDP are using carbon pricing as a tool to drive investments in greenhouse gas (GHG) emissions reductions.

- From putting a price on carbon to participating in global carbon pricing markets, **companies are expecting, and preparing for, regulation:**
 - 496 global companies that disclose to CDP are part of a global carbon trading scheme; 96 (nearly 20%) of these are U.S. companies.
 - 69 U.S. companies disclose that they are already participating in the European Union's Emissions Trading Scheme (EU ETS).
- Global companies doing business in China and Korea, including **Alstom, Bayer** and **Canadian Tire Corporation**, are closely monitoring **emerging Chinese emissions trading systems** that will soon price carbon on a mandatory basis.

CARBON REGULATION PRESENTS BUSINESS OPPORTUNITY.

- European companies such as **Lafarge** and **Rockwool International** and others covered by the EU ETS, which prices carbon on a mandatory basis, want to see the system stabilize and improve to help protect long-term investments and expand profitability.
- 638 companies disclose that regulations related to carbon pricing (cap and trade & carbon taxes) present an opportunity for their businesses. By contrast, some companies in developing countries, especially heavy emitters such as **Arcelor Mittal South Africa, ÇİMSA ÇİMENTO SANAYİ VE TİCARET A.Ş.** and **PPC Ltd.**, continue to feel competitively disadvantaged by carbon pricing.

* For the purpose of this report, we identify a company as using an internal price on carbon if it specifically disclosed using an internal price or if it disclosed internalizing a market price in its business operations, risk management and/or investment decisions.

REPORT SUMMARY

COMPANIES ARE LEADING THE WAY TO CLIMATE READINESS.

- 212 companies disclose that they are **directly engaging with policy makers** on carbon pricing legislation, and that their corporate position is in support of these measures.
- Carbon taxes are emerging as an expected method of pricing GHG emissions, especially by companies already operating under the U.K.'s CRC Energy Efficiency Scheme.
- Companies reporting to CDP are showing clearly that major corporations not only recognize climate-related regulatory risks and opportunities, but also are proactively planning for them and are **outpacing their governments in thinking ahead**.

These findings are based on direct disclosures to CDP in 2014 from companies around the world. They provide the first global analysis of corporate use of carbon pricing drawn from information provided directly by companies themselves.

Disclosure is provided in response to CDP's annual climate change questionnaire, and is requested on behalf of 767 investors representing more than \$92 trillion in assets. The questions include requests for information on corporate climate change strategies, GHG emissions, reduction targets and

governance related to climate change management. Investors use this information to help evaluate their portfolios and inform their decision-making, shareholder-proposal preparation, and carbon-intensity evaluations.

This report synthesizes information from those disclosures that refers explicitly to use of a price on carbon, or to business implications of carbon pricing policies. The report presents:

1. A global and sector-based breakdown of companies that disclose utilizing an internal price on carbon;
2. Excerpts from those disclosures that provide insights into companies' use of an internal price on carbon; and
3. Excerpts from company disclosures detailing companies' views on the implications of carbon pricing and associated policies.

Combined, the data and disclosure excerpts in this report provide key topical insights on corporate attitudes toward emerging cap-and-trade systems and carbon taxes. And they serve as powerful evidence of a global corporate consensus that carbon will be priced.

This version of the report was updated on September 22 to amend inaccurate references to BG Group, GDF SUEZ and APA Group.

COMPANIES WORLDWIDE ARE CLIMATE READY



The world's largest companies are **outpacing their governments** in responding to climate change and expect carbon to be priced.



In fact, 150 major corporations, including **29 leading U.S. companies**, disclose using an internal price on carbon.



**20% ARE
U.S. COMPANIES**

Nearly **500 companies globally** report that they are already regulated through global carbon markets. 96 (nearly 20%) of these are U.S. companies. Of these, 69 are participating in the EU ETS.



638 companies report that they recognize that carbon regulation presents **business opportunities**.



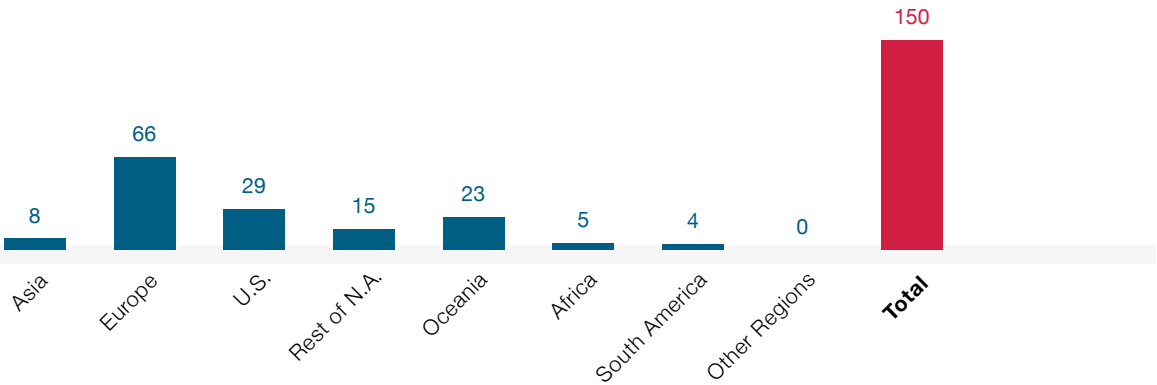
This is why more than 200 companies are directly engaging policy makers in support of **carbon-pricing legislation**, helping lead the way toward a low-carbon economy.

Companies
that disclose
use of an
internal price
on carbon

THE BUSINESS OF CARBON PRICING

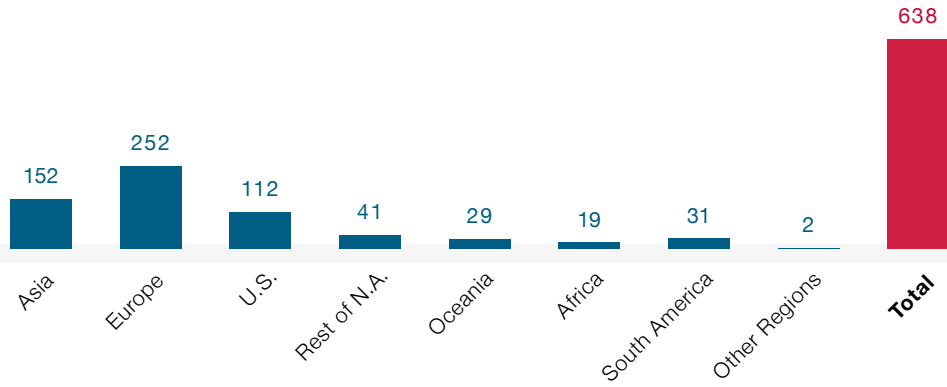
INTERNAL PRICE

Number of companies that disclose internalizing a price on carbon



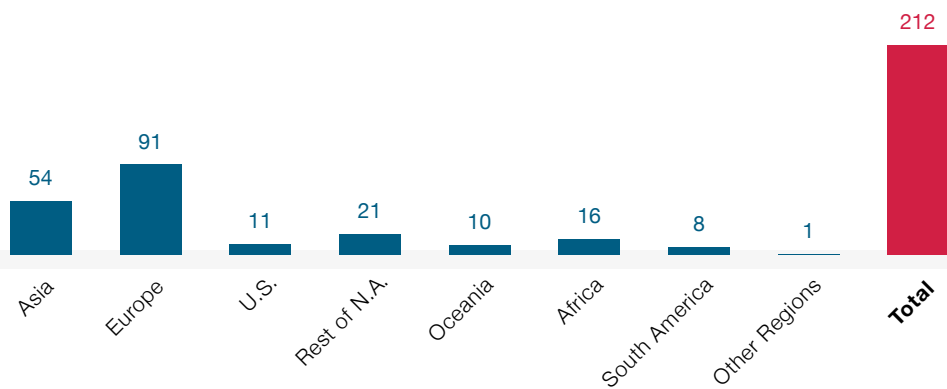
OPPORTUNITY

Number of companies that disclose that regulations related to carbon pricing (cap and trade & carbon taxes) present an opportunity for their businesses



ENGAGEMENT WITH POLICY MAKERS

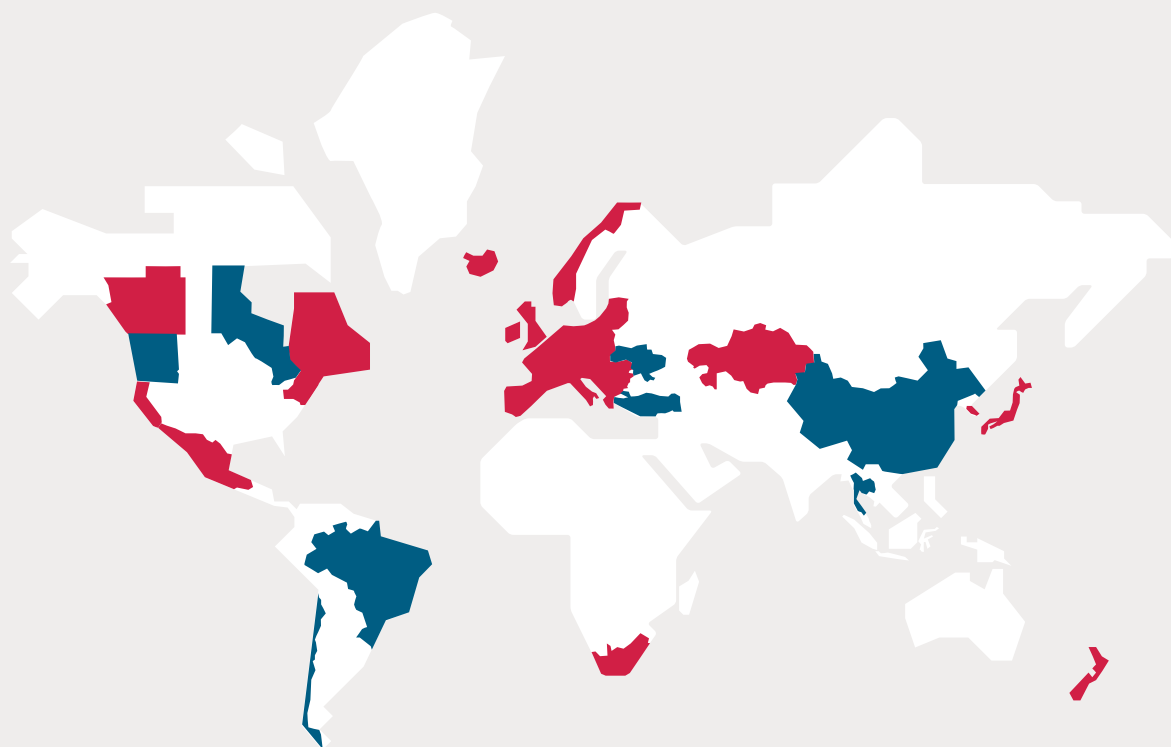
Number of companies that disclose they are directly engaging with policy makers on carbon pricing legislation (cap and trade & carbon taxes) and state that their corporate position is in support of these measures.



CARBON PRICING REGULATIONS BY REGION

The below map displays regions that have implemented or scheduled carbon pricing regulations (carbon tax or Emissions Trading Scheme), as well as those where carbon pricing is under consideration.

- Carbon Tax or ETS scheduled or implemented
- Carbon Tax or ETS under consideration



Scheduled or implemented

Alberta (Canada)
 Australia*
 British Columbia (Canada)
 California (U.S.)
 European Union
 Iceland
 Japan
 Kazakhstan
 Mexico
 New Zealand
 Norway
 Quebec (Canada)
 Regional Greenhouse Gas Initiative (RGGI)
 (Northeast U.S.)
 Republic of Korea
 South Africa
 Switzerland
 Tokyo

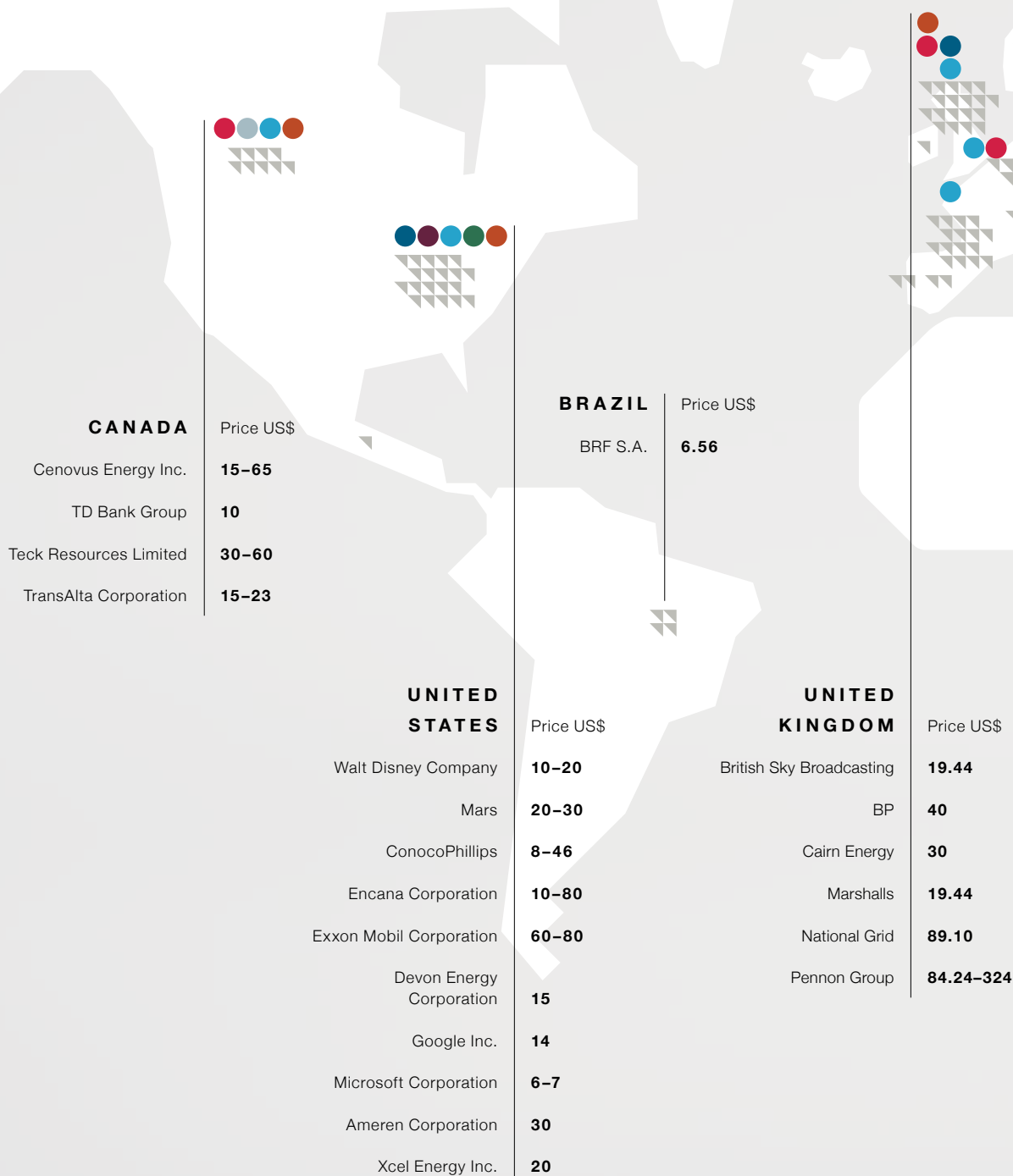
Under consideration

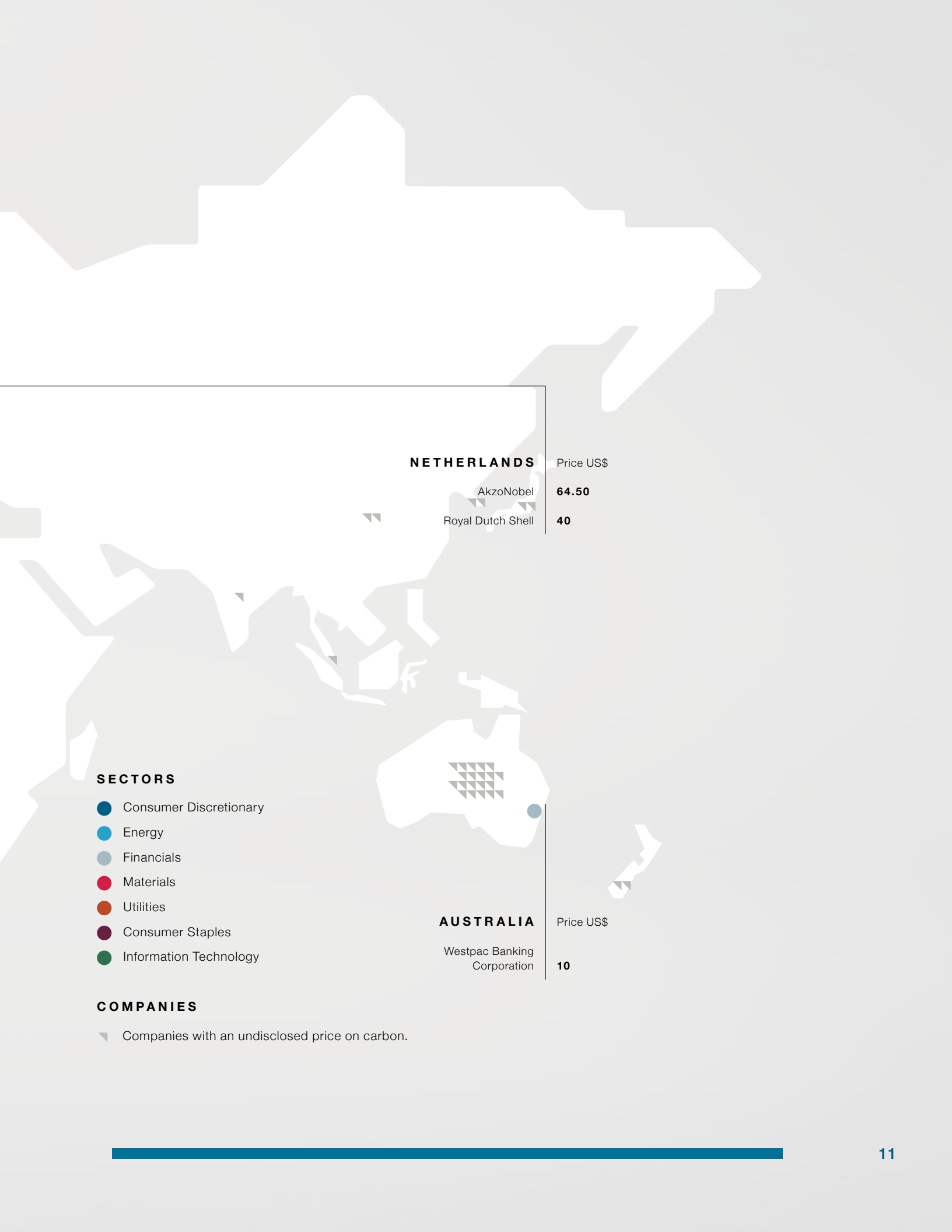
Brazil
 Chile
 China
 Manitoba (Canada)
 Ontario (Canada)
 Washington State (U.S.)
 Oregon (U.S.)
 Ukraine
 Thailand
 Turkey

***Australia:** The Australian Senate abolished Australia's carbon pricing system on 17 July 2014. Source: Reuters.

Map Source: World Bank

COMPANIES THAT DISCLOSE AN INTERNAL PRICE ON CARBON





AFRICA

CARBON PRICE DISCLOSURE BY SECTOR

COMPANY	COUNTRY	PRICE (US\$)
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FINANCIALS

Barclays Africa	South Africa	
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INDUSTRIALS

Barloworld	South Africa	
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MATERIALS

AngloGold Ashanti	South Africa	
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Kumba Iron Ore	South Africa	
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Sappi	South Africa	
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ASIA

CARBON PRICE DISCLOSURE BY SECTOR

COMPANY	COUNTRY	PRICE (US\$)
		Conversion Key: US\$1 = 0.76 euro, 0.61 GBP
CONSUMER DISCRETIONARY		
LG Electronics	South Korea	
ENERGY		
Essar Oil	India	
S-Oil Corporation	South Korea	
INFORMATION TECHNOLOGY		
Advantech Co., Ltd.	Greater China	
Coretronic Corporation	Greater China	
MATERIALS		
Mitsubishi Chemical Holdings Corporation	Japan	
Nippon Paper Industries Co. Ltd	Japan	
TELECOMMUNICATION SERVICES		
SingTel	Singapore	

EUROPE

CARBON PRICE DISCLOSURE BY SECTOR

COMPANY	COUNTRY	PRICE (US\$)
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CONSUMER DISCRETIONARY

BMW AG	Germany	
British Sky Broadcasting	United Kingdom	19.44
Coop Genossenschaft	Switzerland	
Marks and Spencer Group plc	United Kingdom	
PUMA SE	Germany	
Renault	France	
TUI AG	Germany	
WPP Group	United Kingdom	

CONSUMER STAPLES

Danone	France	
Morrison Supermarkets	United Kingdom	

ENERGY

BG Group	United Kingdom	
BP	United Kingdom	40
Cairn Energy	United Kingdom	30
Eni SpA	Italy	
Royal Dutch Shell	Netherlands	40
Statoil ASA	Norway	
Total	France	32

COMPANY	COUNTRY	PRICE (US\$)
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FINANCIALS

Altarea Cogedim	France
Aviva	United Kingdom
Banco Espírito Santo SA	Portugal
Banco Santander	Spain
Barclays	United Kingdom
BEKB / BCBE	Switzerland
BNP Paribas	France
Credit Suisse	Switzerland
Danske Bank A/S	Denmark
Deutsche Bank AG	Germany
Ernst & Young LLP U.K.	United Kingdom
Lloyds Banking Group	United Kingdom
Piraeus Bank	Greece
Société Générale	France

HEALTH CARE

Roche Holding AG	Switzerland
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INDUSTRIALS

Balfour Beatty	United Kingdom
Bouygues	France
British Airways	United Kingdom
Eiffage	France
Groupe Eurotunnel	France
Hamburger Hafen und Logistik AG	Germany
International Consolidated Airlines Group, S.A.	Spain
Saint-Gobain	France
Vinci	France
Wolseley plc	United Kingdom

EUROPE

COMPANY	COUNTRY	PRICE (US\$)
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INFORMATION TECHNOLOGY

Atos SE	France	
Groupe Steria	France	

MATERIALS

AkzoNobel	Netherlands	64.50
Anglo American	United Kingdom	
BASF SE	Germany	
BHP Billiton	United Kingdom	
Essentra	United Kingdom	
GDF Suez	France	
Holcim Ltd	Switzerland	
Johnson Matthey	United Kingdom	
Lafarge S.A.	France	
Marshalls	United Kingdom	19.44
OMV Aktiengesellschaft	Austria	
Rio Tinto	United Kingdom	
Smurfit Kappa Group PLC	Ireland	

TELECOMMUNICATION SERVICES

Magyar Telekom Nyrt.	Hungary	
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COMPANY	COUNTRY	PRICE (US\$)
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UTILITIES

Centrica	United Kingdom	
EDF	France	
EDP - Energias de Portugal S.A.	Portugal	
EnBW Energie Baden-Württemberg AG	Germany	
National Grid	United Kingdom	89.10
Pennon Group*	United Kingdom	84.24–324.00
United Utilities	United Kingdom	
VEOLIA	France	

*Projections for 2010 and 2050.

NORTH AMERICA

CARBON PRICE DISCLOSURE BY SECTOR

COMPANY	COUNTRY	PRICE (US\$)
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CONSUMER DISCRETIONARY

Canadian Tire Corporation, Limited	Canada	
Delphi Automotive Plc	USA	
Walt Disney Company	USA	10–20

CONSUMER STAPLES

Mars	USA	20–30
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ENERGY

Apache Corporation	USA	
ARC Resources Ltd.	Canada	
Canadian Oil Sands Limited	Canada	
Cenovus Energy Inc.	Canada	15–65
Chevron Corporation	USA	
ConocoPhillips	USA	8–46
Devon Energy Corporation	United Kingdom	15
Encana Corporation	Canada	10–80
Exxon Mobil Corporation	USA	60–80
Hess Corporation	USA	
Imperial Oil	Canada	
Spectra Energy Corp	USA	
Suncor Energy Inc.	Canada	
TransCanada Corporation	Canada	

COMPANY	COUNTRY	PRICE (US\$)
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FINANCIALS

Bank of America	USA	
Bank of Montreal	Canada	
Goldman Sachs Group Inc.	USA	
TD Bank Group	Canada	10

HEALTH CARE

Baxter International Inc.	USA	
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INDUSTRIALS

Cummins Inc.	USA	
Delta Air Lines	USA	

INFORMATION TECHNOLOGY

Google Inc.	USA	14
Microsoft Corporation	USA	6–7

MATERIALS

Barrick Gold Corporation	Canada	
CEMEX	Mexico	
Dow Chemical Company	USA	
E. I. du Pont de Nemours and Company	USA	
Teck Resources Limited	Canada	30–60

NORTH AMERICA

COMPANY	COUNTRY	PRICE (US\$)
UTILITIES		
Ameren Corporation	USA	30
American Electric Power Company, Inc.	USA	
Capital Power Corporation	Canada	
CMS Energy Corporation	USA	
Duke Energy Corporation	USA	
Entergy Corporation	USA	
Exelon Corporation	USA	
Integrus Energy Group, Inc.	USA	
Sempra Energy	USA	
The AES Corporation	USA	
TransAlta Corporation	Canada	15-23
Xcel Energy Inc.	USA	20

OCEANIA

CARBON PRICE DISCLOSURE BY SECTOR

COMPANY	COUNTRY	PRICE (US\$)
Conversion Key: US\$1 = 0.76 euro, 0.61 GBP		
CONSUMER STAPLES		
Treasury Wine Estates	Australia	
Wesfarmers	Australia	
Woolworths Limited	Australia	
ENERGY		
Aquila Resources	Australia	
Caltex Australia	Australia	
Santos	Australia	
Woodside Petroleum	Australia	
FINANCIALS		
Australia and New Zealand Banking Group	Australia	
GPT Group	Australia	
Insurance Australia Group	Australia	
Macquarie Group	Australia	
National Australia Bank	Australia	
Westfield Group	Australia	
Westpac Banking Corporation	Australia	10
INDUSTRIALS		
Qantas Airways	Australia	
Transpacific Industries Group	Australia	

OCEANIA



COMPANY	COUNTRY	PRICE (US\$)
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MATERIALS

Amcor	Australia
Boral	Australia
Fletcher Building	New Zealand
Fortescue Metals Group	Australia

TELECOMMUNICATION SERVICES

Chorus	New Zealand
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UTILITIES

AGL Energy	Australia
APA Group	Australia



SOUTH AMERICA

CARBON PRICE DISCLOSURE BY SECTOR

COMPANY	COUNTRY	PRICE (US\$)
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CONSUMER STAPLES

BRF S.A.	Brazil	6.56
Natura Cosméticos S.A.	Brazil	

MATERIALS

Braskem S/A	Brazil	
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UTILITIES

Companhia Energetica Minas Gerais - CEMIG	Brazil	
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Company insights on internal carbon pricing



AGL ENERGY

(Australia, Utilities)

Energy efficiency workshops were undertaken at the Loy Yang A Power Station to identify and rank emission reduction opportunities that could be implemented to minimize carbon compliance costs.... In the first year of the carbon pricing scheme, it is estimated that this has reduced costs for the facility by around \$4.5 million....



AKZONOBEL

(Netherlands, Materials)

We assign 50€/tonne CO₂ on all investment calculations.



AMCOR

(Australia, Materials)

Amcor supports a globally competitive price on carbon.



AMERICAN ELECTRIC POWER COMPANY, INC.

(USA, Utilities)

AEP has a long history of measuring and verifying its emissions as well as using a carbon price within its resource-planning process to aid in quantification. These data points, coupled with sensitivity analysis and scenario exploration, provide a framework for climate risk identification and mitigation.... Climate change management has become increasingly

integrated with our overall strategy through the use of a carbon price in corporate planning efforts and other strategic actions.... Coal's share of our portfolio is projected to drop to 49% by 2026, while energy efficiency and renewable energy shares will continue to grow.... AEP utilizes an internal price on carbon in all generation-planning decisions, which influences and encourages investment in low-carbon generation and divestment of high-carbon generation.



ANGLOGOLD ASHANTI

(South Africa, Materials)

The risk of increased costs from carbon taxes and/or cap-and-trade schemes is the biggest current risk. A better understanding of the available global and national carbon budgets has focused our attention on the scale of emissions reductions likely to be required. We want to be a good corporate citizen, including complying with all legislation where we operate. We support in principle having a price on carbon.... On 1 July 2015, the carbon price is supposed to transition to a fully flexible price under an emissions trading scheme. If an internal project meets the criteria, it will likely be cheaper (by avoiding intermediaries and their costs) to trade verified credits within the company. In addition, there are opportunities to sell credits to companies based in Europe and elsewhere.



APACHE CORPORATION

(USA, Energy)

GHG improvement programs have included testing sensitivities of carbon price variations, forecasting emissions based on business plans and production targets, evaluating local political expectations,

reducing emissions with enhanced efficiency or fuel switching, expanding natural gas electrification, and monitoring performance.... We evaluate various GHG reduction scenarios for anticipated carbon price costs in Australia, the U.K. and Canada to justify investments that are otherwise of marginal value.



AQUILA RESOURCES

(Australia, Energy)

Carbon liability on all projects is now more thoroughly understood, which assists the Board in making informed decisions on preferred options in the feasibility stage in terms of reduced carbon options and the associated costs.... Aquila's integration of full climate change costs into project modeling and evaluation enables more informed decisions to be made with respect to projects.



ATOS SE

(France, Information Technology)

For the past four years, Atos has run an offsetting program to make all of its data centers carbon neutral. This activity is ongoing, while progress is made to reduce energy consumption and to source zero carbon energy. The cost of these offsets is charged to each country in proportion with the emissions from their hosted data center operations. This provides an incentive for each country to undertake proactive emissions reductions, so as to reduce the offsetting cost.... [Current costs are] circa 1 million euros p.a. at current CRC¹ carbon costs. This is likely to increase

1. Carbon Reduction Commitment (CRC) is a mandatory carbon reduction scheme in the United Kingdom that is applicable to large, non-energy-intensive organizations.

to near 1.5 million euros over the next two to three years, as the cost per tonne of carbon increases.



AUSTRALIA AND NEW ZEALAND BANKING GROUP

(Australia, Financials)

Carbon pricing is now fully factored into our due diligence and assessment processes. The Carbon Renewable Working Group (CRWG) is implementing ANZ's business response by increasing staff awareness to assist them in applying our sensitive sector policies, engage with customers, conduct social/environmental screening and undertake credit analysis. We are also managing refinancing risk through the CRWG for these clients by working with them to understand their level of exposure to the carbon price; look at energy-efficiency opportunities which will not only reduce their current operating costs but also reduce future carbon emission trading schemes; and consider a price on carbon to provide revenue opportunities for ANZ both with existing clients and in new market developments.



BALFOUR BEATTY

(United Kingdom, Industrials)

By actively monitoring and managing our energy and fuel use we have [reduced] and are continuing to reduce the impact of future increases in carbon prices from our emissions, changes in emission factors and fuel/energy costs. We also pursue investment opportunities with a two-to-three-year payback to reduce emissions across our property portfolio, and work with our suppliers to reduce the emissions from our plant and equipment, again mitigating the impact

of future carbon tax increases. The cost of carbon is regularly reviewed as part of our risk register.



BANCO ESPÍRITO SANTO SA

(Portugal, Financials)

BES is aware that carbon capture and carbon costs have not been significant credit risk drivers to our clients. This factor is, however, becoming more important and, as such, BES is closely monitoring this for the coming years. In order to help face this challenge, BES sponsored a project with the goal of having environmental risks incorporated in the credit risk analyses of overall banking activities in all Portuguese banks.



BANK OF AMERICA

(USA, Financials)

Regulatory uncertainty presents specific risks to our participation in the global transition to a low-carbon economy. Policy-driven carbon markets, which place a price on carbon, are important for providing the incentives necessary for investment to facilitate the transition to low-carbon technologies. The price of carbon can be impacted significantly by regulatory uncertainty so that the financial incentive is not sufficiently powerful to effect change, slowing the level of investment in clean technologies.... In the U.S., the pattern of repeated expiration and short-term renewal of the production tax credit (PTC) results in a very dynamic wind-power market. This cycle is detrimental to the wind industry, since ramp-up and ramp-down costs are high, and uncertainties about the future of the PTC can undermine the attractiveness of, and increase the risk profile associated with, wind projects

for investors such as ourselves.... We use the Carbon Principles to assess the cost of carbon in our risk and underwriting processes associated with new electric power generation projects in the U.S.



BANK OF MONTREAL

(Canada, Financials)

Since 2008, BMO has been monetizing the value of carbon-emissions savings (based on an internally established price of carbon) and including the benefits as part of every energy-related business case.



BARCLAYS

(United Kingdom, Financials)

It is difficult for us to effectively calculate the financial implications of indirect risk exposure through our clients. We incorporate regulatory carbon risks into our wider credit-risk procedures where appropriate for both project finance and wider transactions and, in the case of heavy emitters, include the cost of carbon in financial-risk modeling.



BARLOWORLD

(South Africa, Industrials)

The cost of carbon is used in the decision-making process for emission reduction activities. The proposed carbon tax in South Africa...[is] considered when evaluating the feasibility of various emission reduction projects.... Carbon pricing schemes (both introduced and planned) have driven investment in

emission reduction projects. BAW has introduced an aspirational target to improve emissions efficiency and is actively implementing emission reduction projects to reduce the impact of a carbon price (current and in the future)....



BASF SE

(Germany, Materials)

An internal price of carbon has been set for...[BASF's] standard tool for the valuation of capital expenditure projects, research and development projects, and for production cost calculations.... In the context of the international climate debate, there are many discussions in progress on national climate action, such as the introduction of a carbon tax also outside Europe — for example, in China. BASF has production sites in 70 countries [including] China. Depending on the scope of the carbon levy, BASF could be directly and/or indirectly affected either through increased production costs and/or through impacts from the supply chain and downstream customers. However, the more countries are implementing a cap-and-trade scheme or any other carbon pricing, the lower the magnitude of impact will be, as we then would be able to pass on our carbon costs to our customers. The magnitude of impact is calculated on the assumption that not enough countries have implemented carbon pricing schemes yet to be able to pass on carbon costs.



BAXTER INTERNATIONAL INC.

(USA, Health Care)

Baxter factors a carbon price into investments in the U.K. and Ireland and may expand carbon pricing with investments to other countries/regions.



BEKB / BCBE

(Switzerland, Financials)

BEKB / BCBE has committed itself to be carbon neutral from 2011 on...and thereby put an internal price on carbon.



BG GROUP

(United Kingdom, Energy)

We include assessments of GHG mitigation opportunities and our own shadow carbon price as a sensitivity in evaluating the economics of all new capital projects and investments. In places where a government fixed or market price for carbon already exists, we incorporate this value into our base case economics, or our shadow carbon price if this is higher.... We use a range of project screening values relating to energy prices. We screen all our investments using a minimum shadow carbon price and an oil BOE PSV (barrel(s) of oil equivalent, Project Screening Value) that is broadly consistent with projected ranges under the IEA 450 scenario. In addition, we run a greater range of sensitivities for projects which are at high risk of near-term carbon regulation, for example our developments in Australia and British Columbia. These tests enable us to test the resilience of our capital-expenditure plans to a range of scenarios consistent with the 2 degrees Celsius goal.



BHP BILLITON*(United Kingdom, Materials)*

We believe there should be a price on carbon, implemented in a way that addresses competitiveness concerns and achieves lowest-cost emission reductions.... We have been incorporating a carbon price into all our investment decision-making for over a decade through the mandated use of our Carbon Pricing Protocol.... We look at the potential for reductions in emissions and the cost associated with those reductions to determine an appropriate price level for each relevant country or region.

**BNP PARIBAS***(France, Financials)*

As the European Commission has implemented short-term measures to strengthen the carbon market, carbon price is expected to rise in the next years. Thus, carbon market trading is constituting a growing tens-of-billions-of-dollars market, representing a major opportunity for the Group.

**BORAL***(Australia, Materials)*

In late 2011, we also developed Carbon Response Plans, which mainly focused on responding to the carbon price, but also addressed possible efficiency or abatement opportunities.... There will be significant (commercially sensitive) savings from reduced gas and electricity consumption as well, and improved manufacturing efficiencies.

**BP***(United Kingdom, Energy)*

We factor a carbon cost into our investment appraisals and engineering designs for some new projects. We do this by requiring larger projects, and for those for which emissions costs would be a material part of the project, by applying a standard carbon cost to the projected GHG emissions over the life of the project. The standard cost is based on our estimate of the carbon price that might realistically be expected in particular parts of the world. In industrialized countries, this standard cost assumption is currently \$40 per tonne of CO₂ equivalent.... Internally, we factor a carbon cost into our investment appraisals and engineering designs in order to assess, and protect the value of, our new investments under future scenarios in which the cost of carbon may be higher than it is today as a result of a regulated tax or trading scheme.

**BRASKEM S/A***(Brazil, Materials)*

The GHG emissions regulations in the states of São Paulo and Rio de Janeiro are already a reality and with challenges more rigorous than the [Brazilian] national plan.... The financial impact could be around \$1.5 million, considering US\$5.00 [to be] the carbon price in this market.... The establishment of emission limits encourages innovation in production processes, which in turn creates opportunities, especially saving energy and improving the company's economic performance.



BRF S.A.*(Brazil, Consumer Staples)*

The potential adoption of emission reduction targets by the Brazilian government can have direct financial impact on the company if these targets are to be transferred to the industrial sector. A carbon price could result in additional operational costs and impact future expansion plans.... Most likely, fuel and energy regulations will materialize as a carbon price. The company estimates an additional cost of R\$15.00 (€5,000, US\$6.56) per tonne of carbon above the limits established in a potential future regulation.

**BRITISH SKY BROADCASTING***(United Kingdom, Consumer Discretionary)*

A dedicated environment capex budget has been identified to fund projects which reduce absolute carbon emissions which fall outside business as usual (BAU). This has been designed to reduce our gross carbon emissions through non-BAU projects. In order to evaluate energy reduction projects, a price of carbon of £12 a tonne has been applied.

**CAIRN ENERGY***(United Kingdom, Energy)*

The potential impact of the cost of carbon is included in our assessment of new investment opportunities.... Actual cost of carbon taxes, e.g. our current carbon tax assumptions in development project economic models, is \$30/Te until end 2020 and \$35/Te from 2021.

**CALTEX AUSTRALIA***(Australia, Energy)*

The cost of carbon abatement is included in business planning and capital decision making.... The carbon price and legislated carbon pricing scheme has influenced the strategy through an increased focus on energy efficiency across the retail service station network, with technology evaluations being carried out....

**CANADIAN TIRE CORPORATION, LIMITED***(Canada, Consumer Discretionary)*

Canada and other countries from where CTC sources product (notably China and U.S.) are increasingly introducing regulations to curb GHG emissions.... Total carbon price risk for the Company's 2012 footprint was estimated between \$4.1 and \$38.2 million based on a regionalized carbon regulation analysis. This represents between 0.04% and 0.33% of CTC 2012 revenue.... Financial implications are expected to increase over time as regulations are expected to be implemented globally.

**CEMEX***(Mexico, Materials)*

With a price of carbon now in the California market, life cycle GHG emissions can be directly incorporated into a life cycle cost model for making pavement-investment decisions.... In order to mitigate the risk of a deficit, CEMEX is using all available levers to reduce CO₂ emissions in the corresponding operations that are economically feasible under the expected carbon price.



CENOVUS ENERGY INC.

(Canada, Energy)

Cenovus uses an internal carbon price model of \$15–\$65/tonne CO₂e to project estimated compliance costs of GHG emissions over a 10-year plan. Potential investments in GHG emission reduction activities are assessed against this model.... Cenovus's most substantial business decisions have been to integrate carbon pricing into our long-range planning....



CENTRICA

(United Kingdom, Utilities)

The cost of carbon has become an important factor in all investment decisions taken by Centrica in the power and gas markets.... Our investments in low-carbon energy are not only driven by regulatory compliance, but also by the wider economics, including the price of carbon. For example, the Renewables Obligation does not require us to invest in wind farms but it helps generate an economic rationale for doing so. The carbon floor price in the U.K. provides an additional investment signal for low carbon generation to support the EU Emissions Trading Scheme price, which has dropped to very low levels.... The outlook for the cost of carbon is uncertain as it is likely that the EU ETS will have to be reformed.... Changes to carbon prices can also lead to changes in asset values and our hedged positions. Our capacity to borrow money may change as lenders consider carbon risk in their lending decisions....



CHEVRON CORPORATION

(USA, Energy)

Consistent with Chevron's approach to managing greenhouse gases, the company recognizes the need to reduce GHG emissions where possible.... For major capital-project development and approval, we estimate a project's incremental emissions profile, assess the financial impact of GHG regulations, and describe the emissions reduction options considered and implemented. All capital projects of more than \$5 million must conduct an initial analysis to estimate emissions and their potential range of carbon costs and benefits. Analyses are then integrated into the capital-projects planning process.



CHORUS

(New Zealand, Telecommunication Services)

We expect the world-leading internationally linked New Zealand Emission Trading Scheme (ETS) is likely to continue to be the major instrument of climate change policy for the foreseeable future.... The most likely scenario we expect in New Zealand is a steady increase in the carbon price under the ETS. An increase in the carbon price will cause an ongoing increase in energy prices. Chorus forecasts increases in energy prices as part of our ongoing operational management.



CMS ENERGY CORPORATION

(USA, Utilities)

We evaluate a number of factors including an estimated carbon price for CO₂ emissions in our generation-capacity planning. Future generation planning incorporates this business strategy to make

sound business decisions.... We are moving from a compliance-driven organization to an accountability-driven organization where consideration of the impacts of our operations influences our future decisions, such as in the area of generation planning and evaluating new technologies.... Energy efficiency activities within our facilities are determined based on the return on investment. These calculations include an assumed price of carbon emissions.



CONOCOPHILLIPS

(USA, Energy)

In countries with existing or imminent GHG regulation, the cost of regulatory compliance is evaluated based on specific regulation and local carbon pricing information, and is incorporated into base-case investment decision-making. For operations in countries without existing or imminent GHG regulation, all capital projects costing \$150 million, or impacting annual emissions by more than 25,000 metric tons of CO₂e per year, must use a corporate cost of carbon forecast as a sensitivity to the base-case investment economics for management review.... Additionally, the long-range planning process considers the long-term changes to supply and demand of our primary products, oil and gas.... Where we operate in jurisdictions that have a cap-and-trade program, we find that most energy efficiency projects are made economic by the carbon price; however, cap-and-trade prices are variable and could result in some exposure to falling carbon prices.... In Norway, British Columbia and Alberta, the certainty of the carbon tax/cost has meant that energy efficiency projects can be undertaken without the risk of falling carbon prices.



COOP GENOSSENSCHAFT

(Switzerland, Consumer Discretionary)

To optimize the potential for reducing CO₂ emissions in a manner that is both technically feasible and financially sound, Coop has defined innovative principles for its investment evaluation and decision-making processes. The investment decision-making process is no longer based on payback guidelines, but on a comparison between the costs of reducing CO₂ and the alternative carbon costs (tax + offsetting) that might be incurred. By internalizing carbon costs in this way (assumption of CHF 150 per tonne of CO₂), Coop is acting as if it were already 2023. An internal calculation tool has been developed to help apply these innovative principles.



CREDIT SUISSE

(Switzerland, Financials)

By offsetting our entire global Scope 1, 2 and 3 carbon footprint, we are setting a substantial internal price for carbon. The budget for the offsets is carried by the four Credit Suisse regions and, therefore, helps to incentivize investments in energy efficiency at the regional level.



CUMMINS INC.

(USA, Industrials)

Cummins uses the cost of carbon as part of the financial decision-making process in energy efficiency capital funding projects.



DELTA AIR LINES

(USA, Industrials)

In addition to the cost of fuel, Delta has incorporated current CO₂ emissions costs into business decisions regarding routes to/from the EU in anticipation of compliance with EU ETS and regarding future expectations of CO₂ emissions costs into decisions for future aircraft purchases.



DEVON ENERGY CORPORATION

(USA, Energy)

For Devon's oil sands operations...every project is required to complete a project valuation prior to approval.... In 2011, the process was modified to include a carbon price of \$15 per tCO₂e to account for the cost or benefit associated with any change in GHG emissions resulting from the project.... As Devon's production in the oil sands increases, additional facilities will be subject to the regulation and the overall costs to operate the facility will increase as a result of the carbon price.



DOW CHEMICAL COMPANY

(USA, Materials)

The price of carbon is included in the Company's internal calculations used for prioritizing capital projects.



E. I. DU PONT DE NEMOURS AND COMPANY

(USA, Materials)

An internal carbon price is one of several methods that we use to guide investment in emission reduction and other capital-investment activities within DuPont. The way that we use this tool is to embed a high/medium/low carbon price scenario into our process for evaluating the economics of all capital investments over \$7 million (USD) and others with potentially significant GHG emissions impacts. The intended use of the internal carbon price related to significant new investments is to encourage consideration of existing or future scenarios where there may be a price on carbon (e.g., in a scenario with a high price on carbon, a more expensive but less energy-intensive technology or process improvement would have a more favorable return on investment compared to a scenario with a low or with no price on carbon).



EDF

(France, Utilities)

The cost of carbon is already used in the merit order which determines the planning of generation plants, and it is complemented by an offset policy for remaining emissions.... EDF investments in low-carbon energy are not only driven by regulatory compliance, but also by the wider economics, including the price of carbon.... As an order of magnitude, a 10% increase in the carbon price (highly probable given the volatility of this price and given the current predictions) would result in an increase of more than 16 M€ in the cost of purchasing quotas for EDF in France only.... Carbon-related regulations could allow EDF Group to be less impacted by carbon costs than some more-CO₂-emitting peers....



EDP—ENERGIAS DE PORTUGAL S.A.
(Portugal, Utilities)

[Carbon price is a] factor taken into account when analyzing investments in new projects such as new power plants.



**ENBW ENERGIE BADEN-
WÜRTTEMBERG AG**
(Germany, Utilities)

[EnBW uses] financial optimization calculations [and an] internal price of carbon.



ENCANA CORPORATION
(Canada, Energy)

Management and the Board of Directors review the impact of a variety of carbon-constrained scenarios on its strategy, with a current price range from approximately \$10 to \$80 per tonne of emissions applied to a range of emissions-coverage levels....



ENI SPA
(Italy, Energy)

Eni considers carbon price as a fundamental factor for assessing its investments in order to include the carbon cost at the very beginning of the investment-decision process....



ENTERGY CORPORATION
(USA, Utilities)

Future cost of carbon [is] considered in controllable purchase decisions to help ensure [that] Entergy's voluntary GHG-stabilization goals are cost-effectively achieved and to help ensure there is no leakage employed to meet these goals.... Entergy currently advocates a carbon fee or tax as a simple way to put a price on carbon emissions.



ERNST & YOUNG LLP
(United Kingdom, Financials)

We have robust energy data collation processes and build the cost of carbon allowances into our capital project evaluations.... [We have] ongoing costs [such as] purchase of CRC carbon allowances (approx. £175k p.a.). These costs may rise as the price of carbon (currently @ £12 per tonne) increases.... However, this amount represents <1% of our annual operating costs.



EXELON CORPORATION
(USA, Utilities)

Exelon typically evaluates all capital-investment decisions on the basis of traditional financial metrics.... Certain cases may assume more or less stringent environment standards or a regulatory price on carbon, and the outcomes in these scenarios are incorporated into the investment decision.... Exelon has been an advocate for climate policy that would establish mandatory, economy-wide GHG emission limits and a cap-and-trade program that would reflect the price of carbon in energy and other markets.... Exelon continues to support development of a long-term

national energy policy that places a price on carbon (utilizing market-based implementation and compliance mechanisms) to incentivize market-driven investments in lower-carbon technologies.



EXXON MOBIL CORPORATION *(USA, Energy)*

ExxonMobil addresses the potential for future climate-related controls, including the potential for restriction on emissions, through the use of a proxy cost of carbon.... The proxy cost seeks to reflect all types of actions and policies that governments may take over the Outlook period relating to the exploration, development, production, transportation or use of carbon-based fuels. Our proxy cost, which in some areas may approach \$80/ton over our Outlook period, is our effort to quantify what we believe government policies could cost to our investment opportunities. Perhaps most importantly, we require that all our business segments include, where appropriate, GHG costs in their economics when seeking funding for capital investments.



FLETCHER BUILDING *(New Zealand, Materials)*

There are emissions trading schemes in New Zealand and Australia. All of Fletcher Building's process, manufacturing-energy and transport-energy emissions are covered by the scope of the New Zealand scheme, and most are covered indirectly in the Australian scheme.... For both Australian and New Zealand businesses, the cost of carbon is now embedded in the planning and budgeting process, giving managers visibility of the impact of the costs imposed, directly or indirectly, by the Governments' schemes.



GDF SUEZ *(France, Utilities)*

In January 2014, a revised GDF SUEZ Environmental and Societal Responsibility Policy was published. In addition to the GHG reduction target, the document requires that the IRR of new investments shall be assessed considering carbon costs (including carbon taxes) or carbon revenues from the sale of carbon emission rights the project could be generating as well as considering other climate issues.... GDF SUEZ has advocated for a longtime action plan to fight climate change, a global price on carbon and a global carbon market, to face the challenges of energy efficiency and to encourage the development of renewable energies. In particular, GDF SUEZ calls for an increase of the level of ambition in line with the GHG concentration [that would] keep the temperature increase below 2°C. GDF SUEZ actively follows the development of the trading schemes throughout the world.



GOLDMAN SACHS GROUP INC. *(USA, Financials)*

Lack of clarity on stringency and timing of regulations, such as those relating to GHG emissions or placing a price on carbon, can pose uncertainty around costs for complying with those regulations.... Though markets have been volatile with carbon prices trading at historically low prices, the EU ETS remains the most liquid carbon trading market in the world. Despite challenging market conditions, trading volumes remain strong, so as more market opportunities open up we expect to be well-positioned to participate in future carbon opportunities.



GOOGLE

(USA, Information Technology)

Google does...face the risk of increased cost of energy if a price on carbon is applied through legislation such as cap and trade (or other mechanisms such as taxation). To the extent that this price is passed on to us from a regulated entity, the cost of running our operations will increase. However, we already operate some of the most efficient data centers in the world, procure renewable power for our data centers, and generate onsite renewable energy at several of our offices, all of which reduces our exposure to this risk. In addition, we already include a shadow price for carbon in our data-center-siting analysis to take into account this risk even before we build a data center. Finally, we are carbon-neutral through the purchase of high-quality carbon offsets, so in effect already include a carbon price in our operations.



HESS CORPORATION

(USA, Energy)

The most important components of the long-term strategy that have been influenced by climate change include GHG emissions minimization and regulatory changes. We address these through integrating carbon price risk, potential future regulatory constraints and energy efficiency considerations into our value-assurance process for major new investments. Beginning in 2013, the value-assurance process was expanded from new projects to include an annual review of all significant existing assets. This enables us to address potential regulatory risks and opportunities driven by current and future costs of carbon, and to promote more carbon-efficient choices for equipment decisions.



HOLCIM LTD

(Switzerland, Materials)

In 2013, Holcim completed a pilot project in India — the largest cement market for Holcim — that assigned a price to CO₂, determined a cost-abatement curve, and subsequently derived investment decisions for the period 2013–2020 to reduce its carbon footprint while improving its profitability.... International agreements aim at reducing CO₂ emissions usually most effectively by internalizing a cost of carbon. Depending on the scale of CO₂ emission reduction and the regulatory method to achieve that reduction, the cost of carbon could range from 0 to about 20CHF/ton CO₂. An international agreement could introduce a consistent cost of carbon emissions and...establish a level playing field between countries, rewarding the most efficient producers worldwide.



INSURANCE AUSTRALIA GROUP

(Australia, Financial)

IAG is a long-term supporter of a market mechanism to establish a price on carbon to encourage the active management and reduction of carbon emissions. We have advocated for the introduction of a cap-and-trade system on emission-intensive industries.... IAG's carbon-neutral commitment means that we have had an active internal price on carbon that has been input into decisions made about potential investment opportunities.



KUMBA IRON ORE

(South Africa, Materials)

Kumba has integrated emission reduction targets into its strategy measure to manage our footprint. The

impending carbon tax [in South Africa] has driven this decision to reduce exposure to carbon tax liability that Kumba may face.... Carbon price forecasts are used in all financial models when projects are assessed for financial viability.... The cost of carbon is included in optimization models to assess the impacts of carbon tax and emission reduction opportunities on projects.



LAFARGE S.A.

(France, Materials)

Carbon prices are an element contributing to the profitability of investments; thus low carbon prices can have the opposite effect and reduce low-carbon investments' profitability (energy efficiency, clinker substitution, fuel switch).



LG ELECTRONICS

(South Korea, Consumer Discretionary)

Under the Korean Cap & Trade Scheme, LGE should reduce about 5% of emissions annually...considering the average cost of carbon credit as 30 thousand KRW (US\$29.43).



LLOYDS BANKING GROUP

(United Kingdom, Financials)

Building on the broad messages of previous Communiqués, the 2012 Carbon Communiqué developed by the Group is the first in a series focusing on specific climate policy questions. It asserts that a clear and transparent price on carbon emissions is one of the main building blocks of a cost-effective,

pro-business policy framework for climate change. This should go hand in hand with other, complementary policies as part of a comprehensive approach.... The cost of carbon is incorporated into the Group's energy-budget forecasts and, therefore, has a direct impact on the Group's decision to invest in energy efficiency.



MARKS AND SPENCER GROUP PLC

(United Kingdom, Consumer Discretionary)

[We] continue to monitor and use theoretical carbon shadow pricing for modeling future emissions and costs.



MARS

(USA, Consumer Staples)

We could face a cost of \$40 to \$60 million...based on our Scope 1 & 2 emissions of just under 2 million tonnes and a carbon price of \$20 to \$30/tonne.



MICROSOFT CORPORATION

(USA, Information Technology)

From July 2012, we introduced an internal carbon-fee-chargeback model, administered through the finance group. Business groups responsible for carbon emissions associated with their use of Microsoft data centers, software development labs, offices, and business air travel are charged an internal fee to cover the cost to offset those emissions through investments in renewable energy and offset projects.



MITSUBISHI CHEMICAL HOLDINGS CORPORATION

(Japan, Materials)

The price of carbon is included in the internal calculation to promote the investment in some entities of MCHC.

Energy Group, we supported the U.S. EPA's issuance of proposed rules governing GHG emission limits for new power plants.

MORRISON SUPERMARKETS

(United Kingdom, Consumer Staples)

Participation in the CRC has, for the first time, put an actual cost on the price of carbon. Although the price is at this time reasonably low, around 7% of the cost of energy, the presence of such a large single cost to the business has brought carbon reduction to the fore.... The imposition of further carbon taxes will increase the cost for us to do business. The CRC and [the] price escalator of the Carbon Price Floor make this increase in cost of carbon virtually certain.

PENNON GROUP

(United Kingdom, Utilities)

[We use] a bespoke computerized system called 'Investment Manager' to prioritize investments in emissions reduction activities. This system uses carbon shadow pricing to monetize carbon emissions over the whole life of proposed projects. It uses the Government's shadow price, known as the 'non-traded price of carbon'. This is priced at between £52/tCO₂e (2010) and £200/tCO₂e (2050), and these annual values, and all those in between, are simply multiplied by the forecast whole-life carbon emissions as part of the company's overall cost/benefit analysis.

NATIONAL GRID

(United Kingdom, Utilities)

We believe that a strong carbon price signal in the economy is essential to drive the right behaviors, so have adopted this revised value in some of our investment decision-making processes across our operations. National Grid will continue to use the shadow price of carbon as it changes over time. To this end, we have used the value of £55 per tonne of carbon as the shadow price of carbon for 2013/14.... [In the U.S.] we support Regional Greenhouse Gas Initiative (RGGI) and are considering our position on tightening the emissions cap, pending some studies on customer-cost impacts.... Through our membership in the Clean

PIRAEUS BANK

(Greece, Financials)

Piraeus Bank...examined a specific sample of businesses in branches of the economy that may be adversely affected by climate change. Assessment of the consequences, as a percentage of total portfolio (2.8%–4%) was made, taking into account both climatic conditions and possible effects on the economy as well as fluctuations in the price of carbon dioxide emission allowances. In this case, 2.8% is the result of calculations based on a price of €4/CO₂ tonne, while 4% is based on a price of €25/CO₂ tonne.

QANTAS AIRWAYS

(Australia, Industrials)

All of the strategic initiatives are evaluated against external drivers, including current and impending carbon pricing, the rising price of fuel, and the sustainability of the current business model.... Qantas has embedded the cost of carbon into its internal reporting systems and business cases. Qantas has calculated its current and forward emissions profile and has plans in place to mitigate and/or manage impacts.... The Qantas Group faces a carbon price in three jurisdictions: New Zealand, the European Union and Australia, which has direct financial costs for the Group.... Given the significant competitive challenges facing the global aviation industry, the Group has been unable to pass through the cost of carbon to customers, resulting in a direct cost to the Group of \$106.01 million. The cost of administrative work and reporting is absorbed by the business.... The most significant cost the Group has is the investment in new fuel-efficient next-generation aircraft such as Airbus A380 and Boeing 787.



RENAULT

(France, Consumer Discretionary)

An internal price of carbon is taken into account in ROI calculations.... It is subject to short- and mid-term projections based on variation models, which integrate external factors such as the evolution of energy-market and EU-ETS regulations.



RIO TINTO

(United Kingdom, Materials)

We have an established process for regularly updating carbon price projections that are used in our business processes and decision-making.... RT's long-term investments take into consideration carbon pricing and understanding the impacts of carbon risks on strategic decisions.... As a cost of carbon is imposed on industry over time in multiple jurisdictions, Rio Tinto's large hydropower aluminum smelters and good performance in energy and greenhouse gas emissions efficiency due to [the] latest aluminum smelting technology further enhance a competitive advantage.



ROCHE HOLDING AG

(Switzerland, Health Care)

Genentech (a subsidiary of Roche) is managing the impact of the cap-and-trade program through close monitoring of policy and market developments, and preparation and regular review and update of associated financial-impact projections. We are actively pursuing natural-gas-reduction projects on our campus, and we are building the cost of carbon into cost/benefit analyses for such projects.



ROYAL DUTCH SHELL

(Netherlands, Energy)

We consider a potential screening value of CO₂ emissions at \$40 a tonne. This is a guide that is used in all our investment decisions.... A voluntary target approach will not lead to sufficient reductions in global GHG emissions.... We believe that a real carbon price in the global energy system will be the most

effective approach to managing GHG emissions.... We openly support robust regulatory action to manage GHG emissions.



SAINT-GOBAIN

(France, Industrial)

Carbon prices, originated from different regional regulations in force, such as EU-ETS, are integrated into our five-year business plans by the Corporate Planning and Economic Research Department. These plans guide our overall business strategy, giving trends and orientations for group decision-makers.



SANTOS

(Australia, Energy)

A carbon price is applied when comparing alternative project-design options.... Energy-efficiency projects are evaluated by the potential value of gas saved and the emissions-footprint reduction achieved.... Australian LNG producers currently incur a cost of carbon (\$24.15/tCO₂-e) not linked to international carbon prices, placing an additional cost on Australian LNG production and is therefore less competitive when compared to LNG sourced from other regions such as Qatar.... It is expected that a well-designed, technology-neutral, international carbon price will present opportunities for Santos. However, there is a risk that existing and future changes to carbon legislation may create market distortions. In the absence of an international carbon price, Santos is disadvantaged against international LNG producers from jurisdictions without carbon pricing policies.



SAPPI

(South Africa, Materials)

[An internal carbon price] is increasing in significance for Sappi's South African operations where, despite the high percentage of renewable energy (37%) used by the mills, the primary fuel source remains coal. In South Africa, costs of coal and purchased electricity (mainly carbon-based) are rising steeply. This has resulted in purchased energy as a percentage of cost of sales increasing from 10.9% in 2009 to 13.7% in FY2013. This is a very powerful driver for emission-reduction projects.



SEMPRA ENERGY

(USA, Utilities)

As part of the effort to meet California's Global Warming Solutions Act, which aims to reduce GHG emissions state-wide to 1990 levels by 2020, various programs have been adopted, including a cap-and-trade program that can link with other programs to create a regional market system. The cap-and-trade program, by design, is causing companies to focus on the cost of carbon, and therefore has increased the focus on cost-effective energy-efficiency programs to the benefit of customers. In 2015, when transportation fuels enter the cap-and-trade program, the cost of carbon will be incorporated in transportation-fuel prices, increasing opportunity for reducing emissions through increased use of alternative-fuel vehicles.



SOCIÉTÉ GÉNÉRALE

(France, Financials)

In 2011, the Group was one of the first banks to establish an "internal carbon tax", a mechanism that

is now at the heart of its strategy to reduce its carbon footprint. Each year, an amount is collected from the business lines based on their carbon emissions (EUR 10/t CO₂).... This internal redistribution incentive program thus encourages each entity to reduce its carbon emissions.



S-OIL CORPORATION

(South Korea, Energy)

A national emission trading scheme will be effective from 2015. In order to manage financial and non-financial impact from Korean ETS effectively, S-OIL operates a strategic carbon management system, which consists of forecasting BAU, analyzing financial impacts, optimizing investment portfolio, and communicating with stakeholders. Through the system, S-OIL can analyze long-term and short-term financial impact of any kind of carbon regulation, including emission trading and carbon tax, and develop cost-effective countermeasures in advance.



SPECTRA ENERGY CORP

(USA, Energy)

A company-wide business development process is used to evaluate business opportunities, including those driven by climate change such as demand growth due to carbon prices and regulatory frameworks.... Spectra Energy continuously evaluates opportunities to minimize GHG emissions from its facilities and has done a cost analysis taking the current and a possible future carbon price into account.



STATOIL ASA

(Norway, Energy)

Statoil has an internal carbon price that is used by each of our projects during the investment evaluation phase.... All investment decisions are tested toward lower oil and gas prices and higher carbon costs then assumed in the base case.... Statoil carries out regular break-even (project costs) analysis for reserves, and this year also how a 2C scenario could impact on break-even vs oil/gas price.... Statoil actively supports an international price on carbon and supports development and initiatives on carbon pricing and linking of carbon market schemes.... A stringent international agreement on climate, applicable for all countries, may present an opportunity for Statoil. It could create a level playing field and will benefit our gas operations through a high carbon price that will lead to fuel switching from coal to gas.



SUNCOR ENERGY INC.

(Canada, Energy)

Suncor uses a shadow carbon price that is significantly above current regulatory costs and applies a stress test to that price.



TD BANK GROUP

(Canada, Financials)

We measure our cost of carbon based on the costs of our carbon commitment, measured through the purchase of renewable energy credits (RECs) and carbon offsets. These costs are calculated on an annual basis and are charged back to our businesses based on their relative contribution, representing an internal price of carbon of approximately \$10 per tonne

of CO₂e. The price of carbon is used to drive decision-making and investment to manage future risks related to climate change.



TECK RESOURCES LIMITED

(Canada, Materials)

There is a great deal of uncertainty in determining the future financial implications of carbon costs. Current forecasting using a variety of scenarios demonstrates an exposure in 2020 ranging from \$30M to \$60M for our BC Operations alone. To manage these regulatory risks and their financial implications, we incorporate a carbon price into our capital- and risk-decision processes. Carbon pricing is integrated at multiple levels of decision-making, ranging from annual operating budgets developed at the site level to corporate decision-making over large capital investments. We also calculate and consider our carbon exposure in terms of both absolute costs incurred on an annual basis and projected out to at least 2020.



THE AES CORPORATION

(USA, Utilities)

The development and execution of our Corporate Strategy, as well as many Market Strategies, takes into account the specific risks associated with global carbon pricing. The investment decision process incorporates analysis related to the impact of environmental policy and carbon prices on potential investments.



TOTAL

(France, Energy)

Through the integration of a CO₂/carbon cost in all new capital-expenditure decisions since 2008, from the design of new activities to the revamping of existing facilities, all of our new projects/activities brought to the Board of Directors directly integrate the impact of our future greenhouse gas emissions.... One of the main drivers is the regulatory framework already in place and/or expected to be implemented in the different regions where the Group operates. As a result of this analysis, the Group decided in 2008 to include a medium-term carbon cost base-case analysis of 25 €/ton in all new projects.



TRANSPACIFIC INDUSTRIES GROUP

(Australia, Industrials)

One of the most important components of Transpacific's long-term strategy that is influenced by climate change is the focus on moving toward "zero waste to landfill".... The most substantial business decisions that have been made include...establishing a price on carbon relating to emissions from solid waste from Transpacific landfills.



TUI AG

(Germany, Consumer Discretionary)

TUI Group's proactive approach is to ensure that wherever possible the cost of carbon is factored into the way we do business — to drive efficiency. Carbon management is one of our core issues. The business is serious about driving carbon and cost out of the business with its flexible business model. Furthermore, fuel and energy conservation is an ongoing priority

for TUI across its operations, including airlines, cruise operations, differentiated hotels and our ground transport fleet.



VEOLIA

(France, Utilities)

Veolia is in favor of carbon prices that encourage investments in energy efficiency and renewable energy.... In some cases, the company's investment plans may be impacted by the obligation to integrate the cost of carbon. This is the case in the UK where, among others, water utility companies such as Veolia Water have to include "the shadow cost of carbon" in their investment-planning process.



WALT DISNEY COMPANY

(USA, Consumer Discretionary)

To achieve our long-term goal of "zero net direct greenhouse gas emissions," we have integrated [an] offset and emissions cost program that will have the effect of reducing direct emissions by charging the costs of carbon offset projects back to individual business units.... Thus, our businesses are now exposed to an internal carbon price. The "Climate Solutions Fund" is the name given to the Company's internal carbon pricing program.... This program essentially places an internal tax on carbon emissions, giving business units an incentive to reduce their carbon emissions. The program also places a known cost on carbon emissions, which allows the business segments to more accurately determine cost-effective efficiency projects to undertake.



WESFARMERS

(Australia, Consumer Staples)

With a carbon price, there is an opportunity for environmental performance labeling [and an] opportunity to introduce product-efficiency standards.



WESTPAC BANKING CORPORATION

(Australia, Financials)

Westpac supports maintaining the Carbon Price Mechanism.... The Westpac Group includes a \$10 price on carbon for all property-related energy-efficiency business cases.



WOOLWORTHS LIMITED

(Australia, Consumer Staples)

All trials and full implementation of energy efficient technology undergo Project Evaluations, which assess CAPEX requirements, Internal Rate of Return, NPV, ROFE and Payback Period. Estimated carbon costs are modeled as well, to determine how marginal projects may be affected by future carbon tax or emissions-trading schemes.



XCEL ENERGY INC.

(USA, Utilities)

[We use] an internal price of carbon, referred to by the Company as a Carbon Proxy Cost.... When examining future resources needed to meet our customers' needs, the company includes a carbon proxy cost to

project the expected future costs of carbon dioxide emissions on various planning scenarios. The carbon proxy costs are in the range of approximately \$20/ton. The company is also considering analytical methods to simulate direct Environmental Protection Agency regulation of carbon dioxide emissions in its environmental risk management and resource planning.

Implications of carbon pricing policies




AFRICA



ALLIED ELECTRONICS CORPORATION LTD (ALTRON)

(South Africa, Industrials)


The anticipated legislative impact on the price on carbon through a carbon tax [drives] the need for a reduction in greenhouse gas emissions — not only in South Africa, but also looking at global trends of carbon taxation, certification of products and the impact thereof on logistics and other supply chain components where the price of carbon will have a direct impact on products and services....



ARCELOR MITTAL SOUTH AFRICA LTD

(South Africa, Materials)

While the company appreciates that [the] government's aim in introducing [a] carbon tax is to change industry behavior and reduce South Africa's carbon footprint, the reality is that there is limited scope for steel producers to reduce carbon emissions. Existing technologies simply do not allow for more carbon-efficient alternatives, and there are no new technologies available either.




GOLD FIELDS LIMITED

(South Africa, Materials)

While the future international carbon price is currently highly uncertain, the fixed value of [the] carbon tax [in South Africa, R120 per ton of CO₂e], and, therefore, offsets, will reduce the risk of emission-reduction


projects.... Gold Fields believes that because of its work in the renewable energy and carbon sequestration fields, it will be able to relatively quickly implement additional offset projects which will: create additional income when sold to other companies; and mitigate emissions while generating co-benefits such as job creation and energy independence.



PPC LTD

(South Africa, Materials)

The [South African carbon] tax is proposed at a rate of R120/ton of CO₂e with a threshold of 60%. This will increase PPC operational costs and negatively affect further business operations.... [PPC's] competitiveness might be jeopardized, [as] there will be increased competition from limestone producers that do not have to pay carbon tax due to the fact that they fall under the minimum emissions threshold.... Carbon pricing is unlikely to be implemented uniformly across the globe and will negatively impact the competitiveness of PPC Cement plants that are located at the coast. This could ultimately result in the inability of PPC to do business.



SASOL LIMITED

(South Africa, Energy)

Sasol supports the transition to a lower-carbon economy and has outlined several initiatives being undertaken by the group to align our business with such a shift.


ASIA




CITY DEVELOPMENTS LIMITED

(Singapore, Financials)

At present, Singapore does not have a carbon price. The idea of a carbon price has been mentioned since 2010 by the Singapore Government.... The country would introduce it if a global climate change deal was reached....




its strategic focus. With South Korea recently signing into law the implementation of a “cap and trade” system by 2015 and the international agreement to sign a global accord by 2015 (Durban), the Philippines may have to introduce mechanisms that will value carbon emissions in the medium term.



COMPAL ELECTRONICS

(Greater China, Information Technology)


The average expected carbon price across all the ETS pilots that are in operation [in China] is RMB 32/t in 2014; RMB 41/t in 2016; and RMB 53/t in 2018.... We estimate that the increase in operating costs is RMB 5.12 million and yearly changes in the price.



JSW STEEL

(India, Materials)

There could be potential for [a] carbon price for Indian industries, which may in turn lead to increased operational costs and capital cost.... Any carbon price for Indian industries may help JSW to earn monetary benefits by being a net seller of carbon emission certificates.



FIRST GEN CORPORATION


(Philippines, Utilities)

The approved National Climate Change Action Plan (NCCAP), which is required under the Climate Change Law of 2009, does not mention any programs to introduce carbon pricing.... While the concept of pricing carbon has been discussed at various forums, the likelihood of any programs being introduced is small.... The NCCAP does mention the country’s “compliance with international commitments” as part of

KOREA DISTRICT HEATING CORP.

(South Korea, Utilities)

Additional revenues are predictable by selling unused emission permits under national emission trading in 2015, with technologies for reducing GHG emissions and enhancing energy efficiency.... If we are able to reduce 100,000 tonnes CO₂, we will obtain additional revenues of KRW 2.1 billion, which assumes KRW 21,000 per tonne CO₂ as its carbon price, so we could reduce operational cost.




ASIA



KOREA EAST-WEST POWER

(South Korea, Utilities)


GHG emissions are expected to increase until 2020, due to the construction of new power plants according to the national roadmap in order to keep up with the power-demand hike. In this context, EWP's compliance with the proposed cap-and-trade scheme is by no means [an] easy task.... While EWP is for GHG reductions, this company also believes there are not many competitive GHG-reduction technologies.... Without cheap mitigation tools, the prospect of an emissions-trading scheme is not so bright.



LENOVO GROUP

(Greater China, Information Technology)

Lenovo estimated the current costs to meet and sustain a 20% reduction in emissions for 20 years through the purchase of COs and RECs to be approximately \$3.5 million. If the proposed carbon pricing is implemented, our costs could increase by more than a hundredfold.



SONY CORPORATION

(Japan, Consumer Discretionary)


EU-ETS (European Union) and CRC (UK) are already established, and although Sony is not subject to the scope of application of EU-ETS and Australia's Carbon Price Mechanism, Sony Group companies in the UK are responding to CRC.... We anticipate that the cap-and-trade schemes may be established in other parts of the world, including developing countries, and therefore are watching the development closely.



TAIWAN SEMICONDUCTOR MANUFACTURING

(Greater China, Information Technology)

According to the current market price of carbon credit and [our] annual carbon-emission amount, TSMC will pay about US\$3M per year to buy carbon.



TOKYO GAS CO., LTD.

(Japan, Utilities)

By putting a price on carbon emissions, carbon taxes may encourage many businesses and households to switch to natural gas, thus increasing demand for CHP, natural-gas vehicles, and gas-fueled energy systems and appliances. If the tax revenue is utilized to subsidize gas systems, further growth can be expected.


EUROPE



AIRBUS GROUP

(Netherlands, Industrials)


AG supports the implementation of market-based mechanisms to fight climate change.... Nonetheless, additional measures such as national carbon taxes are a source of risk since they require specific articulation with existing cap-and-trade mechanisms such as the ETS. An internationally negotiated harmonization of these instruments is essential to avoid any form of international competition distortion.... Since no carbon price is currently included in the final oil price, there is no efficient price signal to reduce the consumption of oil worldwide, which results in the decrease of oil reserves.



ALSTOM

(France, Industrials)


CO₂ pricing mechanisms must deliver a meaningful and predictable carbon price, driving the necessary investment in sustainable technologies, including supply-side efficiency.... Stable, credible and long-term market-based support mechanisms, coordinated carefully with carbon pricing, can help to support the commercialization of newer technologies. The existence of cap-and-trade schemes is perceived as an opportunity to provide related products and services, as the rising price of carbon generally associated to these schemes, far from being detrimental for Alstom (e.g. increased operational costs), helps the commercialization of newer technologies.



ASTRAZENECA

(United Kingdom, Health Care)

We support the use of regulatory mechanisms to provide an effective framework to encourage industry to participate in the invention, development and use of low-carbon and adaptive solutions through, for example, appropriate and coherent financial, tax and trade policies. This should include use of market-based mechanisms that help internalize the true cost of carbon and that promote the development and use of low-carbon technologies and long-term solutions.



BT GROUP

(United Kingdom, Telecommunication Services)

BT is...in support of international agreements which help to firm up the long-term price of carbon in Europe. Continued uncertainty about the future cost of carbon in the EU ETS also creates uncertainty throughout our value chain. This uncertainty hampers our value chain's ability to plan for a low-carbon economy in the longer term, and to develop our products and services to meet uncertain market demands.



COLOPLAST A/S

(Denmark, Health Care)

More secure and leaner operations will enable us to mitigate and adapt to climate changes and related

EUROPE



changes in regulations and operational costs, which will enable us to reap the competitive benefits and opportunities [that] tighter climate-related regulations and higher energy/carbon prices will give us.



DS SMITH PLC

(United Kingdom, Materials)

Currently the ETS does not drive market behavior in the way we believe the regulator originally intended. The scheme is therefore not an effective driver of strategy. However, due to relatively high wholesale energy prices, continued investments in energy-reduction programs are taking place and investment in state-of-the-art efficient-energy production capacity remains a high priority. Should the ETS lead to higher carbon prices in the future, these existing strategies would continue to apply.



ELECTRIC IRELAND

(Ireland, Utilities)

ESB believes that a realistic carbon price is the best way to promote energy efficiency.... The inflexibility in the annual supply of carbon credits means that the fall in industrial output since 2008 has caused a large surplus, depressing the carbon price.... The price has been seen as too weak to incentivize energy efficiency and even so weak as to undermine the credibility of the system....



ENAGAS

(Spain, Utilities)

Once the cost of carbon may be internalized by an increase of CO₂ price or the inclusion of a carbon tax, the only way to keep competitive the use of fossil fuel, mainly carbon, for the generation of electricity, is the carbon capture, transport and storage [technology], thus probably regulation will promote this technology.



FORTUM OYJ

(Finland, Utilities)

At the moment there are no carbon constraints or price for carbon dioxide in Russia. Carbon price doesn't seem likely in the near future either.... Basically, our opportunities increase as the greenhouse gas emission-reduction requirements become stricter, because we are better placed than our competitors to meet those regulations.... Fortum will be a relative winner if the international agreement on a global market and carbon price is achieved.



HEIDELBERG CEMENT AG

(Germany, Materials)

Currently, the global political situation concerning climate change and climate-protection policies is very uncertain. Furthermore, there exists uncertainty on how different reduction pledges and cap-and-trade

schemes will be linked to develop a global carbon market and a functioning global regime. Depending on these developments, there is a risk of increased operational costs in the future and an investment risk.



ING

(Netherlands, Financials)

The past years have seen a far more modest development of ING's emissions-reduction loan portfolio. The reason for this has been a pronounced reduction in demand from our clients for debt to finance such projects. This can be explained by a decreased interest to continue investing in projects due to the severe drop in the price of carbon credits.



NOVO NORDISK A/S

(Denmark, Health Care)

The current uncertainty around whether there will be a global agreement replacing the Kyoto Protocol creates uncertainty about the future cost of carbon, globally and regionally, and the direction of future investment and capital flows. It increases the likelihood of more national and regional regulation and/or cap-and-trade systems that may increase Novo Nordisk's operational costs, among others in China, which is the third-largest market for Novo Nordisk.



REPSOL

(Spain, Energy)

2015 could achieve a global Climate Agreement that devises a great opportunity for our company for two reasons: (1) All oil and gas companies would play in the same field with the same rules. Carbon price would be embedded in the carbon footprint of every O&G player, regardless [of] where it is based; and (2) Repsol has drawn one of the longest-standing Carbon Strategies of the sector, gaining a competitive advantage on this issue.



ROCKWOOL INTERNATIONAL A/S

(Denmark, Industrials)

In theory, 5,000 million tonnes of lifetime (15–50 years) CO₂ savings — from the Rockwool insulation sold in one year — could represent a value greater than our annual turnover today (in 2013, EUR 1.6bn in the insulation segment). Getting full credit for all of these long-term savings is challenging due to the short-term focus of carbon credit systems and unstable regulatory conditions, e.g. expiry of the Kyoto Protocol, and low carbon prices in climate initiatives such as the EU ETS.




EUROPE



SABMILLER

(United Kingdom, Consumer Staples)

We believe that a price on carbon will be part of the future and is essential to promote the use of market mechanisms to reduce GHG emissions.



STANDARD CHARTERED

(United Kingdom, Financials)

Uncertainty surrounding climate change regulation creates significant risks for Standard Chartered efforts towards supporting a low-carbon economy.... The cost of carbon (or lack of it) can influence investment, and a lack of clarity on regulation could significantly affect our potential customers and their ability to repay loans or interest in taking out loans in a volatile market.




TELENOR GROUP

(Norway, Telecommunication Services)

Policymakers should make carbon pricing a central part of national policy responses by working towards the long-term objective of a carbon price throughout the global economy and setting sufficient ambition through internationally agreed targets to drive change at a pace commensurate with the 2°C goal.... We have calculated our possible carbon costs exposure in relation to increased climate change regulations


from 2014 onwards under different carbon price scenarios. We have estimated these potential financial implications to be less than 1% of Telenor Group's total operational costs.



TESCO

(United Kingdom, Consumer Staples)


Continued lack of international agreement to tackle climate change means different levels of ambition and carbon costs around the world as well as uncertainty about future policy. This will affect Tesco's investment decisions, and could reduce the return on investment of our existing energy-efficiency and renewable-energy investments.... Well-designed cap-and-trade schemes can be a way of creating a carbon price and reducing emissions at lowest economic cost.



UNILEVER PLC

(Netherlands/UK, Consumer Staples)

Unilever believes that carbon pricing is a fundamental part of the global response to climate change. Unilever also recognizes that without it, [the company] is unlikely to be able to meet its own greenhouse gas reduction targets.



**ZORLU DOĞAL ELEKTRİK
ÜRETİMİ A.Ş.**

(Turkey, Utilities)

We believe utmost care should be taken when setting the price of carbon in order to prevent any negative impact on competitiveness of actors in energy-intensive sectors. The prices should be reasonable and rational.


NORTH AMERICA



AIR PRODUCTS & CHEMICALS, INC.

(USA, Materials)


Any tax [or cap-and-trade scheme] that puts a price on carbon could drive new markets and/or grow existing ones. For example, interest in high-efficiency cogeneration facilities may increase. However, to grow new markets, the cost on carbon would be key. In order to stimulate interest in our CO₂ capture technologies the carbon price would need to be set high enough to make CCS economical.



HEALTH CARE REIT, INC.

(USA, Financials)


Proposals to put a price on carbon continue to be considered or implemented in regions [where] we conduct our business. Such increases in the cost of energy could negatively impact our operational expenses and financial results.... Relative to putting a price on carbon (taxes or a cap-and-trade scheme), HCN could see an increased operational cost associated with our associated energy spend, or approximately \$14,000,000.



CAMECO CORPORATION

(Canada, Energy)


As Cameco is a low emitter, introduction of a carbon tax would cause the cost of nuclear power to become more favorable when compared to typical hydrocarbon-based sources, as the cost of carbon taxes would ultimately translate into the cost of the various energy sources.



LEVI STRAUSS & CO.

(USA, Consumer Discretionary)


Put simply, we can run our business better with the certainty of a price on carbon, and government policies and incentives to help us to maximize energy efficiency and draw our energy from renewable sources.... Potential financial implications of this opportunity include improved business planning with a price on carbon.



COCA-COLA COMPANY

(USA, Consumer Staples)

With carbon prices costing up to 50 US\$/tCO₂-e, the company could see many cost benefits associated with a cap-and-trade system.



MORGAN STANLEY

(USA, Financials)

Clients' businesses may be impacted by increased fuel and capital costs for compliance, cutting funds for Morgan Stanley's goods and services. The Firm's participation in EU ETS and asset markets affected by rising carbon prices, and its ability to help clients meet their obligations, is an offsetting positive.



NRG ENERGY INC.

(USA, Utilities)

In 2013, we launched a company-wide initiative to re-evaluate and refocus our sustainability strategy.... Our short- and long-term strategies will help NRG profitably reduce its carbon intensity.... As increasingly stringent regulations or a carbon price are placed on the industry, we will be better positioned for low-cost compliance and have competitively advantaged clean energy products and services....



TARGET CORPORATION

(USA, Consumer Discretionary)

Federal proposals, and/or the efforts of states to regulate greenhouse gas emissions, would impact Target's business most significantly through increased prices for electricity and other fuels. Based on existing

programs, we anticipate a price of carbon ranging between \$2 and \$20 per metric ton. This translates to approximately \$6–\$60 million in additional expense.



UNITED TECHNOLOGIES CORPORATION

(USA, Information Technology)

UTC believes that carbon taxes and other market-based mechanisms could be important tools in the reduction of global GHG emissions.... UTC expects the number of [emissions trading programs] to continue to increase in our countries of operation and for the scope of included sources to increase as each program matures.



WAL-MART STORES, INC.

(USA, Consumer Staples)

Without a comprehensive federal regulatory scheme, the policies and resulting carbon prices would vary widely between states and regions. In the U.S. alone, we could see our annual utility costs increase by more than \$8,000,000 USD if a federal cap-and-trade scheme were passed and we were not able to offset our emissions through efficiency and renewable energy-based carbon credits.



NORTH AMERICA



YAHOO! INC.

(USA, Information Technology)

Yahoo understands that the changing policy landscape in the United States and globally may result in increased costs associated with conventional energy sources.... As the cost of carbon is integrated into the cost of electricity and fuel, it is likely that Yahoo's annual operational costs, particularly in energy-intensive data centers, may increase. However, these increased costs will be felt industry-wide.


OTHER REGIONS



JBS S/A

(Brazil, Consumer Staples)


The Company anticipates that it will incur additional costs as a result of (1) additional investments that will need to comply with new regulations, and (2) the price of carbon which [they] may need to pay as a result of their level of carbon emissions.



KATHMANDU HOLDINGS

(New Zealand, Consumer Discretionary)

An emissions-trading scheme is in place in New Zealand under the Climate Change Response Act 2002.... Kathmandu may be affected by variable pricing of materials and energy as costs are passed on to consumers....




LAMPRELL PLC

(United Arab Emirates, Energy)

The potential implementation of carbon-trading schemes and subsequent impost of a carbon price will improve the competitiveness of less GHG-intensive fossil fuels, such that the price of natural gas will be more competitive relative to oil. Climate change, therefore, presents an opportunity for Lamprell to explore new markets and develop its gas production, which will play an important role in the transition of the global economy to lower GHG-intensive fossil


fuels. The threat of climate change and the associated carbon impost will increase the need for energy efficiency in Lamprell's business.



STOCKLAND

(Australia, Financials)

The Australian government has repealed certain environmental regulation, including the price on carbon, creating a great deal of uncertainty in the market. It is unclear how/when the Direct Action Plan proposed by the new government will come into force, and whether or not the carbon price will be re-instated at a later stage due to international pressures.



TELECOM CORPORATION OF NEW ZEALAND

(New Zealand, Telecommunication Services)

The New Zealand Emissions Trading Scheme (ETS) has been operational since 2008 and is internationally linked. The most likely change expected in [the] future is a steadily increasing carbon price aligned with global markets. Telecom's ongoing investment in new network infrastructure and energy efficiency counter the energy-price risk.... As the carbon price increases over time, this is likely to increase demand for Telecom's services, which enable low-carbon solutions for customers. Such opportunities may become substantive if the carbon price were to increase significantly, however there is no indication that this will happen, at least not in the short to medium term.

About CDP



CDP is an international not-for-profit organization providing the only global system for companies and cities to measure, disclose, manage and share vital environmental information.

CDP works with market forces, including 767 institutional investors with assets of US\$92 trillion, to motivate companies to disclose their impacts on the environment and natural resources and to take action to reduce them. CDP now holds the largest collection globally of primary climate change, water and forest risk commodities information and puts these insights at the heart of strategic business, investment and policy decisions. Visit **www.cdp.net** or follow us **@CDP** to find out more.

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For access to a database of public responses for analysis, benchmarking and learning best practices, please contact info.usa@cdp.net.

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