How do companies do business in a carbon-constrained world?

Investment decisions and bottom line
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The business community must prepare for a carbon-constrained world. As regulation tightens and as stakeholders demand that companies do more to mitigate their environmental impact, business leaders must ask themselves challenging questions about their operations, strategy and reporting mechanisms. Low-cost energy efficiency programs, while effective to meet short-term objectives, will no longer be enough. "Increasingly, companies must ask themselves how they can adapt their entire business to succeed in a world in which carbon has become a scarce commodity" Juan Costa Climent, Global Leader, Climate Change and Sustainability Services, Ernst & Young.

Policy efforts to tackle climate change are an important driver of change. In December 2011, the international community agreed in Durban to establish a new climate change treaty that should, for the first time, involve all countries and see all major economies take on legally binding commitments. The new protocol is to be signed by 2015 and enacted by 2020. At the same time the Kyoto Protocol will continue beyond 2012, albeit without the US, Canada, Russia and Japan.

At an international level, the issue of tackling climate change has been translated into the vision of a transition to move toward a low-carbon economy within the next three decades. In order to achieve this transition, governments have different policy options to choose from. The two main carbon policy instrument options used by governments are carbon taxes and emissions trading (or cap-and-trade) programs which give emitters the right to release greenhouse gas (GHG) emissions at a cost. A carbon tax is a fixed price levy on the carbon content of the use of fossil fuels, with the level determined by the authorities. An increasing number of countries, developed and developing alike, have implemented or plan to implement carbon taxes, sometimes alongside or as a transition to a cap-and-trade system, as in Australia. India introduced a carbon tax on the production and import of coal in 2010. France, China and South Africa are considering national carbon taxes to be implemented in 2012 or 2013. South Korea is considering implementing a carbon tax in conjunction with a cap-and-trade system. In Europe, around 11 countries have implemented carbon tax systems on the use of hydrocarbon fuels.

By contrast, emissions trading programs set a limit on the amount of carbon or GHG emissions installations can emit, allowing participants to trade allowances to cover their needs, with prices set by market dynamics. Cap-and-trade systems are becoming increasingly popular around the globe. At present the European Union Emissions Trading System (EU ETS) takes up between 84% and 97% of the value of all carbon markets.1 In the US, the Regional Greenhouse Gas Initiative (RGGI), a regional cap-and-trade program involving the power sector in nine states and provinces in the US, has been active since 2009.2 New Zealand has an active national emissions trading scheme and Australia and Korea have recently passed laws to follow suit. The next few years will see numerous countries and states introduce cap-and-trade programs to join the more established EU ETS. The world's two biggest emitters, the US and China, are contemplating national emissions trading programs. In 2013, California, the world's eighth-largest economy, will introduce a cap-and-trade program. Although progress in the US is likely to be slow, China will soon start a number of regional pilot schemes, and could have a national program in place by 2015. If both countries join the EU in setting up a mandatory cap-and-trade system, the world's three largest economic areas would be carbon constrained. This could happen before 2020.

The carbon policies that have been implemented by governments over the past decade have given carbon a value. Market-based regulation has made carbon a limited resource and, as such, carbon has a price. So how does carbon affect investment decisions and company balance sheets? Are carbon-constrained companies less competitive in the globalized economy?

This paper looks at the impacts of a carbon-constrained world on the decision-making process and bottom line of companies, whether they operate in the US, Europe or developing countries. In our next paper in the series we will investigate the impact of ongoing developments in carbon markets around the world and how they will affect companies in the future.

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1 State and Trends of the Carbon Market 2011; World Bank, 2011. EU ETS could theoretically take up to 97% when taking into account the value of the secondary CDM market, which is driven mainly by the EU ETS. However, there is also demand from governments, as well as companies in Japan, New Zealand, and from the voluntary market.

2 www.rggi.org.uk
How do companies do business in a carbon-constrained world? Investment decisions and bottom line

Climate change represents an important opportunity for business, as well as a risk. As consumer behavior changes and regulation becomes more stringent, many companies will have an opportunity to develop new services, products and investments that are appropriate for a carbon-constrained world. As companies and populations are forced to adapt to the physical impact of global warming, there will be further need for innovation. Companies that think early about these longer-term opportunities will be the first to create value from them and achieve a long-term strategic advantage from climate change.

Companies must adapt to a carbon-constrained world. At present, most companies are pursuing inexpensive incremental measures to adapt to climate change. Over time, however, a much greater shift in mentality will be required to prepare for a carbon-constrained economy. Companies will need to consider how to make sustainable growth compatible with their business. Eventually, some businesses may realize that their business model is not appropriate for a low-carbon economy. At that point, they will either need to change radically, or be consigned to history.

The impact of carbon on corporate decision-making. Any major transition in the economy comes with costs, and a low-carbon future is no different. Much has been written on this subject in recent years, but the report that perhaps had the greatest influence on policy-makers was the Stern Review, which was released in 2006, and updated two years later.³ It proposes that an investment of 2% of global GDP per annum is required to avoid the worst effects of climate change. The key message is that this cost is far outweighed by the potential cost of inaction. Governments will divert much of this cost onto the private sector. This means that the cost of carbon will be an increasingly important driver of corporate decision-making processes. It is, however, important to note that cost is not the only carbon-related driver. The full set of considerations can be categorized as follows:

- Regulatory clarity and uncertainty
- Costs and benefits
- Stakeholder pressure (shareholders, investors, consumers)
- Risks and opportunities

These drivers and their effects on business strategy are discussed in this paper.

Key findings of this report include the following:

Energy costs are still the primary driver of abatement efforts. The carbon policies that have been implemented by governments over the past decade have given carbon a value. At present, however, the price of carbon is in general still too low to encourage companies to embark on major abatement initiatives. For now, companies are mostly pursuing inexpensive emission reduction measures with reasonable payback times. But as carbon becomes an increasingly limited and expensive resource, companies must rise up the cost curve and attempt more radical abatement efforts.

Regulation has encouraged many companies to put in place carbon management strategies. With one eye on a future, carbon-constrained world, many companies have implemented, or further developed, their carbon management strategies and incorporated carbon into management reporting and investment decision-making processes. Companies are also responding to pressure from investors and other stakeholders, who are starting to benchmark companies on their climate and carbon performance. This trend will continue to grow as new carbon regulations emerge around the world.

Improved carbon disclosure has helped to increase awareness and transparency of climate change issues. The Carbon Disclosure Project is an important development that engages companies in the climate change debate, and stimulates them to develop carbon strategies and infrastructure. Most of the top 500 companies in the world are now benchmarking themselves against their peers on climate change and carbon performance. Other companies will follow suit. In addition, a growing number of multinationals are putting pressure on their suppliers to do the same.

Cap-and-trade programs have had little positive financial impact on corporates, but this will change. The effect of carbon markets on the bottom line of companies depends greatly on the maturity of the specific market and the allocation methodology. Schemes, such as the EU ETS, are usually divided into distinct phases, which allows for market improvements. During the first two phases, there has been limited or positive impact on corporate financials. But as allocations become more stringent, the gap between high-performers and low-performers will widen. It is likely that the California cap-and-trade scheme will see a similar phased development in terms of stringency as its European counterpart.

³ STERN REVIEW: The Economics of Climate Change, 2006; http://webarchive.nationalarchives.gov.uk/+/http://www.hm-treasury.gov.uk/sternreview_index.htm
Regulatory clarity and uncertainty

In the past decade, the Kyoto Protocol (KP) and related carbon regulations have been the main driver for increasing carbon awareness among corporations, media and the general public. There are a number of cap-and-trade systems active at various jurisdictional levels. As the first of its kind, the EU ETS has been an example for all initiatives introduced since, both for its ambition, and for its shortcomings. The California ETS, which is due to commence in 2013, will be the next major scheme. More importantly, it plans to link up with the Western Climate Initiative (WCI) and may well prove to be a forerunner of a Federal program. More details of the scope of the Californian and EU ETS are presented in Case studies 1 and 2.

Some companies with obligations under emission trading programs have developed a carbon risk management strategy, and spent considerable time and energy understanding their emissions profiles and the potential value at stake from regulation. The fact that carbon has a value means that it has become a core business issue. In 2011, at least 73% of the Global 500 companies, the world’s largest companies by revenue, said that they have set responsibility for climate change at board or executive level. This increases the chances that carbon will be taken into account when making major decisions.

Regulatory certainty is an important factor in corporate decision-making. It is therefore critical that authorities create trust and stability in the market as well as incentives for long-term investments. Most companies would prefer rigorous, well-designed, transparent and long-term carbon regulation over less stringent, but more uncertain regulation.

Ideally, companies would like to see regulation harmonized globally, with a global carbon price and long, stable compliance periods that would ensure payback on investments. This will ensure a level competitive playing field and give companies predictability. Realistically, however, this is still a long way off.

As Mark Kenber, CEO of The Climate Group says, “The most important thing that all corporates are looking for in carbon – and any other policy – is certainty; certainty that the policy will be implemented, certainty that all will be treated equally and transparently, and certainty that policy will not be changed abruptly and without warning. Within this, corporates prefer policy that allows them to meet their obligations at the lowest cost possible. In many cases these will be market or other price-based approaches, though sometimes direct regulation – for example product standards – may be preferred if implementation costs are lower.”

In the first phase of the EU ETS, regulatory uncertainties had an adverse effect on investments. Several lawsuits were started by Member States against the European Commission over allocations. News of the over-allocation of Phase I also created widespread confusion. For this reason, the third phase of the EU ETS will last eight years rather than three (Phase I), or five (Phase II), in order to achieve greater long-term stability (see Case study 1 on the EU ETS).

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4 The largest driver for all the current carbon and climate regulation activity is the Kyoto Protocol to the UNFCCC, setting targets for most of the world’s industrialized nations to reduce GHG emissions over the five-year period 2008–12. The KP sets binding targets for 37 industrialized countries to reduce GHG emissions.

5 Carbon Disclosure Project 2011.
Case study 1: The European Union Emissions Trading System

The European Union Emissions Trading System was initially set up in two phases. A pilot phase was undertaken from 2005 to 2007, and a second phase ran from 2008 to 2012, which was in parallel with the Kyoto first commitment period. The EU has since decided on a third phase, which will run from 2013 to 2020, regardless of whether an international climate agreement can be reached to replace the Kyoto Protocol, which expires in 2012.

Trading in the first phase was limited to CO$_2$. It covered energy-related emissions and process emissions from specified industrial activities. This included power stations, refineries and offshore operations, iron and steel, cement and lime, paper, food and drink, glass, ceramics, engineering and vehicle manufacture. Phase II added an opt-in for N$_2$O emissions from nitric acid production, in specific countries.

The first two phases of the EU ETS were important learning experiences for the EU, and indeed for the rest of the world. There have been a number of teething problems. Phase I saw carbon prices drop to zero when the market turned out to be oversupplied with allowances to emit. Phase II, until 2011, saw the power sector short on allowances while industry on average received more than they needed. This effect was partially caused by a decrease in production following the economic crisis.

The European Commission has promised widespread changes for Phase III. For example, it has fully harmonized the allocation methodology for all sectors and set a stricter overall cap. The free allocation system used in the first two phases may have led to windfall profits for sectors that could pass carbon costs on to consumers. So, to increase the economic efficiency in Phase III, the Commission will now escalate the level of auctioning, which means that emitters will need to pay for their allowances. Utilities will have to purchase 100% of their allowances. For the industry and heating sectors, a benchmarking system that rewards the most efficient installations in a sector or subsector has been introduced with the hope of stimulating internal abatement and energy efficiency measures. The most efficient installations will receive all the allowances they need for free, while others will need to purchase additional allowances to cover their needs.

These rules will not apply, however, to sectors that are exposed to a “significant” risk of carbon leakage, where reductions in one country lead to increases in another. To protect these sectors from unequal competition from outside the EU, they will get 100% of their allowances for free up until 2020, based on the same benchmarks. There were 164 sectors and subsectors identified to be at risk of leakage.

**Case study 2: The Californian cap-and-trade scheme**

In January 2013, the California Emissions Trading Scheme will launch, becoming the second-largest emissions trading program worldwide after the EU ETS. It is a key element in AB 32, California’s climate law, which requires California to return to 1990 levels of GHG emissions by 2020. This state-wide system will initially cover the power sector and large industrial facilities, which account for around 85% of California’s GHG emissions. From 2015, the scheme will be expanded to cover distributors of residential, commercial and transport fuels.

In the first year, the cap for emissions is set at 2% below business-as-usual forecasts for 2012. Thereafter, it will be reduced by 2%-3% every year until 2020. Allowances to emit will initially be provided for free, but will be auctioned at later stages. This will be based on a benchmarking system that rewards efficient installations. Next to trading, companies will be allowed to bank allowances between the three-year compliance periods. Also, emission reductions achieved outside of the scheme may be used. These are limited to 8% of a facility’s compliance obligation and initially to US-based projects from the following sectors: forestry, urban forestry, dairy digesters and destruction of ozone-depleting substances. In the future, international offsets may be accepted.

The California ETS is designed to link up with other schemes in order to increase environmental effectiveness and efficiency. California is already a participant in the planned Western Climate Initiative (WCI), a collaboration involving California and the Canadian provinces of Quebec, British Columbia, Ontario and Manitoba. The aim of WCI is to identify, evaluate and implement policies to address climate change and it has set a target to reduce regional GHG emissions to 15% below 2005 levels by 2020. A mandatory, regional, multi-sector cap-and-trade program has been designed under the WCI and is set to commence in 2013. Although six US States withdrew from the WCI in 2011, a number of US, Canadian and Mexican regional jurisdictions are official observers of the program.

Linkage with the EU ETS has also been contemplated and the voluntary Swiss ETS is reforming itself for the same purpose. The experience of the European system will provide valuable lessons for California as it embarks on the scheme. Nevertheless, the complexity of the undertaking means that there will most probably be challenges ahead. The stakes are high — across the rest of the US, all political eyes will be on the Californian ETS, as it is evaluated as a template for a Federal program.
Costs and benefits

In general, the impact of carbon regulation on a firm’s net income is defined by costs and benefits related to the:

- Administrative burden
- Abatement measures
- Carbon positions and prices
- Carbon and energy prices

In turn, these factors feed into a firm’s business strategy and decision-making process.

To date, however, only limited research has been carried out to evaluate the costs and benefits of carbon regulations for business. This is a complex area, requiring access to business strategies and detailed financial statements, along with an analysis of both direct and indirect effects. Even so, some of the costs and benefits may not show up on a firm’s financial statements for some time, or even at all. For example, energy efficiency measures will have a direct impact on energy costs and show up immediately on the balance sheet, while investments in innovative technology may only have a payback in several years’ time. Some benefits of corporate social responsibility (CSR), such as improved competitiveness and more motivated personnel, may not be provided an economic value and therefore will never be directly visible in the corporate accounts.

Other initiatives may have an impact that goes beyond the company’s boundaries such as social or environmental projects but may enhance the brand value of the firm.

The administrative burden

Compliance with carbon regulation can consume considerable time and resources. A company involved in a cap-and-trade program will need to understand what is at stake, both financially and organizationally. It will need to know its historic emissions, growth figures and how this may be translated into emissions and carbon. It must also monitor its emissions constantly and ensure that they are verified externally every year.

The firm will also need to understand how to trade carbon, lobby the appropriate authorities and develop a corporate carbon management strategy. Some companies may have little experience of these issues, which means that even though direct costs may be limited, they could incur significant impact in staff, training, legal activities and building the organizational infrastructure. Naturally, this burden will weigh more heavily on a small pulp and paper factory than, say, a large utility company.

But although the administrative costs can be high, companies should consider them as an investment with a potentially significant payback. Those firms that take a proactive approach to developing carbon management policies and strategies are more likely to see a large impact on the efficiency and returns of a plant.

Abatement measures

The value of carbon means that investments in carbon abatement and energy efficiency have an additional incentive, beyond cost savings on energy. Companies should review their options for reducing emissions in-house, and assess the extent of these opportunities based on the prices of carbon and energy.

Companies will typically have a mix of in-house abatement options, including energy efficiency, onsite renewable energy and fuel switching (e.g., from coal/oil to gas). Each of these options will have different costs and benefits, which can be compared directly by expressing them in terms of cost per tonne of CO₂ saved. Companies can then prioritize which options to pursue, and determine whether or not they need to put a carbon trading strategy in place.

Companies that operate in a carbon tax or cap-and-trade system face rigorous monitoring and reporting requirements. As a result, they will typically place greater importance on carbon and energy consumption. Many will have already implemented a carbon management strategy, and incorporated carbon into their management reporting and investment decision-making processes.
Experience shows that companies with a carbon management strategy will be more aware of the possibilities to reduce energy and carbon emissions. Many will have already achieved the quickest gains, such as inexpensive energy efficiency measures. Fewer, however, will have considered abatement options higher up the cost curve because a combination of free allocation of carbon through the EU ETS, and the economic crisis, has meant that there has been little incentive to do so. The California cap-and-trade system will initially see allowances being allocated for free in the course of 2012, whereas RGGI auctions almost 100% of the permits.6

According to surveys among the top 500 largest companies globally, the most popular carbon reduction measures are energy efficiency, behavioral change (such as training and education of staff) and low-carbon energy installation.7 Payback times for the first two are normally achieved within three years. This means that companies will generally prefer these incremental emission reduction measures, rather than undertaking more radical low-carbon transformations. However, almost a fifth of the world’s largest companies employ low-carbon energy installation activities, which have medium to long-term payback times.

A well designed carbon tax or cap-and-trade program, with a reliable carbon price, should do more to encourage real abatement, using measures such as low-carbon energy installations that are higher up the cost-abatement curve. In the third phase of the EU ETS, the level of auctioning will be increased, up to 100% in the case of the power sector. California will follow a similar path, where it will gradually decrease the cap, and increase the level of auctioning. These measures should do more to encourage companies to consider more expensive, but beneficial, abatement options.

Carbon regulation is not the only driver for companies looking for low-carbon strategies. Many companies are attracted to abatement options solely because of the cost savings that can be achieved. Walmart, an American retailer and the world’s largest company by revenue, saves over US$150m annually from an energy efficiency program that it started in 2005.8 Senior management are incentivized on carbon and energy performance.

Case study 3: Consolidated Edison’s sustainability strategy

Consolidated Edison (Con Edison) is one of the largest investor-owned energy companies in the United States, with approximately US$14b in annual revenues and US$36b in assets. Founded in 1823, Con Edison is now an S&P 500 company that consists of several regulated and unregulated subsidiaries. These provide electric, gas and steam services, own and operate generating plants, and participate in infrastructure projects throughout the United States.

Con Edison owns seven power plants but its long-term strategy is to transition the company to renewable power generation. The company supports customer efforts to reduce electricity consumption through energy efficiency and energy management, and encourages its customers to switch fuel usage from distillate oil to natural gas. It also intends to replace the company’s fleet with hybrid and compressed natural gas (CNG) vehicles. In 2008, Consolidated Edison Development, a subsidiary of Con Edison, sold all its fossil-powered generating assets.

The company is preparing itself for a carbon-constrained world and has integrated climate change and sustainability into its overall business strategy. It has carbon reduction obligations under RGGI but has also set voluntary emission reduction targets to reduce 40% of its direct emissions by 2020 (compared to 2005 levels) and incentivizes management to achieve these goals through a system of key performance indicators (KPIs) and monetary rewards. Most of the actions have a payback time of greater than three years. The company also actively lobbies the Federal government for a Federal carbon scheme that covers all sectors, whether under a cap-and-trade system or a carbon tax.

Source: CDP 2011 Investor: Consolidated Edison, Inc. response

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6 It should be noted that RGGI covers the power sector only who are able to pass on the cost of carbon to the customer.
8 Walmart CDP investor response 2011. As part of its sustainability strategy Walmart has set voluntary GHG emission reduction targets both for its own operations (20% reduction by 2012 compared to 2005 emissions) as well as its supply chain (20 million metric tons of greenhouse gas emissions from the life cycle of the Walmart products by the end of 2015).
Carbon positions and carbon prices

At the end of each compliance year, a company may find that it has either a surplus or a shortage of emissions allowances. This outcome will depend on a variety of factors, including the extent of its allowance allocation, and the scale of its emissions. A company can optimize its carbon position by putting in place a sound carbon risk management and trading strategy. By forecasting its production (and hence, its emissions) and then combining this with current and expected carbon prices, a company can determine a balance between investing in abatement measures, such as innovative technology, or purchasing additional allowances.

A carbon risk management strategy will focus on the trade-off between reducing emissions and trading strategies. The former may consist of a combination of short-term measures, such as energy efficiency initiatives, and long-term options, such as investing in R&D and innovation. This may include carbon hedging, purchasing (international) offsets in the secondary market or investing directly in projects, clever banking and borrowing.

The EU ETS has had a major role in determining the impact of carbon regulation on company balance sheets. As other programs are either too small, immature or narrow in scope, the only reference point is the historical carbon prices of the EU ETS. General conclusions derived here could serve as a precedent for companies in the US, Australia, China and any other country that will see cap-and-trade systems commence.

Figure 1: Development of bid-offer closing price for EU allowances.

The figure above shows the development of carbon prices since the start of the EU ETS. As can be seen, carbon prices have fluctuated dramatically over time, while in the past couple of years, they have not exceeded €15–€20 (US$19–US$26) per tonne. Most next-level abatement opportunities will need prices significantly higher than that to encourage companies to make the necessary investment decisions. In the US, current and envisioned prices within the RGGI and California schemes are significantly lower. For the time being, these systems are still immature. As a result, it will take time for higher-level abatement measures to be economically viable. Moreover, California’s historic leadership in promoting low-carbon development means that further abatement may be costly.

Source: Thomson Reuters Point Carbon 2011 (10)
During Phase I and Phase II of the EU ETS, the impact of carbon regulation on corporate balance sheets has generally been positive, at least in the first six years of these phases. Figure 1 below shows the top 10 companies by highest surplus in 2010. The last column shows the potential value of the surplus allowances using a weighted-average allowance price.

In general, Phase I and II gave industrial sectors an oversupply of allowances. The steel and cement sectors have been the biggest beneficiaries. For example, ArcelorMittal has the largest potential surplus in absolute terms at €449m. This is equivalent to 21% of its net income. But in relative terms, the potential surplus for HeidelbergCement is even greater at 30% of its net income (although lower in absolute terms at €101m). Companies in these sectors attribute their surplus to decreased levels of production during the economic crisis. It should also be noted that energy costs are relatively high for the steel and cement sectors, and the power price has a carbon component. So these sectors are impacted directly and indirectly by carbon.

The power sector, by contrast, has experienced a shortage of allowances. European utilities have been the focus of efforts by the Commission to make the large cuts in emissions needed to reach the overall target set for the EU ETS. As a result, a number of companies have experienced significant shortfalls. The three companies with the highest shortage in Phase II (up to and including 2010) were RWE, E.ON and Vattenfall. These are also the largest emitters in the EU ETS. The table in Figure 3 below shows their short positions for 2010.

As the cost of these shortages is passed on to the consumer, this value does not weigh heavily on the utilities financial results.

### Figure 2: EU ETS companies with highest carbon surplus in 2010

<table>
<thead>
<tr>
<th>Company</th>
<th>Sector</th>
<th>Allocated allowances 2010 (m)</th>
<th>Verified emissions 2010 (mt CO₂)</th>
<th>Emissions to cap (=E-C) 2010 (m)</th>
<th>Potential value of surplus (m Euros)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ArcelorMittal</td>
<td>Iron &amp; Steel</td>
<td>87</td>
<td>56</td>
<td>-31</td>
<td>449</td>
</tr>
<tr>
<td>Tata Steel Europe</td>
<td>Iron &amp; Steel</td>
<td>35</td>
<td>21</td>
<td>-14</td>
<td>203</td>
</tr>
<tr>
<td>Lafarge</td>
<td>Cement</td>
<td>29</td>
<td>18</td>
<td>-11</td>
<td>159</td>
</tr>
<tr>
<td>Heidelberg</td>
<td>Cement</td>
<td>24</td>
<td>17</td>
<td>-7</td>
<td>101</td>
</tr>
<tr>
<td>ThyssenKrupp</td>
<td>Iron &amp; Steel</td>
<td>25</td>
<td>20</td>
<td>-5</td>
<td>72</td>
</tr>
<tr>
<td>Holcim</td>
<td>Cement</td>
<td>17</td>
<td>12</td>
<td>-5</td>
<td>72</td>
</tr>
<tr>
<td>Riva Group</td>
<td>Iron &amp; Steel</td>
<td>15</td>
<td>10</td>
<td>-5</td>
<td>72</td>
</tr>
<tr>
<td>Cemex</td>
<td>Cement</td>
<td>14</td>
<td>9</td>
<td>-5</td>
<td>72</td>
</tr>
<tr>
<td>Total</td>
<td>Oil &amp; Gas</td>
<td>27</td>
<td>23</td>
<td>-4</td>
<td>58</td>
</tr>
<tr>
<td>Enel</td>
<td>Power &amp; Heat</td>
<td>72</td>
<td>68</td>
<td>-4</td>
<td>48</td>
</tr>
</tbody>
</table>

### Figure 3: EU ETS companies with highest carbon shortage in 2010

<table>
<thead>
<tr>
<th>Company</th>
<th>Sector</th>
<th>Allocated allowances 2010 (m)</th>
<th>Verified emissions 2010 (mt CO₂)</th>
<th>Emissions to cap (=E-C) 2010 (m)</th>
<th>Potential value of shortage (m Euros)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RWE</td>
<td>Power &amp; Heat</td>
<td>90</td>
<td>144</td>
<td>54</td>
<td>781</td>
</tr>
<tr>
<td>E.ON</td>
<td>Power &amp; Heat</td>
<td>79</td>
<td>95</td>
<td>16</td>
<td>232</td>
</tr>
<tr>
<td>Vattenfall</td>
<td>Power &amp; Heat</td>
<td>60</td>
<td>91</td>
<td>31</td>
<td>449</td>
</tr>
</tbody>
</table>

10 Source emissions data: Carbon Market Data 2011; http://www.carbonmarketdata.com (7); adapted to include value of surplus using 2010 weighted-average EUA price of €14.64.

11 Figures are calculated at group level, taking into account both minority and majority stake holdings in other companies included in the EU emissions trading scheme. Source: Carbon Market Data 2011; http://www.carbonmarketdata.com (8); adapted to include value of shortage using 2010 weighted-average EUA price of €14.64. *Allowances distributed to “new entrants” are not included.
Enel, Italy’s largest power company and Europe’s second largest by installed capacity, makes an interesting exception. The company is an integrated player that is active in both the power and gas sectors. In 2006, Enel emitted 102m tonnes of CO$_2$ in total, which made it the second-biggest emitter in the EU ETS. This left it with a shortage of 19m allowances, which was equivalent to 19m tonnes of CO$_2$ emitted. By 2010, Enel had managed to turn around a 19m tonnes shortage into a 4m tonnes long position. One reason for this turnaround could be the company’s endorsement of the Eurelectric initiative. This requires the 60 participating companies to transform the European electricity sector into a carbon-neutral industry by 2050.

In general, Phase I and II gave the power sector a shortage of allowances and the industrial sectors an oversupply. This does not, however, mean that every company or every installation had a long position. Within the sectors there were also companies that were short. With some companies there were installations that needed to purchase carbon credits. Most of these could likely not pass on the cost of carbon to consumers.

Although the EU ETS has so far had a negligible effect on the bottom line, this could change with the advent of Phase III. The impact of Phase III will depend mostly on the sector targets, the carbon price, and the cost and payback of low-carbon technology.

Some sectors, such as brick manufacturing, will additionally experience increasing costs through the escalating share of auctioning. This does not have to become a competitive disadvantage. The sector will be stimulated to reduce both energy and carbon costs through abatement measures. Companies will study their cost-abatement curves and attempt the most cost-effective options in order to reap the benefits in the medium to longer term through lower energy costs, higher investor ratings and greater consumer interest.

The implementation of carbon regulation is always preceded by intensive industry lobbying and governments tend to be concerned about the competitiveness of their industries. This means it is likely that the California cap-and-trade scheme will see a similar phased development to its European counterpart. In the US, RGGI prices have also been low since its 2009 launch, probably due to a combination of generous allocations and a recession-spurred drop in industrial activity. Californian industry will likely have time to build up its risk management strategy without being seriously impacted financially. In the long run, this may prove to be a competitive advantage over peers in other states.

Systems such as the EU ETS and RGGI have made companies internalize the cost of carbon in their daily business. If the route toward a low-carbon economy is inevitable, businesses will need to accept that, in the longer term, they will have to pay for the full cost of carbon. That means they will need to find out how to combine that full cost perspective with their future growth ambitions.

**Carbon and energy prices**

Cap-and-trade programs such as RGGI in the US and the EU ETS have fed through into higher prices charged by the power sector. Non-utility companies with targets are thus affected directly by their own obligations as well as indirectly by the increase in electricity prices. This means that regulated companies have an additional incentive to reduce their energy costs, and therefore carbon costs.

Energy costs can vary greatly by sector. For the cement sector, for example, the cost may be as high as 50% of the overall production costs.

Energy costs have always been an important reason for efforts to increase efficiency, long before carbon came into play. Even today, with the EU ETS in place, energy costs are still the main driver for abatement of CO$_2$, rather than carbon costs, since carbon prices are too modest at present to encourage serious abatement.

As we have seen, engaging with a low-carbon strategy does not need to have a negative impact on profits. Non-regulated companies will generally implement cheaper measures with faster payback, but they may invest more if they see indirect or longer-term risks or benefits. Leading companies recognize the longer-term benefits of a low-carbon strategy, such as risk mitigation, increasing brand/investor value, influencing consumer behavior, new product/market opportunities, and last but not least, cost savings.

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“Eskom has already incorporated a carbon price in its decision-making process as we expect that future carbon regulations will impact companies globally. We believe that the transition to a low-carbon economy is essential to combat the effects of climate change, and will continue to integrate this process into the many facets of our business. Eskom sees the carbon market as an essential mechanism for leveling the playing field by making technologies more accessible and in turn inviting sustainable investment into developing countries.”

Brian Dames, CEO Eskom
The influence of stakeholders and corporate social responsibility

Policy instruments drive corporations to take action on low-carbon investments. Carbon regulation also raises awareness due to increasing media attention. The idea that the world has started a transition to a low-carbon economy is gradually settling into the mindset of shareholders, investors, consumers and other critical stakeholders. These parties are progressively increasing pressure on managers to act on issues related to climate change. Carbon emissions have therefore become a key component of a company’s CSR strategy.

Investors are starting to benchmark companies on their climate and carbon performance. For many, the extent to which a company engages on these issues is indicative of its broader business strategy and long-term performance profile. This trend will only grow in the coming decade as new carbon regulations emerge around the world. Carbon-constrained companies that are active in cap-and-trade programs will at least have part of the information investors require through obligatory monitoring and verifying of emissions. Other businesses now have to follow suit to sustain favorable ratings.

This trend will not be confined to industrialized nations. Firms in emerging markets will need to start preparing as well, as the shift in economic power from developed nations to the emerging economies accelerates. China and India will be the first countries to catch up, but Latin America and Africa will not be far behind. 13

One important development that is helping investors gather the information they need is the Carbon Disclosure Project (CDP). 14 This is an independent, not-for-profit organization that aims to help companies with their carbon management strategies and provide this information to investors, regulators, and other corporations. It collects data annually from over 3,000 of the world’s largest corporations on their greenhouse gas emissions, climate change strategies, and water usage. It then publishes this information freely. The Global Reporting Initiative (GRI) is another non-governmental organization that stimulates disclosure of climate change actions and data. In contrast to the CDP, the sustainability reporting scope of the GRI is much broader, extending into environmental, economic and social issues. Close to 1,900 organizations published a GRI-based sustainability report in 2010. The CDP and the GRI are currently cooperating to align their questionnaires to improve quality reporting.

Companies in the Global 500, FTSE 350 and S&P 500 are sent a detailed questionnaire annually, which includes questions on their carbon footprint, carbon reduction strategies, offsetting activities and, if applicable, efforts in cap-and-trade programs. 15 At present around 3,050 out of 4,700 invitees participate in the CDP and those companies that do not send a response are noted in the annual reports as having failed to do so. The CDP acts on behalf of 551 institutional investors, who collectively hold US$71t in assets under management. 16

Why is this important? The main impact of the CDP is an enormous awareness boost. The top 500 companies in the world are benchmarking themselves against their peers on climate change and carbon performance. Firms with no mandatory emissions reduction obligations such as Coca-Cola, Aviva, Hewlett Packard, HSBC, ING, IBM, Microsoft, Nike, Nokia and Starbucks have voluntarily set absolute or intensity-based GHG targets for themselves. And the rest of the companies all aspire to reach a similar level to the top 500. Awareness is a vital first step in the process of low-carbon transformation. The CDP thus engages companies in the climate change debate, regardless of whether they are regulated, and stimulates them to develop climate strategies. In addition, a growing number of these multinationals are putting pressure on their suppliers to do the same. 17

Changing consumer attitudes are also steering companies toward superior carbon performance. Firms that are eager to strengthen brand value and competitive advantage are communicating their climate change strategies. Large retail chains address a wide spectrum of sustainability issues, such as recycling, organic products and reducing emissions. Supermarket chain Tesco has set up eco-stores, which emit 70% less than standard ones. 18 Growing demand for low-carbon products brings multiple benefits. Companies can show how green they are while new market opportunities present themselves. A converse benefit also occurs, where companies can influence consumer behavior toward purchasing green products.

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13 The Economist, The World Economy – a game of catch-up; September 2011.
14 https://www.cdproject.net
15 More than 60% of the European companies participating in the CDP do not have obligations under the EU ETS.
16 Carbon Disclosure Project; https://www.cdproject.net
17 Carbon Disclosure Project; Supply Chain report 2011.
18 Confronting Climate Risk, Environmental Finance; October 2010.
Risks and opportunities

Climate change exposes companies to a wide variety of risks. As new carbon policies pop up around the globe, they face regulatory risk from non-compliance. Reputational risk is also a major issue, with both regulated and non-regulated companies potentially jeopardizing their brand by not acting quickly enough to mitigate exposures. In the longer term, extreme weather may disrupt supply chains and damage physical assets. Sourcing may become problematic, and water scarcity could increase costs and interfere with manufacturing. Dealing with these risks will require advanced risk management capabilities, in addition to robust models that encompass the various threats to which a company is exposed.

The private sector can attempt to mitigate climate change risk by engaging with low-carbon development. But it can also do much more. Companies can lobby the authorities for climate regulation and exert influence on their supply chain to improve its performance. Typically, more than 50% of an average company’s emissions are derived from its supply chain. It therefore makes sense for a firm to include the supply chain in its carbon management strategy. Potential actions include redesigning products, reducing demand for carbon-intensive purchases, working collaboratively with suppliers to cut emissions, and making effective carbon management a supplier selection criterion. For example, last year Walmart decided to commit voluntarily to reducing 20m tonnes of GHG from its supply chain. Over 50 other multinationals including corporations as diverse as Unilever, Nestlé, Philips, Rolls-Royce, Endesa, BT Group, Vodafone, Ford, Google, PepsiCo, Bank of America, Dell and Barclays are also actively pursuing a low-carbon supply chain, and the majority of these firms have set GHG targets for themselves.

At the same time, these risks present numerous opportunities for companies in all sectors that are willing to go beyond cost saving. Changing consumer behavior and regulations may stimulate new product development and open up new markets. Adaptation to the physical impact of global warming will require the development of new services, products and investments. There will also be opportunities to offer differentiated low-carbon products to the market. Companies that are proactive about these longer-term opportunities will be the first to create value from them and secure a strategic advantage.

Conclusion

Most business leaders are incorporating climate change risk and the cost of carbon into their business strategy. Regulated companies generally outperform non-regulated firms on carbon performance. At present, however, both sides are mainly taking advantage of inexpensive emission reduction measures.

In the longer term, companies need to prepare for a low-carbon, or carbon-constrained, economy. This process will occur incrementally. Techniques to monitor and report GHG emissions and carbon management strategies are improving year on year, as is our understanding of the impact of risks and opportunities related to climate change.

The response so far is thus an important development in terms of risk management and value creation. But in time, these strategies will need to be scaled up to incorporate the full cost of carbon. The challenge will be to make sustainable growth compatible with business models. Eventually, some businesses may need to ask themselves if their company actually fits in a low-carbon economy. Ultimately, this will separate the winners from the losers.

19 Carbon Disclosure Project; Supply Chain report 2011.
20 Carbon Disclosure Project; Supply Chain report 2011.
22 Carbon Disclosure Project; Supply Chain report 2011.
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