

Emission critical

Connecting carbon and value
strategies in utilities*

*connectedthinking

PRICEWATERHOUSECOOPERS 

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Make the value connection
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Methodology

Emission critical includes data from the PricewaterhouseCoopers' report *Global Utilities Insight 2004*. Analysis presented is based on research conducted between December 2003 and March 2004. Research covered the four major regions of the Americas, Europe, Middle East and Africa and Asia-Pacific. Within Europe, a total of 75 respondents answered region-specific questions on topics which included emissions trading. These responses are presented in *Emission critical*.

Introduction

Investors and financial institutions across the globe are becoming increasingly alert to climate change risk. Utility companies, as leading emitters of greenhouse gases, are in the frontline. In Europe the 'Emissions Trading Directive' will create the world's largest emissions trading regime, generating new assets and liabilities worth tens of billions of euros, and presenting new and unique challenges for utility company leaders.

Views on the impact of the European Union Emissions Trading Scheme (EU-ETS) vary widely, not least because of uncertainties about the allocation rules and the future trends of prices for both carbon and electricity. But one thing is clear: climate change will be a key driver of corporate value. The effectiveness of a company's carbon strategy will become a key metric in investor decision-making. Already carbon risks are a focus of analysts and credit rating agencies. Early strategic planning, market leadership and effective management are vital. Companies that do not rise to this challenge place their shareholder value and, potentially, their independence at risk.

Companies should already be a long way down the road of running scenario analyses and implementing the necessary internal reforms. These need to span the full range of activities within the organisation: from operations and trading to merger and acquisitions strategy and investment planning; from legal and environmental compliance to tax and accounting. Yet our research shows that only a minority of European utility companies have a strategy for climate change in place and fully operational, and many utilities have no climate change strategy at all.

Utility companies need to demonstrate that they have clear plans in place to exploit the shareholder value opportunities of the emissions trading schemes, as well as showing that they are able to manage the compliance aspects. To thrive in this new world, companies must ensure they have a strong connection between emissions trading and their value strategy.



Manfred Wiegand
Global Utilities Leader



Richard Gledhill
Corporate Finance Leader, Global Energy and Utilities

Report highlights

The pace of regulatory action to curb emissions is intensifying around the world. Utility companies need to prepare quickly for the introduction of 'cap and trade' schemes in the EU, Japan and Canada. In the US and Australia, other emission limitation schemes are impacting on the energy market.

Many utility companies have failed to take the key steps to equip themselves for the new environment. Fewer than one in five of the European companies questioned in our *Global Utilities Insight 2004* has a strategy for climate change and emissions trading in place and fully operational. Even more worryingly, one in five said they had no climate change strategy at all. Progress is even slower in other markets. Only one in eight of the American companies surveyed, for example, has fully implemented a climate change strategy.

Achieving the value connection will depend heavily on reorienting the company in advance of the market changes, embedding carbon in both strategy and processes across the organisation and managing crucial regulatory relationships and processes.

Two-thirds of companies in the EU expect wholesale electricity prices to rise by up to 20 per cent and a fifth of companies expect increases of 20-40 per cent. However, the sector is split over the extent to which these increases can be passed on to customers. This suggests that retail margins may be squeezed and that integrated utilities may benefit less from the EU-ETS.





Failure to implement and communicate an effective strategy on emissions trading and wider climate change issues could jeopardise utility company shareholder value. Utility leaders are in no doubt of the value connection. Fifty-four per cent of European survey respondents believe that emissions trading will enhance their company's shareholder value in the long-term and 49 per cent foresee a beneficial effect on long-term profitability. In both instances, this is more than twice the proportion of companies expecting a detrimental long-term impact.

The European Commission has predicted a significant shift from coal and oil fired generation in Europe to gas and renewables over the next decade, in part as a result of the EU-ETS. Nonetheless, set against increases in supply and demand, the sector could be structurally short of around 100Mt CO₂/y by 2012. This would leave many players dependent on securing CO₂ credits from outside the EU. The extent and speed of any shift in fuel mix is likely to be a major driver of future prices of allowances and credits and will have important implications for investment funding and tariffs.

Utility companies should be leading players in emissions trading markets, but the race is on for them to demonstrate that they have the right strategies to deliver results. Surprisingly, nearly half of the European utilities we surveyed said it was too early to tell if they would be trading. With time running short, we review the practical changes that companies will need to implement to manage value and risk in this new environment.

Carbon countdown

“Reducing the level of greenhouse gases in the atmosphere, particularly the level of carbon dioxide (CO₂), is one of the greatest challenges of our times.”

E.ON, from E.ON Kernkraft
www.eon-kernkraft.com

“There is the potential for many challenges and problems. But make no mistake, this will be a one way street. The parameters of change will reach far beyond a shift in the fuel mix.”

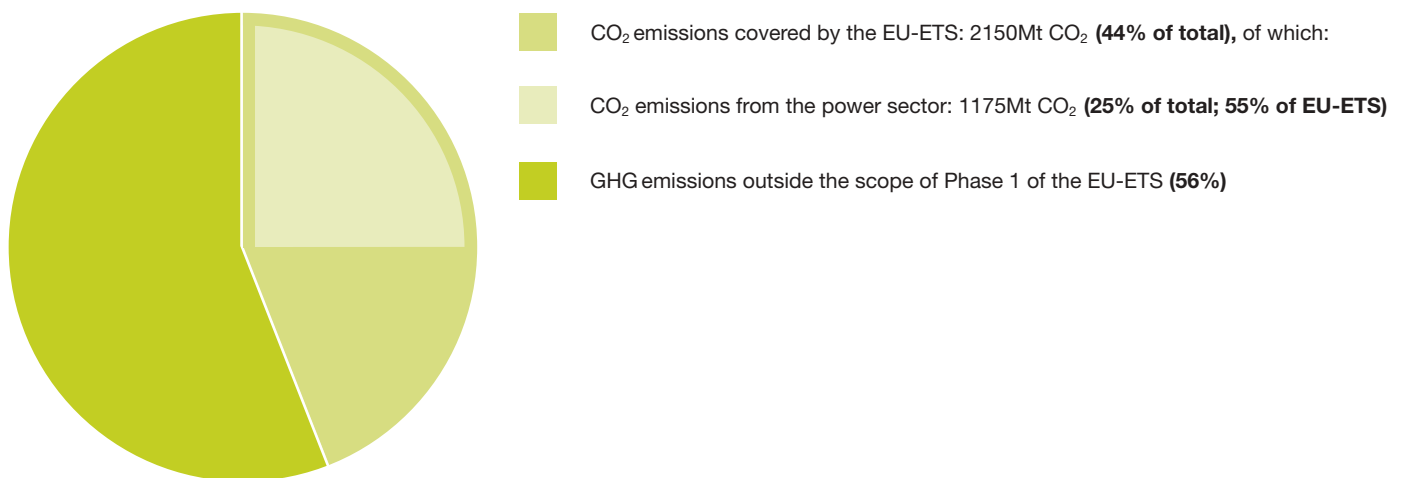
Richard Gledhill, Corporate Finance Leader, Global Energy and Utilities



Across the globe the countdown is on for utility companies to deliver effective climate change strategies, to manage new risks and to create or preserve value in a changing environmental context.

In Europe, New Year's Day 2005 will herald the start of a CO₂ cap-and-trade scheme in the EU25¹ that will cover more than 12,000 installations in five different industrial sectors. It is the first multilateral trading scheme of its kind and power generation will be at the forefront – the power sector accounts for 55 per cent of the emissions covered by the EU Directive.

Figure 1: **Greenhouse gases (GHG) emissions in the EU25** (Total GHG emissions = 4850Mt CO₂ equivalent)



Source: European Environment Agency, Eurelectric, European Commission

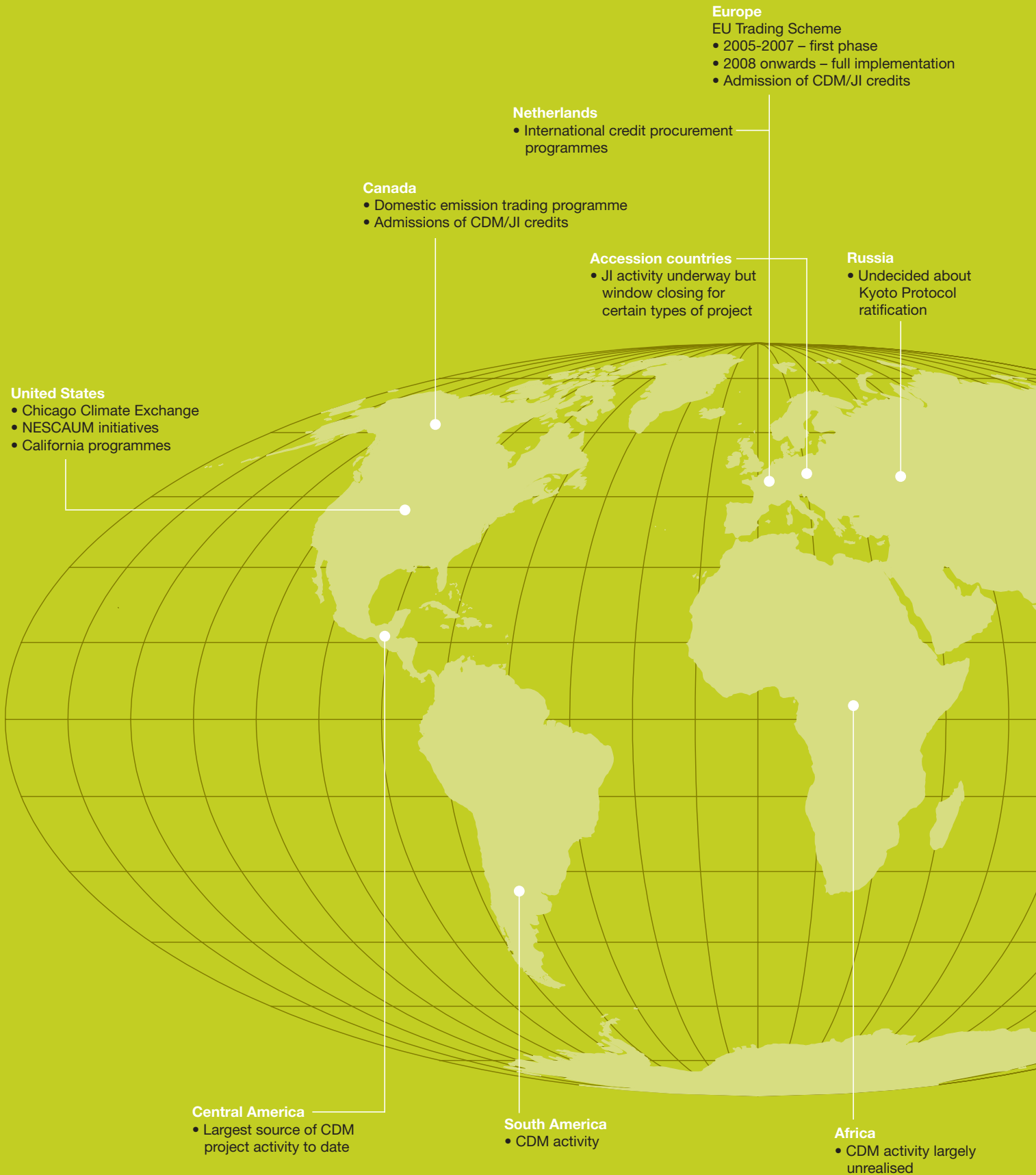
Yet, despite their exposure, the boards of many utility companies appear to have been slow at integrating the consequences of climate change into their business strategy. The results of our *Global Utilities Insight 2004* report show that less than one in five European utility companies has a strategy in place to address the implications of climate change and emissions trading. Two-fifths of those surveyed are still developing their strategies and one in five has no strategy at all.

Progress is even slower in other markets. Only one in eight of the US companies surveyed, for example, has a climate change strategy in place.

Clearly any strategy needs to be responsive to regulatory and market developments and over the next few months many of the uncertainties in relation to the Emissions Trading Scheme in the EU will become clearer. However time is running out for a proactive strategy.

¹EU25 refers to current European Union (EU) member states and accession countries

Figure 2: The global emissions trading map



Note:
CDM – Clean Development Mechanism
JI – Joint Implementation
NESCAUM – North-East States for Coordinated Air Use Management

Source: PricewaterhouseCoopers, *Emission critical*, 2004

The carbon clampdown

Governments around the world are introducing compliance measures that limit CO₂ emissions. The EU25, Canada and Japan have all ratified the Kyoto Protocol and are developing emissions trading frameworks and other incentives to encourage clean power generation technologies.

Even in the US and Australia, where the federal governments have turned away from Kyoto ratification, GHGs are beginning to be addressed at a state level. In the US at least 15 states have passed legislation or have policies to address CO₂ emissions under consideration. In Australia, the state-based New South Wales (NSW) GHG Abatement Scheme, which imposes mandatory GHG benchmarks on all NSW electricity retailers, began on 1 January 2003.

Despite the absence of mandatory legislative measures, companies are making voluntary moves to establish trading-based emission reduction mechanisms. The Chicago Climate Exchange (CCX) is a pilot GHG cap-and-trade system in which a group of North American companies has voluntarily agreed to reduce GHG emissions by four per cent below the average of their 1998-2001 baseline by 2006.

Developing countries are already taking advantage of the opportunities to develop projects under the CDM. To date, South and Central America have dominated the market, but India and China are emerging as major players. The CDM has facilitated direct investment, technology transfer and wider sustainable development benefits.



Stakeholder warnings

A key driving force behind the various initiatives is, of course, the Kyoto Protocol. In the absence of ratification by either the US or Russia, the requirement on governments to meet Kyoto targets is voluntary rather than mandatory. While the US has set its face against ratification, Russia had indicated that it would ratify.

However, this signal has been followed by equivocation and Russian movement forward on Kyoto has inevitably become entangled with wider international negotiations.

Whether or not Russia ratifies the Protocol, the momentum towards the reduction of CO₂ emissions is clear. Even without full implementation, regional carbon trading markets are being established which will connect on a bilateral basis. The full implementation of Kyoto would create an international level playing field and set the seal on the development of what would ultimately become a global market in CO₂ allowances.

Stakeholder momentum is prompting companies to be much more proactive in considering their GHG opportunities, risks and exposure. Representatives of leading institutional investors in the US, for example, have initiated an 'Investor Network on Climate Risk' calling for better disclosure of climate change risk. The Network has launched a 10-point plan calling on the Securities and Exchange Commission to force companies to disclose how climate change could affect them and to require investment managers to factor climate risk into their recommendations. Such moves are being conducted against a growing concern that climate change could pose litigation threats comparable to those launched against the asbestos, tobacco and fast food industries.

On a wider, global scale the Carbon Disclosure Project represents 87 institutional investors with assets of over U\$9 trillion under management. The group gathers information from the 500 largest companies in the world by market capitalisation. Its goal is open disclosure of investment-relevant information concerning companies' greenhouse gas emissions to assist investor risk evaluation. As Paul Dickinson, project coordinator, points out "there are potential business risks and opportunities related to actions stemming from climate change that have implications for the value of shareholdings in corporations worldwide. Examples of such actions are political and regulatory momentum moving against significant carbon emitters; emissions-sensitive technologies, products and services superseding those existing today; and shifts in consumer sentiment due to a corporation's stance on climate change" (Press release, 1 November 2003, *Carbon Disclosure Project*).

CO₂ on the US Senate agenda

The US Government's Clear Skies initiative opts for a 3-P (three-pollutant) power plant clean-up programme rather than a four-pollutant plan that includes carbon dioxide. However, signals from the Senate suggest that the political will to deliver a CO₂ cap-and-trade scheme in the US may not be too far distant. The McCain-Lieberman Climate Stewardship Act, which would create an emissions trading scheme, secured the support of 43 senators in a 55-43 vote in November 2003. The vote was sufficient to indicate that further moves to introduce such a policy shift may bear fruit in the future.

Australian coal tailings-fired plant application refused

In October 2003 the New South Wales (NSW) Government announced Australia's first power station rejection due to GHG concerns. In refusing permission for the proposed Redbank 2 coal tailings-fired generation plant using waste fuel from existing generation plants in the Hunter Valley, Craig Knowles, the NSW Infrastructure and Planning Minister, sent a clear message to power generators: "Climate change is real. Greenhouse impacts are real. Our droughts are now drier, hotter and longer than ever. We have an obligation not only to ourselves but also to future generations to be vigilant when it comes to saying no to proposals that do not reflect opportunities for improvement." (NSW Legislative Assembly Hansard, 14 October 2003.) The proponent of Redbank 2 generation plant has appealed the refusal in the Land and Environment Court of NSW.

The EU-ETS is sharpening the focus on investment and credit risk arising from CO₂ emissions. Ratings agencies have become alert to the potential credit-negative risks of the scheme. Similarly, investment bank analysts have been busy trying to analyse the impact of the EU directive on individual companies. Carbon risk is fast becoming part of the currency of analyst and investor scenario planning and dialogue. However, views on forward curves for carbon and the implications for power prices and margins vary widely. The onus is on companies to communicate that they have fully evaluated the impact of the Directive on their operations and developed an effective strategy to maximise value and/or minimise exposure in these new conditions.

Hollywood delivers a climate change apocalypse now

Hollywood is set to launch a climate change disaster movie onto cinema and living room screens worldwide. With the weight of Twentieth Century Fox behind it, *The Day After Tomorrow* takes a big-budget, special-effects-filled look at what the world might be like if the greenhouse effect and global warming reached catastrophic levels. When Oliver Stone made the movie *JFK* the ensuing public debate spurred special enquiries and hearings that spanned the best part of a decade. As severe weather events such as flood, hurricane and drought become more commonplace, *The Day After Tomorrow* may act as a spur to consumer awareness and political scrutiny of GHG emissions.



Image courtesy of Twentieth Century Fox Film. Twentieth Century Fox nor anyone involved in the production of this film endorse any of the views expressed in this document.

Countdown challenges

The ultimate stakeholder is the consumer. Green consumer trends have been with us for some time but have yet to mature into the mainstream market orthodoxy. The direction of consumer change, though, is set and its momentum is likely to build if severe weather events continue to increase in frequency. This momentum is underlined by the decision of a leading Hollywood studio to cast climate change as the next disaster movie scenario and entertainment figures such as the Rolling Stones to declare their concerts 'carbon neutral'. Similarly, the travel industry is increasingly giving customers the option of paying a premium to offset emissions from their holiday flights.

Green energy options have become an established part of the utility company product mix. The development of the EU-ETS, and the accompanying media and non-governmental organisation (NGO) focus on the level of emissions, will itself stimulate increased consumer awareness of their supplier's emissions track record. At the same time it will help to offset the extra cost of green energy alternatives. The opportunity for energy companies to position themselves in the future energy market as a provider and manager of clean energy solutions, with services such as energy management, dispersed self-generation, sustainable energy solutions and carbon compensation products, is significant.

In Europe, the timetable set by EU legislators is demanding, both for regulators and for the market. Directive 2003-87 sets the overall framework for emissions allowance trading but it is for the individual national states to translate it into national law and, crucially, to draw up plans for how allowances are to be allocated to individual installations. By the end of Summer 2004 each country will have submitted its national allocation plan to the EU and these will have been scrutinised to check for State Aid Rule infringements and coherence with Kyoto and EU Directive targets. The success of governments and the European Commission in arriving at a transparent, objective and clear process for allocations will be fundamental to the future success of the scheme.

It's only rock and roll but we like it carbon neutral

The Rolling Stones have joined the list of those seeking to counter the impact of their activities on carbon emissions. Nine UK dates on their 2003/4 Licks world tour were promoted as CarbonNeutral™ by planting natural forests to offset the carbon dioxide emissions from the concerts. Opinions vary on the effectiveness of woodland carbon sinks. But the move is significant both for its high profile and for the decision to address the impact of emissions even in a consumer market context where the audience is already intensely loyal.

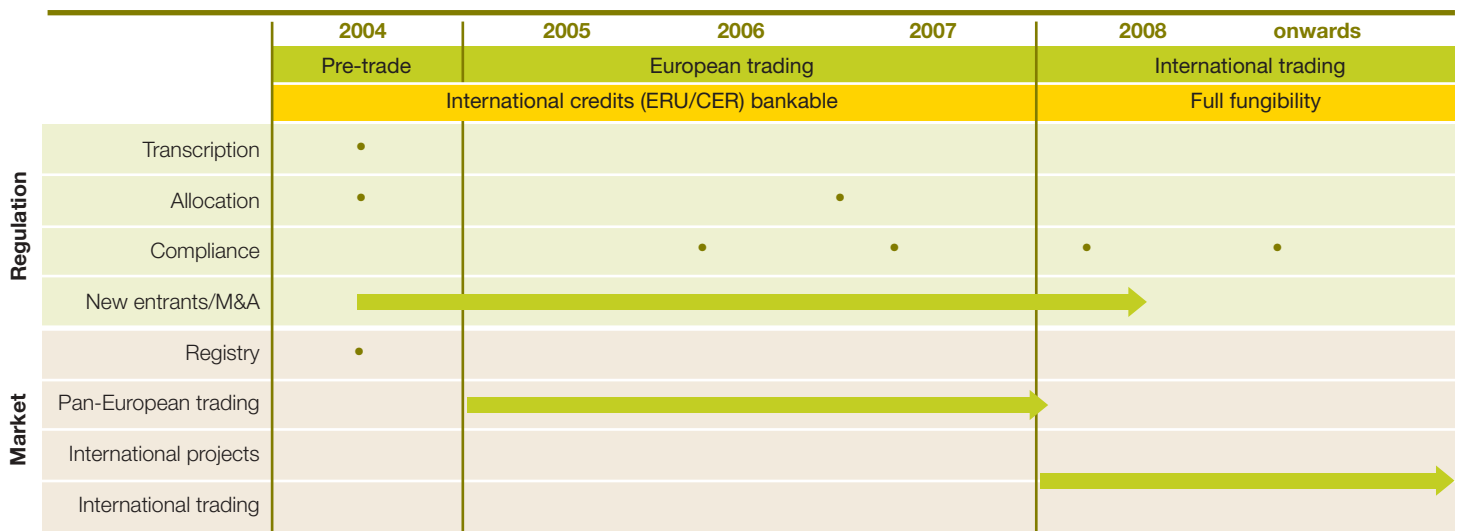
The EU Emissions Trading Scheme

The EU's ratification of the Kyoto Protocol requires total emissions of greenhouse gases to fall to 92 per cent of their 1990 levels in the period between 2008 and 2012. The introduction of emissions trading is a key EU policy response to this challenge. Together with companies in four other sectors (refineries, ferrous metals, pulp and paper, and building materials), power generators will be subject to a 'cap-and-trade' system of emissions control.

Allowances will be determined by national government allocations across the EU (initially based on historical CO₂ emissions but, after 2008, the scheme will be extended to cover the other five greenhouse gases). These will be freely transferable between companies or tradable on the open market, with the objective of incentivising lower cost emissions abatement.

The method of allocating emission rights will be extremely important in determining the net financial impact on companies. It will also play a part in shaping strategy and tactics. The initial consultative documents from individual governments suggest that there may be significant differences between states, which will present arbitrage opportunities for companies. In particular, the treatment of new entrants seems to differ between the UK and Germany.

Figure 3: The EU emissions trading timeline



Source: PricewaterhouseCoopers, *Emission critical*, 2004

A three-year first phase, from 2005 to 2007, is designed to embed the scheme ahead of full implementation, scheduled to coincide with the Kyoto target period of 2008-2012. Failure to cover emissions with allowances will lead to fines of €40 per tonne of CO₂ in the first phase, rising to €100 per tonne from 2008. As well as incurring fines, companies will still be required to purchase emissions rights in the ensuing period to cover the shortfall. The possibility of carrying over excess allowances from 2007 (the end of the first phase) to 2008 (the beginning of the next) is currently under discussion, but is likely to be forbidden (as proposed under the draft UK and German national allocation plans), or at least restricted.

Companies will be able to use emission-based credits flowing from so-called Kyoto Protocol Flexible Mechanisms - ERU (Emission Reduction Units) from Joint Implementation (JI) and CER (Certified Emission Reductions) from Clean Development Mechanism (CDM). In this way, emission reductions achieved through approved projects in developing countries can be used to meet EU obligations up to a certain limit.

The original EU thinking was that these JI/CDM credits could be used in the second phase of the scheme, from 2008 onwards. But the European Parliament has signalled that it may favour allowing them to be linked from 2005. A decision on this is expected later this year.

Each country will need to establish a national registry of allocations and develop the necessary legal codes while, at the EU level, a pan-European hub needs to be established, ensuring a smooth link between national registries for intra-European transactions.

Allowances must be distributed free, although governments have the ability to auction five per cent in the first phase of the scheme and 10 per cent in the second phase. For the first phase, it seems unlikely that auctioning will be widely adopted.

Carbon consequences

“Vattenfall estimates that an allowance cost of 5 €/tonne will add 2-3 €/MWh to the price of electricity and 10 €/tonne will add 4-6 €/MWh. Higher prices of allowances will obviously increase electricity prices further, but there will then probably be changes in demand growth.”

Vattenfall, Electricity Market Report 2003

“Gas is ‘the great game’ in energy because consumers want it for health and environmental reasons, businesses want it as a source of new wealth, and the growth of fuel cells relies on it... In contrast to oil, with its declining attractiveness, gas – seen as a clean, low-cost source of power – is clearly the fuel of the new century. An important aspect of the growth of gas demand is the success of industrial CO₂ trading systems.”

Shell, People and connections: global scenarios to 2020, 2002



The new emissions allowance trading market will become a fundamental influence: not only on value in the European utilities market, but also on non-European commodities exporters to Europe. In the long run, advantage will transfer from 'carbon intensive' to 'carbon light' entities. The shorter term will be less clear cut. Emissions allowance trading will interact with initial allowance allocations and other key influences, such as energy demand, wholesale prices, retail regulation and weather, creating complex implications for profitability and value.

Market forces

An immediate consequence of the introduction of emissions trading will be a significant shift in the merit-order scheduling of electricity generation plant in many countries. Looking further forward, the carbon-constrained economy will enhance the position of gas as the new-build fuel of choice and should also encourage the further penetration of renewable technologies.

Carbon emissions trading is not the only driver for change. In particular, the interaction of the Large Combustion Plant Directive with carbon pricing will be an important factor in the economics of large coal fired plant. However the pace of new investment in gas and other cleaner technologies will depend on longer-term perspectives on fuel spreads and carbon prices, as well as the relative capital costs of new technologies, regulatory developments and lead-times for planning and construction.

These issues will also influence wider structural changes in energy markets. The increasing dependence on imported gas is generating growing concerns about the fuel balance and security of supply, and is already encouraging a re-examination of the nuclear power option in a number of countries. At the same time, technological changes, allied to higher grid prices, may act as a catalyst for the further development of decentralised, distributed generation. Greater end-user autonomy would also help mitigate security of supply risk.

Meanwhile, demand for electricity is forecast to grow steadily – with a cumulative increase of 55 per cent in the EU25 over the period 2000-2030 (Source: European Commission, 2004). The implications for both policymakers and utilities companies will be complex, but perspectives on the longer-term political commitment to the Kyoto process and the role of emissions trading as a policy instrument will soon need to be developed.

These changes in supply and demand parameters point towards increasing wholesale electricity prices in Europe. Forecasts of the overall impact of the EU-ETS on electricity prices vary and will depend strongly on the inter-play of allowance allocations, energy demand and volatility in carbon prices. The consensus among industry commentators, however, suggests that both wholesale and retail electricity prices will rise following the introduction of a carbon constraint.

For example, 66 per cent of European company respondents surveyed in our *Global Utility Insight 2004* expect wholesale electricity prices to rise by up to 20 per cent as a direct result of the EU-ETS and a further fifth of respondents forecast an increase of between 20 and 40 per cent. Half of the utility company leaders are confident that wholesale price increases will be largely passed on to the end customer. Others are more cautious, perhaps anticipating government or regulatory resistance to fully pass on the increase to retail prices in some countries.

It is difficult to imagine regulators being entirely passive in the face of heavy price increases. Utility companies will need to be ready to judge and manage the regulatory relationship and be able to demonstrate that price rises are linked to a shift to cleaner technologies. How far regulators stick to the 'polluter pays' principle will be a key factor in determining the net financial impact on companies.

Market drivers

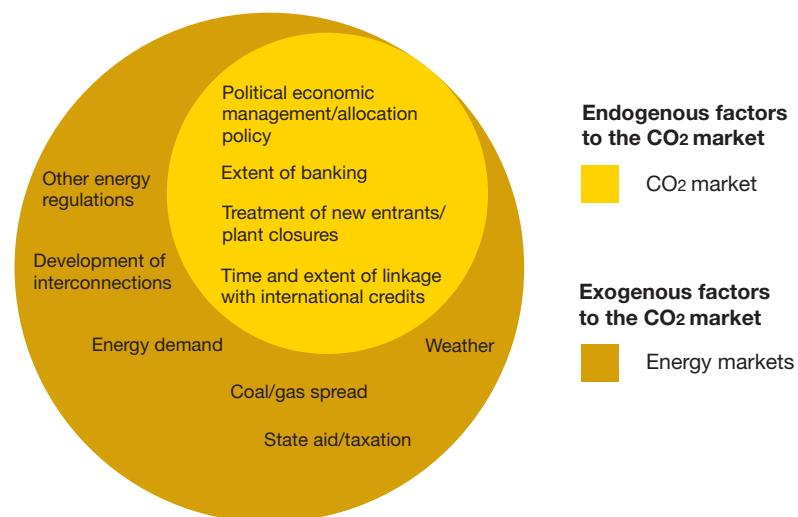
A range of factors will shape the type of emissions allowance trading market that emerges (see figure 4), some exogenous, others endogenous, to the market. For example, the coal/gas spread will be critical, and hedging between this spread and the CO₂ price is likely to be an important component of any emissions allowance trading strategy.

Weather conditions will play an even more vital role in utility planning and carbon strategy. The impact of weather can be seen in the experiences of Iberian utility companies during 2002. Drought reduced hydropower output and forced generators to depend more on coal. As a result, carbon factors² rose 64 per cent for Iberdrola and 22 per cent for Union Fenosa (Source: *European Carbon Factor 2003*, PricewaterhouseCoopers/Enerpresse).

The scope for the carbon market to embrace the characteristics of a financial trading market is considerable. The advent of emissions allowance trading will provide a further spur to the development of derivatives based around the weather and fuel spread risks. Certainly the geographic scope and volume of participants is sufficient for a liquid marketplace to emerge that moves beyond compliance activity to more dynamic trading.

How quickly, and how far such a market emerges, hinges on a set of uncertainties. The prospect of a relatively benign opening allocation in phase one, together with the non-availability of large international streams of CO₂ credits, may mean the market stays short for a considerable period. This could be exacerbated if players seek to 'bank' allowances for use in future years. However, banking between 2007 and 2008 is likely to be restricted by regulators and the eventual rules on this will play an important part in determining the liquidity of the market and the level of prices. Prohibition could drive prices down towards zero by the end of 2007 if the market is long, or push them up if it is short.

Figure 4: **Market drivers for emissions allowance trading**



Source: PricewaterhouseCoopers, *Emission critical*, 2004

²Carbon factors² are emissions divided by generation expressed in kg CO₂/MWh.

Early signals

Even ahead of the exact rules of the EU-ETS being known, trading of allowances has already begun. Not surprisingly, this pre-compliance trading has been thin, as companies use relatively low volume trades to gain experience in the market, frame agreements with counterparties and test their internal systems. The trend so far has been an upward drift in bid-offer spreads, with prices nearly doubling from €6/t CO₂ in Spring 2003 to more than €12/t CO₂ in Winter 2003. However these initial figures relate to a very illiquid market, with less than 50,000t CO₂ allowances traded every week.

Once national allocation plans and compliance rules become clearer, the market is likely to witness greater trading activity and experience genuine price discovery. Certainly the response of European utility leaders to our *Global Utilities Insight 2004* report indicates that there will be a significant number of companies seeking to trade in the new market. Nearly half said that it was too early to tell, but 32 per cent of respondents felt confident enough to say that they would definitely be an 'active trader participant' in the marketplace. Among our respondents the number of companies expecting to be net buyers significantly outstripped net sellers.

New risks

The EU-ETS will deliver a new layer of factors to integrate into utility company risk evaluation frameworks. Ahead of the scheme's implementation companies have to manage the risk associated with uncertainties around allocations and market arrangements. They should also be factoring in the implications for investment and M&A activity, as well as equipping themselves for the ongoing risks that they will face in connection with trading, compliance, monitoring and settlement. The risk framework for emissions trading will also need to be sensitive to the possibility of 'shock risks' such as grid crises, extreme weather conditions, market shortage or government intervention.

Emissions trading will pose direct and dramatic consequences for the strategic positioning and asset portfolio management of individual companies. The critical influences for utility companies include the CO₂ emission intensity of current generation, the company's geographical footprint (since allocation policies will vary according to countries' different Kyoto burden-sharing agreements and the impact on power prices will depend also on the regional fuel mix and the degree of interconnectivity with other power markets), vulnerability to weather risk, access to clean power financial incentives, and the balance between marginal abatement costs and the cost of purchasing new emissions allowances.

Shifts will take place in the configuration and structure of energy production. Even in scenarios where companies get allocations that protect their high emitting installations, there will be incentives to change the configuration of these installations and the new merit order will affect investment plans. Different pricing points will have an impact on the strategic fuel mix decision. A switch from coal to gas, for example, could reduce the cost of emissions by €5/MWh (assuming 500kgCO₂/MWh@€10/t CO₂). At the opposite end of the spectrum, a dry season forcing the substitution of coal for hydro could create an additional €9/MWh cost.

Factoring carbon into investment decisions, however, will not be straightforward, with uncertainties as to allocations from 2008 and the whole climate regime beyond 2012. The interaction between carbon, fuel choice and electricity prices will be complex.

Variations in national rules for new entrants and plant closures and the potential for gaming in relation to future allowances (the timing of reductions may impact future allocations) add further layers of complexity.

Fuel mix scenarios published by the European Commission in 2003 predict a progressive shift to gas-fired generation over the next twenty years (see Figure 5). With nuclear decommissioning programmes already underway and continued political reluctance to build new plant in many countries, the share of electricity generated from nuclear is predicted to fall from 32 per cent in 2000 to 28 per cent in 2010 and 21 per cent in 2020. Projections of electricity production from solid fuels show a similar decline over the same period, reflecting the implementation of the Large Combustion Plant Directive and fuel switching driven by the EU-ETS regime. In their place, natural gas becomes the base-load generation fuel of choice. The share of gas is projected to increase from 16 per cent in 2000 to more than 31 per cent in 2010 and 38 per cent in 2020.

Despite the aggressive penetration of renewable technologies in European markets in the last 10 years, the European Commission's projections reflect mixed prospects, with wind continuing to grow, but at a decreasing rate, and hydro generation showing a gradually declining share of total generation. The contribution of renewables overall stabilises at around 17 per cent after 2010.

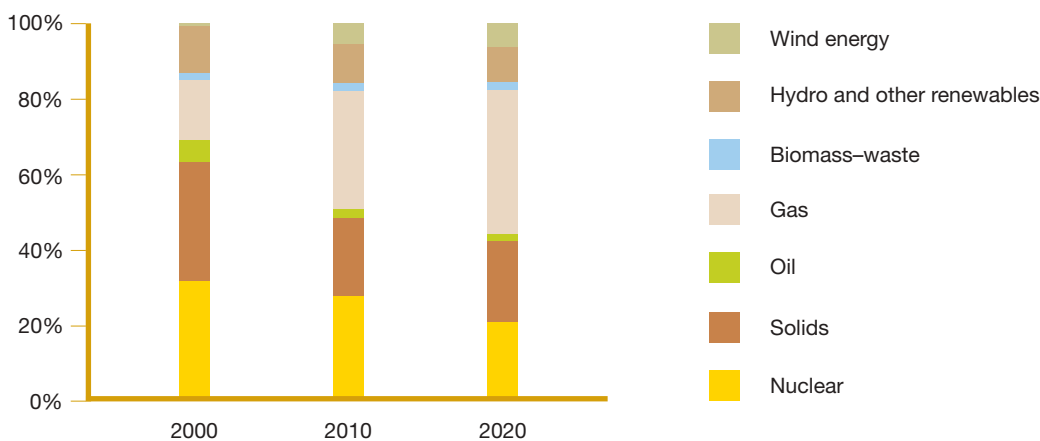
In our survey we asked European utility leaders to predict the change in their companies' future fuel mixes over the next ten years. The results are consistent with a shift to gas and renewables, though the responses suggested that the extent of the shift within this time frame might be less significant than forecast by the European Commission.

How quickly fuel switching happens will depend on views on the longer-term prospects for CO₂ and fuel prices, as well as more immediate issues such as the switching rules in the EU-ETS and the interaction with the Large Combustion Plant Directive. Investment in generation is a thirty-year commitment, with a lengthy lead-time for permitting and construction. So perspectives on the longer-term political commitment to emissions trading and Kyoto will be a key consideration.

The extent of fuel switching will in turn be a key driver of the price of carbon. A new 'dash for gas' would drive down CO₂ prices, whilst more of a 'wait-and-see' approach across Europe could contribute to significant price increases.

These issues and interrelationships add a vital new complexity to investment planning. Investment decisions, acquisition strategies and risk management tools will need to be underpinned by scenario analysis on several, different dimensions.

Figure 5: Projected changes in electricity generation for the EU25



Source: European Commission (2003). *European Energy and Transport Trends to 2030. DG-Energy and Transport, Brussels.*

Under this scenario, emissions for the power sector in 2010 would be roughly at 2000 levels (around 1,200Mt CO₂ per year). On this basis, we calculate that the power sector might be structurally short by some 100Mt CO₂ per year by the end of the second phase of the EU-ETS, assuming full implementation of Kyoto targets. This would require the sourcing of additional emission reductions from other industrial sectors in Europe or through projects under the Flexible Mechanisms of JI and the CDM.

New opportunities

Emissions allowance trading presents European utility companies with some unique opportunities. Many have developed significant energy trading expertise and are already establishing a track record and experience in early emissions trading. At the same time, some of the capabilities that will be important in the new market, such as managing weather risk and real time forecasting of supply and demand, are already integral to the utility skill set.

Power generators know their emissions a day ahead, which gives them opportunities to intervene on the market before counterparties are aware of any imbalance. These factors argue for a more proactive trading strategy to deliver value beyond mere compliance. In turn, this will have competitive implications for companies in the rest of the sector.

Underpinning these trading advantages, utility companies appear to be in a better position than companies in other sectors to pass the cost of carbon on to their end-customers though, as we have noted, their success in doing so will depend on regulatory considerations. An important part of this equation will be the extent to which governments are prepared to view higher retail prices as a key component of their climate control strategy.

Higher prices provide an incentive for energy efficiency. The extent to which utility companies are successful in persuading regulators to stand aside from intervention may rest in part on how far they can become active players in promoting energy management, conservation and sustainability.

The top 10 European utility companies will be in a particularly strong 'market-making' position since they will control more than 30 per cent of all EU allowances allocated. By contrast the remaining 70 per cent will be allocated to more than 5,000 companies, the vast majority of whom have a single installation and no trading capabilities.

It is clear that many European companies recognise that the EU-ETS will pose significant strategic and financial opportunities, as well as challenges. More than half (54 per cent) of the European survey respondents in our *Global Utilities Insight 2004* believe that the EU-ETS will enhance their company's shareholder value in the long-term and 49 per cent foresee a beneficial effect on long-term profitability. In both instances, this is more than twice the proportion of companies expecting a detrimental long-term impact. Respondents were more evenly divided on the short-term effects, although few anticipated negative effects on shareholder value, even as a one-off.

The value opportunity will vary, depending on location, fuel mix and strategy. For example, a squeeze on retail margins could offset some of the benefit of increased wholesale prices for integrated players and may be detrimental to some.

These issues go to the heart of corporate strategy, investment decisions and shareholder value.

Carbon ready

“To meet climate protection standards, over the next few years RWE will: increase the energy efficiency of its power plant facilities through expansion and modernisation; expand current output using renewable energy sources; bring to market innovative solutions such as fuel cells and continue to develop a distributed energy supply system based on cogeneration.”

RWE, Commitment to preventing climate change, www.rwe.com

“The development of the market may take some time. We won’t be surprised to see companies sitting on allowances; but ultimately too many players, both companies and regulators, have an interest in seeing liquidity emerge for this to last for long.”

Laurent Segalen, Head of Climate Change Services,
PricewaterhouseCoopers



Companies both within and outside the EU need to be integrating strategies, systems and skills across their companies to meet the challenge and opportunities of emissions trading. In this chapter we examine the practical changes that will be necessary inside utility companies. Those that succeed in reforming and refocusing early will be well placed to secure significant, first-mover advantage.

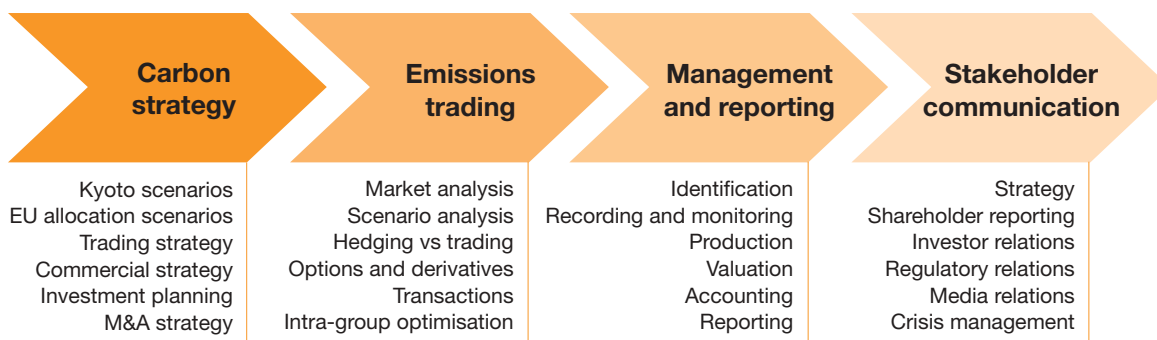
Set a strategic lead

Early planning and preparation, both strategically and operationally, is vital. Yet, as we have seen, nearly half of European utility leaders that we surveyed are not yet confident enough to say whether they will be active traders in the allowance market and a significant minority does not yet have a strategy for climate change. Companies may be holding back because of inevitable uncertainty over the rules of the game and the outlook for carbon prices. However, whether the CO₂ price is €5, €15, or €25 per tonne, the practical issues facing companies, and many of the strategic thought processes, are the same.

Corporate climate change strategy needs to draw on skills across the company, with a convergence between environmental, financial and legal disciplines. As the start date for the EU-ETS draws near, utility companies must ensure that they align their approach to carbon trading with other key processes in the company (see figure 6). Those companies that do not move quickly to show that they are addressing all these questions in a coherent way will risk being downgraded by investment analysts or credit rating agencies.

The starting point for any company is to decide what value strategy to pursue. In the long-term, enhanced shareholder value will only accrue to those companies that succeed in determining and implementing a clear and successful strategy for managing both their overall climate change risk and their CO₂ exposure. They will need to be able to plan and manage a range of issues that could create corporate financial risk.

Figure 6: Embedding the key processes within the company



Source: PricewaterhouseCoopers, *Emission critical*, 2004

Make the value connection

The critical elements outlined in figure 6 and in the previous chapter will together shape the value strategy of the company. Companies should already be a long way down the road of implementing measures for many of these elements, running scenario analyses and clarifying their overall value strategy.

Because emissions allowances and compliance is determined at the installation level, and because of the varying impact of national climate change policies, this will need to be performed for individual subsidiaries and installations, as well as at group level. This is a particular challenge for companies with overseas subsidiaries. Each subsidiary will have additional costs or profits as a result of emissions trading. This could have tax, dividend policy and investment implications. Some installations or subsidiaries may be uneconomic as a result of emissions trading. Companies need to consider what options they have for such stranded assets.

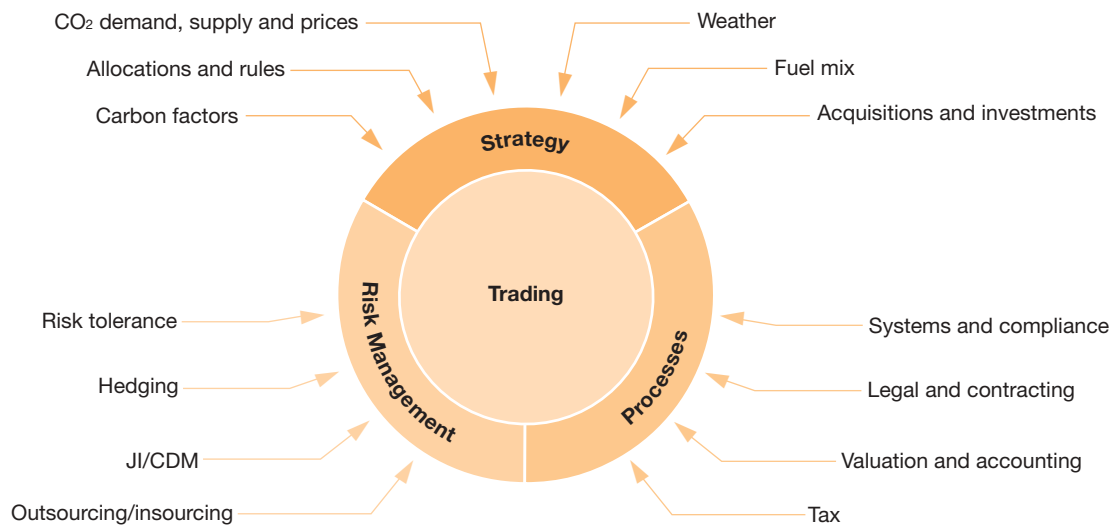
Determine your trading strategy

Emissions allowances can be held by companies for three purposes:

- for compliance, to cover actual emissions;
- for hedging, to manage market price risk between emission and delivery; and
- for trading, to generate profits from future price movements by buying and selling allowances, credits and related derivatives.

Clarity over the balance of ambition between managing allowances for compliance purposes and managing for trading profits will be vital for companies. Figure 7 shows some of the key factors that companies will have to assess.

Figure 7: Fundamental drivers of emissions trading



Source: PricewaterhouseCoopers, *Emission critical*, 2004

Irrespective of trading ambitions, most utility companies will need to participate in the market, either to purchase emissions allowances in cases where they foresee shortfalls in planned abatement or, less typically, where they expect to exceed target emissions. Critical questions face utility companies. Do they have a clear assessment of the market that will guide buy and sell decisions? Should they risk entering the market early, despite uncertainty about final market shape and rules, or wait in the hope of a long market developing and risk price spikes? How far should they use derivatives and engage in arbitrage?

Companies will need to manage both a compliance function and a trading function. These will need to be kept separate from a risk management perspective, but they will also need to work in synergy. Smaller companies may wish to outsource the trading activity to external, specialist traders or to develop this capability in partnership with others. These options may help access the necessary skills and expertise, but they also raise new governance and risk management issues, which will need to be addressed. The key elements of the timetable for the development of compliance and trading functions are outlined in Figure 8.

Figure 8: Countdown for companies

	2004	2005	2006	2007	2008	onwards	
	Pre-trade	European trading				International trading	
		International credits (ERU/CER) bankable*				Full fungibility	
Organisation	→						→
Monitoring	→						→
Systems	→						→
Disclosure	•						
Accounting		•	•	•	•	•	
Compliance			•	•	•	•	
Reporting		•	•	•	•	•	

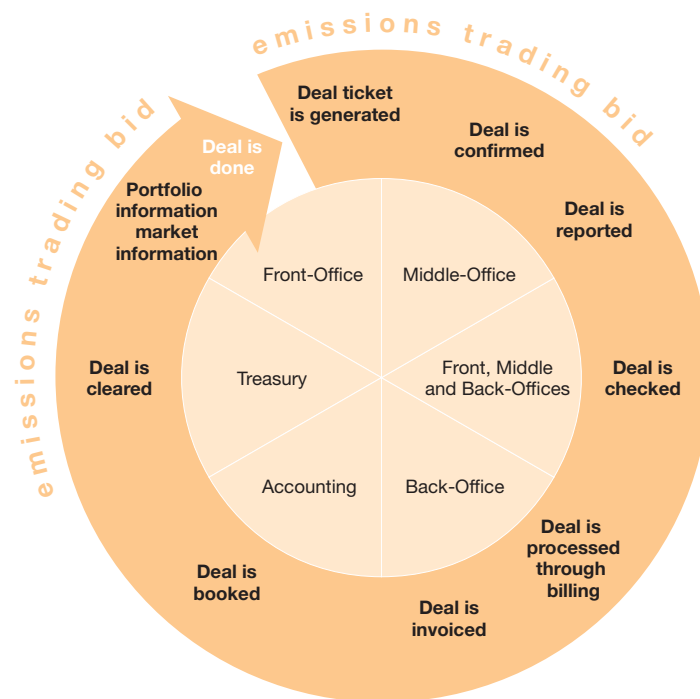
Note:

*CERs may be fungible as soon as 2005, depending on the adoption of the Linking Directive, subject to the implementation of national 'Competent Authorities'.

Source: PricewaterhouseCoopers, *Emission critical*, 2004

Companies will need to ensure that they establish rigorous emissions trading procedures. Figure 9 illustrates the need for different operational functions to deliver both synergies and separation of roles to provide effective handling and monitoring of deals.

Figure 9: Segregation of duties through life cycle of the emissions trading deal



Source: PricewaterhouseCoopers, *Emission critical*, 2004

Communicate to investors

The value implications of emissions trading will require careful explanation to shareholders. Utility companies should communicate the opportunities arising from emissions trading with their assessment of how they can create value in a changing energy market.

There will be a journey of change for all companies. Investors will need to understand a company's assessment of their best transition route. How will the company fuel mix strategy change? Will clean energy and emissions management be part of the company's value proposition? Does the company expect to use trading purely for emissions compliance purposes or does the company intend to go beyond that and pursue a more dynamic trading strategy? How will the company extract most value from high-carbon generation plant? How will the company manage stranded assets?

Investors must be able to see a clear rationale for the management of the company's portfolio of assets and its trading position. This should, in turn, be part of a wider strategic approach to climate change. It is not just about getting it right, but also about communicating that they are getting it right.

Get reporting right

Emissions trading schemes in different countries are likely to have different rules. The accounting for each scheme should reflect the way in which that scheme operates.

Multi-national companies that have operations covered by more than one scheme must consider the detail of each scheme separately when applying their group accounting policies for emissions to its international operations.

There are three primary elements to accounting for emissions trading: (1) accounting for the liability relating to emissions made; (2) accounting for allowances awarded by the government; (3) accounting for allowances purchased. The accounting for the liability that arises from emissions made is addressed by IAS 37. This requires that the liability be measured at the present value of the expected future expenditure required to settle the obligation. A liability is recognised only to the extent that emissions have been made. Changes in the liability, whether from additional emissions or from revisions to the expected cost of settling the liability, are recognised in the income statement.

The International Financial Reporting Interpretations Committee (IFRIC) is in the process of issuing guidance on the accounting for the allowances. It proposes that the allowances be classified as 'an intangible asset that is like a currency'. This classification is proposed because the allowances have value only because they can be used to settle an obligation. The allowances will be recognised at fair value, with movements in fair value recorded in the income statement.

The IFRIC proposals include an amendment to IAS 38 to require this accounting treatment. The IFRIC proposals confirm that IAS 37 is the appropriate standard to apply for accounting for the liability.

The fair value of the allowances is their market value at the balance sheet date. The present value of the liability is measured as the market value of the number of allowances required to cover the emissions made up to the balance sheet date, but only to the extent that the liability will be settled through allowances. The full accounting implications for allowances awarded by governments are still under consideration. The accounting guidance is expected to be finalised towards the end of 2004.

Part of the investor communications challenge will be explaining changes in the accounts and the potential volatility which may result. Continuous and perfect matching of the allowance and the liability, both in terms of volume and value, is unlikely to be achievable. Each is accounted for differently and a movement in one will not necessarily be recognised by an offsetting movement in the other. Companies will need to examine ways of minimising or compensating for this potential volatility.

Some installations or subsidiaries may be uneconomic as a result of emissions trading. These 'stranded assets' will be measured for impairment in accordance with the normal IAS 36 impairment guidance. The recoverable amount test will be performed at the individual installation level as the cash flows generated from a single installation will generally be independent of those generated by other installations. The cost of acquiring allowances and any emissions penalties will be included in the cash outflows of the emitting installation, affecting the calculation of value in use. The emissions trading schemes will, therefore, probably result in impairment charges being recognised against those installations that are both high emitters and marginally profitable.

Understand the M&A and investment implications

In *Power Deals*, the PricewaterhouseCoopers survey of M&A activity in the utilities sector in 2003, we noted that the impact of emissions trading was already starting to show in asset prices in the power sector. However, because views of the impact of emissions trading vary, we may not see significant carbon-led deal activity in the power sector at least until the trading scheme is launched next year. In the longer term, though, we do expect to see carbon-led deals, particularly at the asset level, as companies review their portfolios to achieve the right fuel and geographic balance. We may even see some opportunistic bid activity against companies who are slow to capitalise on the new value proposition.

Carbon assessment therefore needs to be a core component of M&A strategy and processes. Is the full carbon risk or opportunity of the asset understood and factored into the company's deal calculations? Has the market factored carbon into values, of the aggressor, as well as the target? Are there synergies? Do due diligence processes look at carbon?

Similarly, is carbon assessment an integral part of all capital investment decisions? How might it change target IRRs, or decisions on location or timing? Because of the lead time on investment decisions and the long-term nature of the industry, these issues should already be being addressed. Do the staff working in these areas understand the implications of emissions trading? Is their work integrated into a broader carbon strategy?

Maximise the use of the Flexible Mechanisms

Joint Implementation (JI) and the Clean Development Mechanisms (CDM) are two leading articles (§6 and §12) of the Kyoto Protocol that will allow companies to use the credits arising from emissions reduction investments in economies in transition and developing countries to be offset against their emissions obligations. The 'Linking Directive', currently under discussion at the European Parliament, will allow JI and CDM credits to be used in the EU-ETS.

The lead time for developing JI/CDM projects means that companies face a race against time to make the most of this aspect of flexibility. Three to seven years is a typical period from identification and licensing of JI/CDM projects through to operation and delivery of the first emissions reductions (ERs). As the World Bank points out "for projects to deliver a significant proportion of their ERs by 2012, they need to be operational by 2006 or 2007 at the latest, and thus be contracted by at least 2006" (Source: p 26, *State and Trends of the Carbon Market 2003*, PCIplusResearch/World Bank).

The JI/CDM route requires careful appraisal by companies. The approval process at both the initial stage and for issuing certificates is complex. Companies also need to be confident that they have the risk strategies in place to address both overall geopolitical risk and the more specific risks that flow from the requirements on host countries to comply with the Kyoto Protocol obligations in regulating JI/CDM projects. The construction of contracts, in particular framing legal arrangements for buyer versus seller liability, will require careful scrutiny.

Finally, of course, there is the fundamental challenge of securing finance. The nature of JI/CDM initiatives requires a special dialogue with banks and other sources of finance. Many banks are currently uncomfortable with the new instruments and are seeking to have their cake and eat it, with rights over carbon credits on the one hand, without recognising their value in the project cash flows on the other.

Get on top of the tax issues

Taxation will add another layer of complexity into the planning of emissions trading. The tax consequences are potentially considerable, so utility companies need to engage in active tax planning now.

There are likely to be strong operational and tax advantages, for example, in centralising the trading function in countries with a low tax regime.

Central carbon management could also enable pooling, either physically or notionally, of short and long allowances positions within a group of companies. In turn, this could minimise the exposure of the group as a whole to price fluctuations and liquidity risks. The structuring of any pooling, though, will need to take account of tax implications and exposures.

These tax planning issues are complicated by uncertainties in relation to the tax treatment of particular aspects of emissions trading. These are likely to be addressed by detailed guidance from the relevant tax authorities in due course, but will still be subject to evolution. The main areas of uncertainty are:

- The tax treatment of granted allowances

Allowances granted under the national allocation schemes might be seen as a taxable subsidy and so be subject to a different tax accounting treatment than those purchased on the market.

- The VAT treatment of transactions

The VAT treatment will depend on whether transactions are regarded as the transfer of a right or as a transaction in other securities. A 'transfer of a right' is taxable under European VAT law, whereas a transaction in securities is an exempt financial service. In this latter case, however, the benefit of the exemption is mitigated by the inability to offset input VAT incurred in the costs of the emissions trading activity against any VAT liability. This treatment could be different, however, if the acquirer of the certificate is established in a non-EU country.

Seize the initiative

Emissions trading has immediate and important implications for utility companies. This report has addressed both the high level context and the detailed preparations that companies need to make. Effective strategies that make the connection between emissions trading and value will be vital. In turn companies need to be ready to communicate these compellingly to capital markets that are becoming increasingly aware of climate change risks generally, as well as specific emissions trading risks. Clarity on overall strategy needs to be matched and integrated with effective and robust systems to optimise trading, tax, legal and special project needs and opportunities.

There is no single, standard solution. Individual companies will face different challenges. But there is both a common imperative and a common opportunity. The imperative of managing the process to enhance and protect value for shareholders is particularly immediate in Europe as emissions trading legislation takes hold. The wider opportunity is for companies to set a lead and to gain advantage from the momentum that this could offer. Companies that seize the initiative will be well placed in a business context that will become increasingly dynamic, with the interplay of consumer, regulatory and capital markets forces presenting new challenges and opportunities worldwide.

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