Utilities global survey 2008

# A world of difference*

## Tomorrow's power utilities industry

Utilities global survey 2008

# A world of difference*

monopoly supply liberalised markets

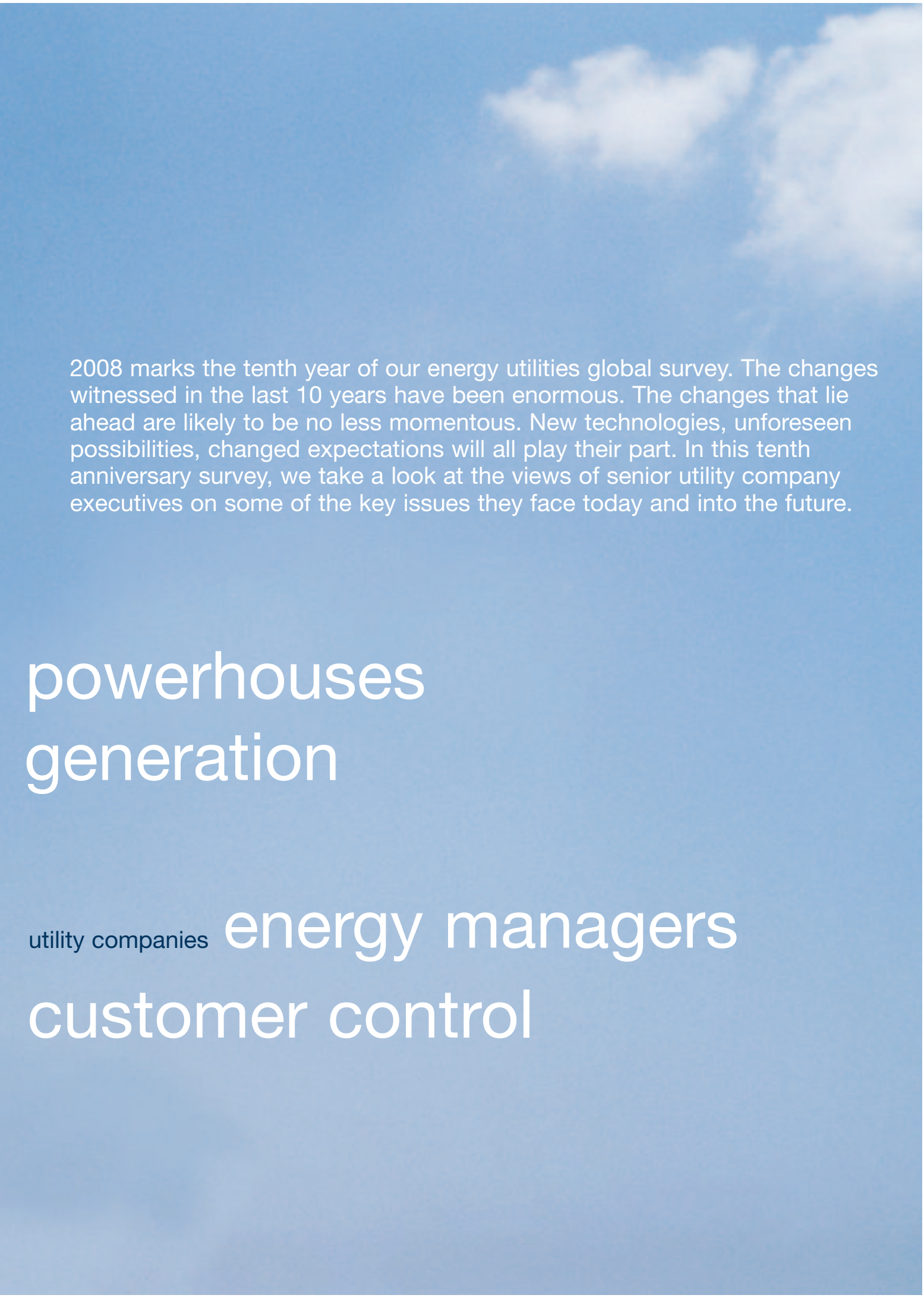
municipal utilities global

grid power decentralised

wind power tidal energy

dash for gas clean coal

supplier choice smart



2008 marks the tenth year of our energy utilities global survey. The changes witnessed in the last 10 years have been enormous. The changes that lie ahead are likely to be no less momentous. New technologies, unforeseen possibilities, changed expectations will all play their part. In this tenth anniversary survey, we take a look at the views of senior utility company executives on some of the key issues they face today and into the future.

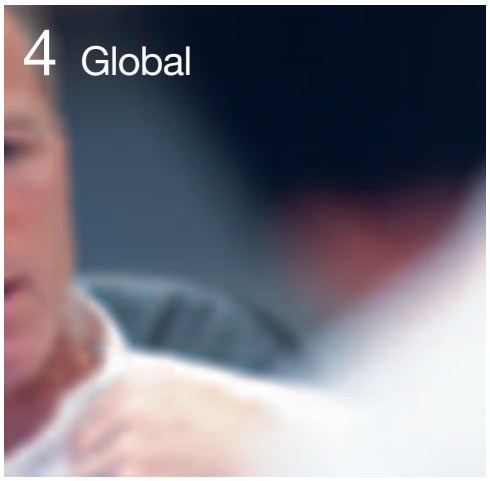
# powerhouses
# generation

utility companies energy managers

# customer control

2 Report highlights

4 Global



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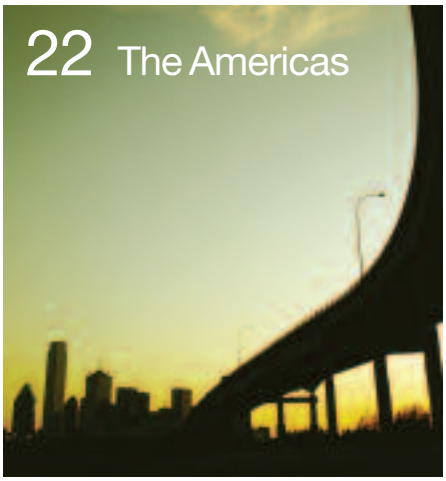
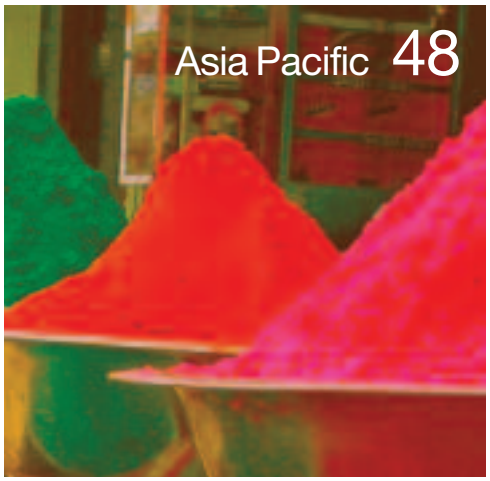


# Utilities global survey 2008

"The word 'energy' incidentally equates with the Greek word for 'challenge'. I think there is much to learn..."

Thomas Carr, testimony to the US Senate Commerce Committee, September 1974



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This year's survey interviewed 118 senior power utility executives from 115 utility companies in 37 countries from 4 major regions.

The Americas
Argentina
Canada
Mexico
Peru
United States
Venezuela

Europe
Croatia
Czech Republic
France
Germany
Greece
Hungary
Ireland
Italy
Netherlands
Norway
Poland
Russia
Slovenia
Spain
Sweden
Switzerland
United Kingdom

Asia Pacific
Australia
India
Japan
Malaysia
New Zealand
Philippines
Sri Lanka

Middle East & Africa
Botswana
Jordan
Kenya
Namibia
Qatar
South Africa
United Arab Emirates

Each year PricewaterhouseCoopers goes to the heart of boardroom thinking in utility companies across the globe. 2008 marks the tenth year of our utilities survey. The changes witnessed in the last 10 years have been enormous. We have moved from a time when climate change barely registered a mention in a company's annual report to one where it is on the lips of every chief executive who runs a power utility business. Similarly, we have moved from a highly fragmented, domestic and, often, municipal utility landscape of 10 years ago to one where the leading companies have a pan-continental and, increasingly, global presence.

Both these forces – the external one of climate change and the internal momentum of industry consolidation and realignment – have a long way to run and, indeed, interact with each other. *A world of difference* is the theme of this tenth anniversary edition of our survey. We examine the changes that senior executives from utility companies around the globe expect to witness over the coming decade. We look at the different regions and markets, many of which are at varying stages of development and remain very different from each other. In this edition, we also talk to senior boardroom figures from some of the leading power equipment and technology suppliers to the utilities industry to discover the changes they foresee on the horizon.

We find that senior utility executives are anticipating a world with a much wider range of power technologies than at present, where customers may be equally at home, for example, managing their own distributed power as taking it from the grid. It is a world where the leading utility companies of tomorrow will not only be global brands but they are also likely to be 'power facilitators', where more customers , for example, may be managing their own power locally, as well as 'power providers'.

We find that survey respondents are quite bullish about the pace at which technological innovation may herald improvements in energy efficiency and reduced emissions but that the successful development of such technologies will hinge on whether there are sufficient economic incentives through the price of carbon or some other government-imposed financial mechanism.

Throughout the decade we have been conducting the survey, PricewaterhouseCoopers has been working alongside utility companies across the globe on projects that, in many cases, have been at the heart of industry change. In this report, we take the opportunity to review some of these utility industry assignments with a series of landmark case studies. The report also includes a series of regional and country reviews that examine the specific issues as seen by utility company senior executives in their individual country and regional markets.

Finally, we look ahead to an energy utilities landscape that is likely to look very different in 15-25 years' time. We see governments being more interventionist to put a price on carbon and an overall shift towards greener and more distributed generation. But the extent of this shift will be determined by how far governments and the public are willing to accept the economic costs of change. We also foresee landmark changes in industry structure with the boundaries between the power utilities, oil and gas, power equipment and technology and mining sectors in flux.

**Manfred Wiegand**
Global Utilities Leader

## A future world of power generation diversity and innovation

There has been a big surge in expectations that a diverse range of generation technologies – wind, solar, geothermal, combined heat and power, other forms of distributed generation and a range of combustible renewable and waste generation – will have a significant impact on companies' power markets in the next 10 years. The proportion of survey respondents anticipating that distributed generation will have the greatest impact has doubled – from 24% just two years ago to 49% in this year's survey. Even more striking, the proportion expecting solar power plants to have the greatest impact has risen from 20% to 54% in the same period.

## Economic signals on the carbon price and energy efficiency hold the key

Survey respondents attach considerable importance to carbon trading being put on a more secure long-term, world-wide and sector-wide footing. They see a carbon emissions cap that creates genuine scarcity in allowances as key to any trading scheme that addresses the issue of emissions. When it comes to energy efficiency and energy savings, the view that it is for governments not the utility industry to spearhead progress has hardened considerably. Companies are investing in both their own and end-user energy efficiency but nearly three-fifths (59%) say governments should take the wider lead. Economic signals, and, in turn, higher energy prices, will hold the key to both carbon emission reduction and energy efficiency. The big question mark is whether governments will have the will to facilitate a higher price environment.

## Is there sufficient impetus behind carbon capture?

Nuclear and renewable generation are expected to have the biggest impact on limiting greenhouse gas emissions (GHGs) with nuclear having the edge. The impact of nuclear over and above renewables is rated particularly strongly by American respondents – 56% ranking nuclear highly compared to only 35% giving a similar ranking to renewable generation. However, given that coal is widely expected to continue be a mainstay and, indeed, to grow in the world power generation fuel mix, many observers might expect utility company executives to rank the long-term impact of carbon capture higher. Only a quarter (25%) expect carbon capture from coal to make a big impact in the next 10 years but, rather surprisingly, this barely changes when respondents look ahead to 2050 with only 26% believing it will have the biggest impact on GHGs even in the middle of the century.

## Changes ahead in the power sector footprint

Utility companies are expecting significant changes in the industry landscape over the coming decade. There has been a big change in outlook in the space of just 12 months. In the 2007 survey, only 33% of respondents envisaged making direct investment upstream. By 2008, this had risen to 51%. Downstream, the line between utilities and customers will become increasingly blurred. For the first time ever, the competitive threat from energy intensive companies establishing their own power generation is rated as high as the threat from other utility companies. The threat from oil and gas companies moving into the utilities space is also rated higher than in previous years. Companies are seeking to extend their value chains through vertical integration in order to establish positions where their fuel supply source or end-market, in the case of oil and gas companies, is secured.

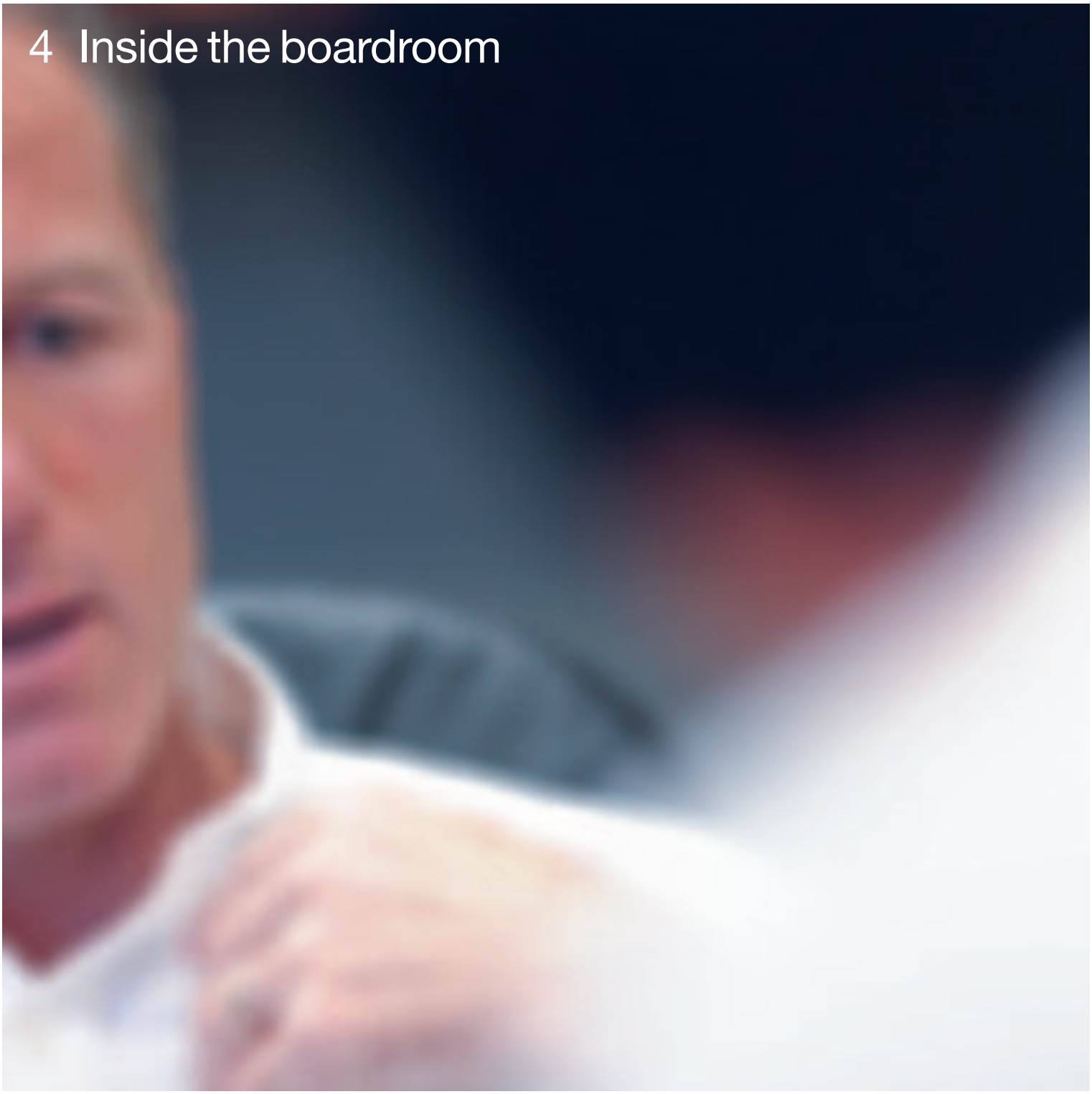
## Regulatory moves will be a key shaper

Respondents expect increasing regulation and obligation to be a major force shaping the sector. Utilities expect regulatory developments to trigger repositioning by country and across the value chain. This is particularly the case in Europe but is also evident elsewhere with the extent of repositioning increasing significantly during the next decade. Within 10 years, 48% of all respondents expect to have repositioned internationally and 42% within the value chain in response to regulatory moves compared to 38% and 28% doing so now.

## The move to global utility brands strengthens

Leading utility brands, EDF and E.ON, feature not just at the top of the survey's ranking of the leading global utility players but also appear, for the first time, in a regional market outside Europe in respondents' ranking of 'super regional' companies in their home markets. The survey shows EDF and E.ON grabbing significant mind share among respondents from the Middle East and Africa.

# 4 Inside the boardroom



Utility companies face a major challenge in realising their upstream ambitions. With intense competition from the oil majors and national oil companies, the scope for some landmark alliances or joint initiatives cannot be ruled out.

The world of power utilities has changed remarkably since our first survey of boardroom opinion 10 years ago. The spread of liberalised markets, the rise of global utility company brands, new forms of power generation and, of course, heightened climate change awareness are just a few of the developments that are making a world of difference to the power utilities industry. It is clear from the responses of top utility company executives to our 2008 survey that the next 10 years will produce similar profound changes.

## A changing industry landscape

Utility companies are anticipating significant changes in the industry landscape over the coming decade. The need to secure energy resources is focusing company sights on upstream supply and, at the same time, blurring the lines between utility companies and oil and gas companies. Upstream integration via direct investments and joint ventures is on the agenda of more than half the survey respondents and more than a third (37%) are planning upstream acquisitions within the next five years (see figure 1). There is a big increase in the emphasis placed on these strategies even compared to last year's survey. In 2007, only 33% of respondents envisaged direct investment upstream. By 2008, this had risen to 51%.

However, utility companies face a major challenge in realising these ambitions. They face intense competition from the oil majors, for example, in securing upstream equity assets in gas and the state-owned national O&G companies will also be seeking to maximise their control over assets. The companies that succeed will need to be adept at identifying and nurturing contract and investment relationships and opportunities. Clearly, with such intense competition, the scope for some landmark alliances or joint initiatives cannot be ruled out.

Figure 1: **How are you responding to upstream fuel challenges now and in the next 5 years?**

| | 2007 | 2008 |
|---|---|---|
| Improve your company procurement | 39% | **64%** |
| Secure current fuel mix by entering into long-term contracts | 49% | **54%** |
| Upstream integration via joint venture or alliance | 27% | **53%** |
| Upstream integration via direct investments | 33% | **51%** |
| Secure current fuel mix by sourcing fuel from new regions | 26% | **38%** |
| Change fuel mix in new & planned plants | 29% | **38%** |
| Upstream integration via acquisitions | 16% | **37%** |
| Change fuel mix in existing plants | 27% | **28%** |

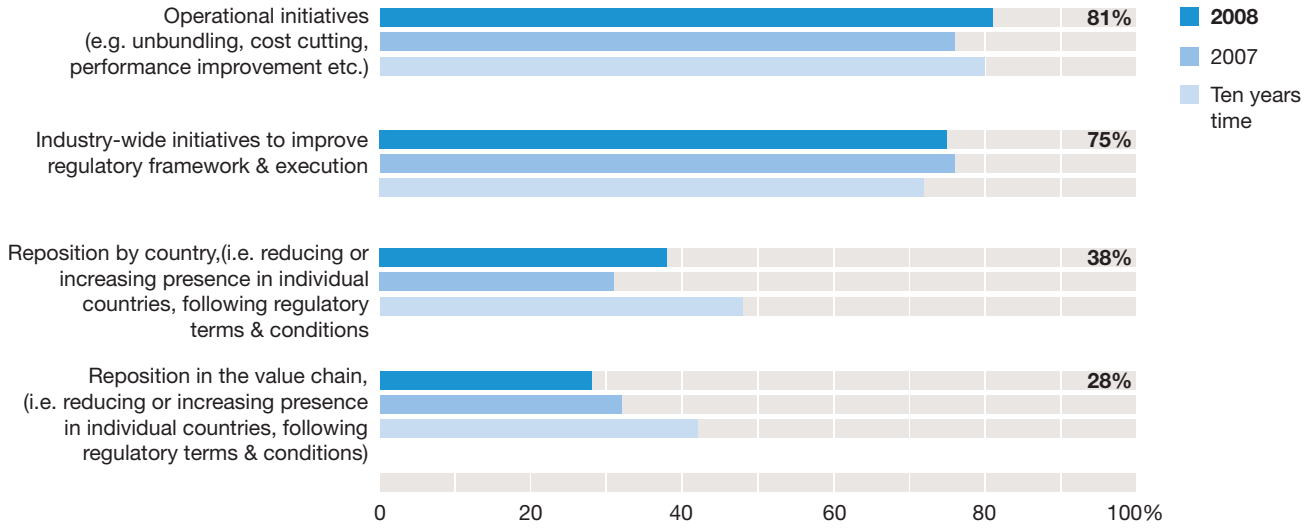
**Note:** Global responses only
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

Figure 2: **Looking ahead over the next 10 years how would you rate the competitive threat posed to companies in your sector in your home territory by the following?**

| | 2004 | 2006 | 2008 |
|---|---|---|---|
| Utility companies based in your home territory | 2.7 | 2.6 | **2.6** |
| European utility companies from outside your home territory | 2.5 | 2.3 | **2.4** |
| US-based utility companies | 2.0 | 2.0 | **2.0** |
| Companies from the oil and petroleum sector | 2.1 | 1.9 | **2.5** |
| Financial institutions and investment banks | 2.3 | 2.0 | **2.2** |
| | | | |
| *New entrants from energy-intensive user | | | **2.6** |
| *New entrants from construction & contracting supply business | | | **2.1** |

**Note:** Average response. Rate where: 5 = greatest threat; 1 = no threat
*Question not asked in 2004 and 2006
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

Figure 3: **How are you responding to regulatory challenges now and in ten years time?**




**Note:** % share of responses
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

Repositioning in response to regulatory moves, while most evident in Europe, is not confined to that continent.

Utility companies also face competition in the form of moves downstream by oil and gas companies as they seek to secure or move closer to end-markets. Given the shared challenge faced by utility companies and O&G companies to secure long-term access to fuel and to markets, the competitive threat from oil and gas companies is rated higher by senior utility company executives than in previous years, rising to nearly rival that from other utility companies (see figure 2). Downstream, the line between utilities and customers is also becoming increasingly blurred. The competitive threat from energy intensive users is rated as high as the threat from other utility companies. Worries about security of supply and price volatility have increased the emphasis placed by energy intensive industrial companies on developing their own generation.

Underpinning these changes is the continuing importance of regulatory influences on the industry which, if anything, are intensifying as regulators respond to an era of higher power prices and the dynamics of changing markets. An increasing number of companies expect to move beyond industry lobbying and operational responses to regulatory moves. Already a significant proportion of respondents say their companies are repositioning by country (38%) or along the value chain (28%) as a result of actual or anticipated regulation. In 10 years' time, these proportions move higher still – to 48% and 42%.

In Europe, the momentum for repositioning is being driven by the European Commission's emphasis on energy market reform. Indeed, in February 2008, E.ON seized the initiative with an offer to sell its entire electricity grid. The move would end its business model of combining both energy production and electricity transmission. Already, the separation of transmission networks is well established in some European countries and E.ON's move is likely to accelerate its adoption in other countries. Repositioning in response to regulatory moves, while most evident in Europe, is not confined to that continent. In Asia, over a third (35%) of respondents said that they are repositioning by country and a quarter reported repositioning along the value chain with the latter increasing to 45% in 10 years' time. Around a quarter of American respondents also reported such repositioning now, rising to 30% in 10 years.

**A world of difference**
PwC at the heart of industry change

## Evolving markets in South America

High real GDP growth in many South American economies has created a significant need to attract both foreign and domestic investment in energy infrastructure. Over the past decade, market structures have shifted from state ownership to liberalised markets and, in some cases, have started back toward state control again. PricewaterhouseCoopers has worked with both the public sector and the private sector in various countries across the region to address issues arising from this environment. Key engagements have included the following:

**Integration strategy for Southern Cone gas networks**
The governments of Argentina, Brazil, Chile, Paraguay, Peru and Uruguay, with financial support from the World Bank, engaged PwC in 2006 to conduct a feasibility analysis on projects to integrate gas provision for Latin America's Southern Cone. In the first phase, we analysed the economic feasibility and efficiency of regional projects and selected priority projects. In the second phase, we evaluated three of the selected projects from an economic, technical, environmental and financial perspective. The report for this project is available on the World Bank's website.

**Utility performance improvement in Brazil**
Cemig, the main electric provider in the Brazilian state of Minas Gerais and one of the largest in the South American region, engaged PwC in 2003 on a continuing basis to assist with improving performance. This was delivered through the implementation of a risk management structure and service level agreements, strategic alignment and leadership development, performance management and evaluation of the cost of capital. We are currently auditing the Cemig's 'light for everyone' project and advising on management succession planning.

**Electricity tariff review in Argentina**
The Argentinean government engaged PwC to assist ENRE – the country's electricity regulator – in reviewing EDESUR's tariffs for the 2002-2007 period and to propose an alternative. A multidisciplinary team – including engineers, economists, actuaries, communication and marketing specialists and accountants – evaluated EDESUR's financial, operational and technical performance from 1992-2002 and analysed the distributor's submission. They then defined the rate-making methodology to be used, drafted an alternative proposal and assisted ENRE in the public hearing process. The proposals were later modified by the new government that took office after the 2001 crisis.

## A focus on cleaner power

For the second year running, encouragement of renewable energy topped the list of key developments that respondents expect to see in their power markets in the coming years (see figure 4). The focus on cleaner power and the associated concerns of emission regulation and energy efficiency top the agenda for utility company survey respondents in every major power market (figure 5). The emphasis on environmental issues completes a trend which started in 2004; it was strongly evident last year and is even more consistent this year, with the trio of renewable energy, emissions regulation and energy efficiency rated above other pressing concerns such as security of supply.

Figure 4: **The rise of renewables and efficiency – Top six ranking of the most important major developments in your power market over the next five years**

| | 2008 | | Last year: 2007 | | Four years ago: 2004 |
|---|---|---|---|---|---|
| 1 | Encouragement of renewable energy | 1 | Encouragement of renewable energy | 1 | Increasing transmission capacity |
| = 2 | Regulation of emissions | =2 | Increasing efficiency | 2 | Concerns over security of supply |
| = 2 | Increasing efficiency | =2 | Concerns about security of supply | 3 | Increased JV activity from oil majors/financial institutions |
| = 4 | Concerns about security of supply | 4 | Increasing regulation and obligation | 4 | Continuing wholesale price volatility |
| = 4 | Increasing regulation and obligation | 5 | Regulation of emissions | 5 | Increasing regulation and obligation |
| = 4 | Continuing wholesale price volatility | 6 | Continuing wholesale price volatility | 6 | Encouragement of renewable energy |

**Note:** Global responses only
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

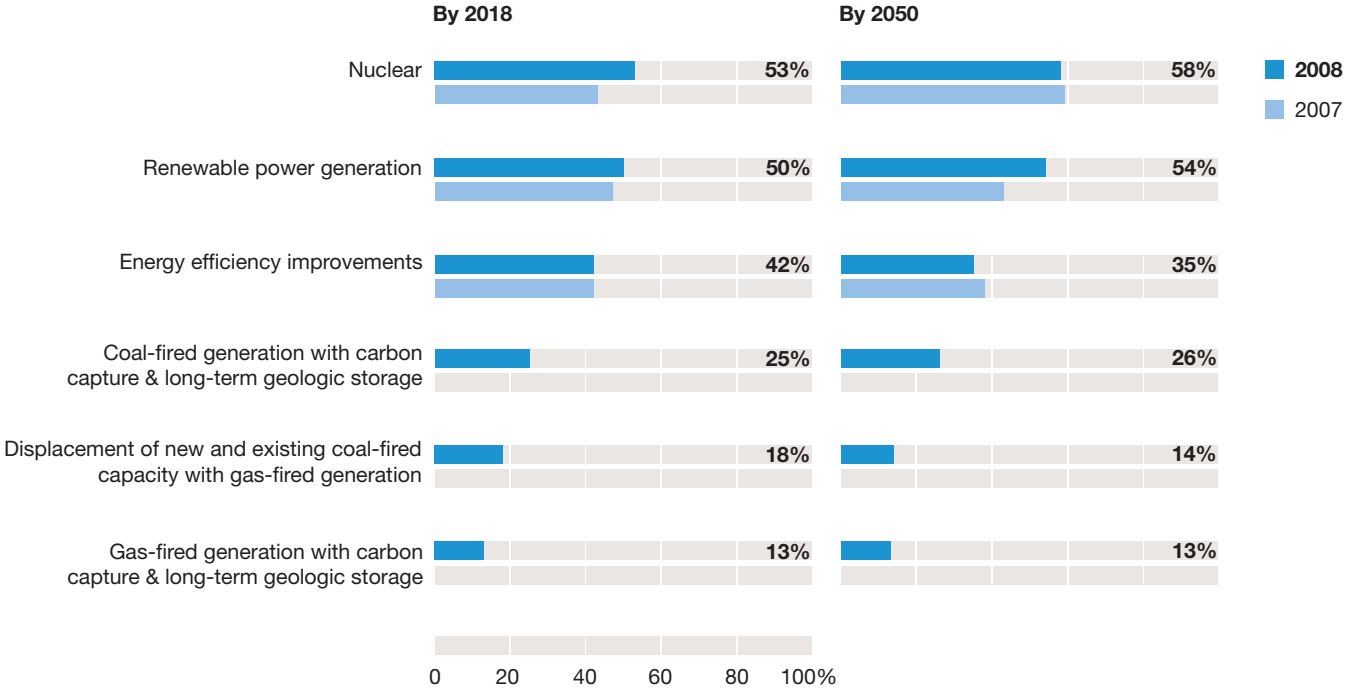
Figure 5: **Major likely developments in the main regions**

| | The Americas | | Europe | | Asia Pacific |
|---|---|---|---|---|---|
| 1 | Encouragement of renewable energy | 1 | Encouragement of renewable energy | 1 | Encouragement of renewable energy |
| =1 | Increasing efficiency | =1 | Regulation of emissions | =1 | Regulation of emissions |
| 3 | Regulation of emissions | 3 | Increasing efficiency | 3 | Increasing efficiency |
| | | | | | |

**Note:** Regional responses only
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

An election year in the US, a commitment to $CO_2$ emission reduction by the new Australian Government and EU proposals to cut greenhouse gas emissions by 20% are all acting as spurs to the examination of which technologies can best reduce emissions. Survey respondents place a major emphasis on renewable generation in terms of which technology will have the biggest impact in reducing greenhouse gas emissions (GHGs) (see figure 6). However, both in the medium term (10 years) and in the longer term (by 2050), it is the expansion of nuclear power that is cited by most. Just over half (53%) put nuclear power at the top or in second place in their ranking of what will have the biggest GHG mitigation impact in the next 10 years, rising to nearly three-fifths (58%) when respondents look ahead to 2050. Thus, despite the long lead-in time for the construction of new nuclear plant and continuing opposition to nuclear power by many governments, a majority of utility company executives see nuclear playing more of a lead role than renewable generation even in a relatively short 10-year time frame.

Figure 6: **Which technologies do you expect to make the biggest impact on limiting the growth of GHGs from the supply of electricity?**



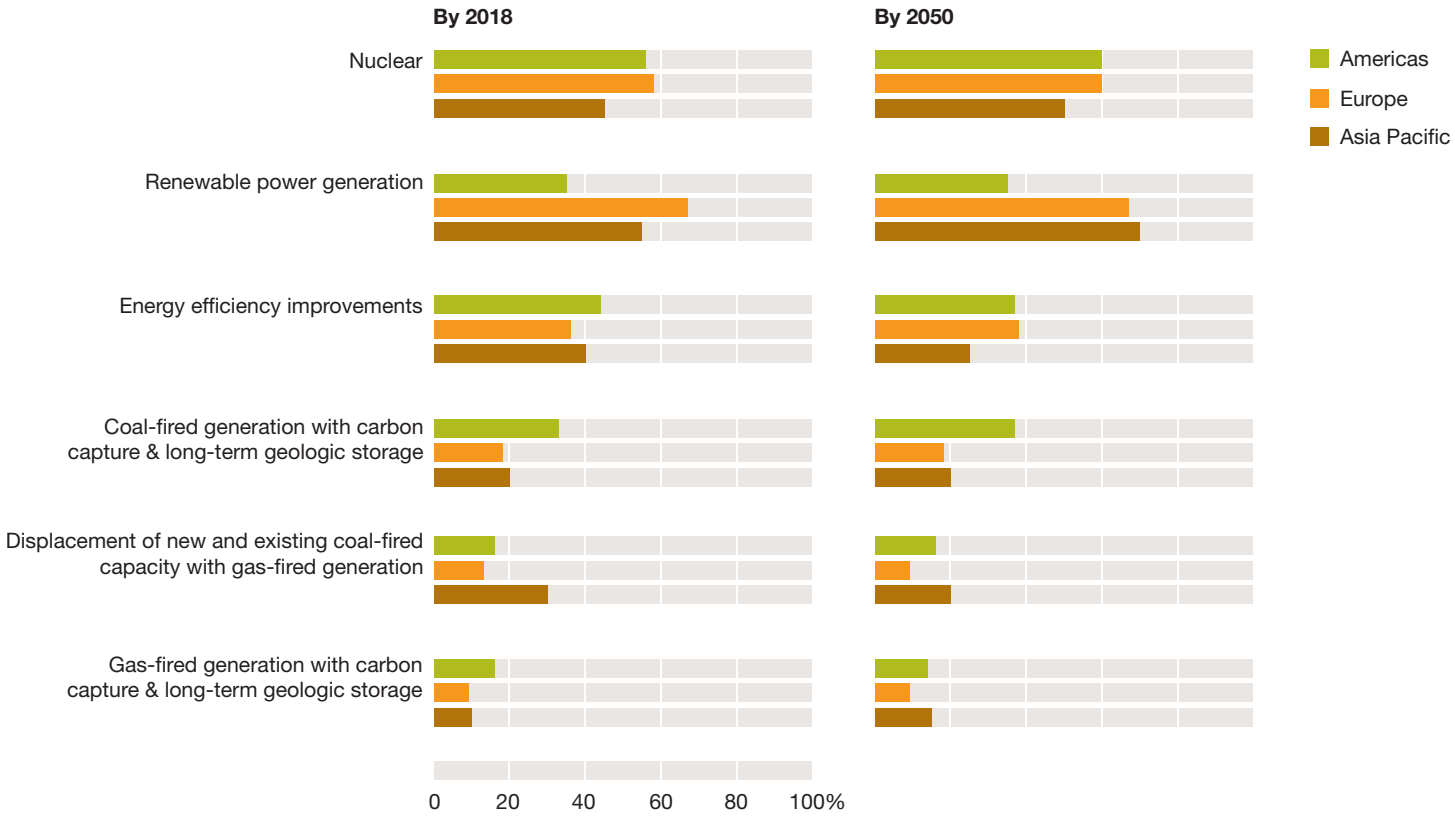

**Note:** Global responses only. % share of responses
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

Interestingly, there is a major contrast between the views of American and European respondents (see figure 7). Sixty-seven per cent of European respondents rank renewable generation highly compared to 58% putting nuclear high on the list. However, American respondents expect renewables to take a back seat compared to nuclear in mitigating GHGs – 56% highlight nuclear vs only 35% expecting renewables to make the biggest impact in the next 10 years. In Europe, many governments are continuing to hesitate when it comes to a revival of nuclear power whereas, in the US, initiatives such as the NuStart energy consortium are spurring nuclear expansion.

However, despite the attention given to renewable and nuclear generation, most projections of the electricity generation fuel mix indicate that it will be developments around coal and gas that will be of central importance in reducing greenhouse gas emissions. The reference scenario, for example, used by the International Energy Agency (IEA) estimates that the share of coal-fired power stations in total electricity generation will increase from 40% to 45% in 2030. Together, coal and gas-fired generation will grow from 60% of world electricity generation to account for 68% (International Energy Agency, World Energy Outlook 2007).

Given that coal and gas will continue to be mainstays of world power generation, the contribution of carbon capture technology and the extent to which cleaner gas-fired plant can replace less clean coal generation are both critical to the outlook for GHG emissions. Yet, only 26% and 14% of respondents expect such developments to play a lead role in reducing GHGs, even by 2050. Significantly, given that more than three-quarters of the increase in coal's share of the generation mix to 2030 is attributable to the growth of coal-fired plants in Asia, respondents from Asia are no more likely to give a high rating to the impact of carbon capture from coal than their counterparts elsewhere.

Figure 7: **Which technologies do you expect to make the biggest impact on limiting the growth of GHGs from the supply of electricity?**




**Note:** % share of responses
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

Many players are exploring carbon capture technologies. These include O&G companies who already have experience of injecting carbon into geological formations as well as engineering and technology companies. However, although the technology is available, it is expensive and is yet to be applied to large-scale power plants. In Europe, for example, the EU Commission is supporting the development of 12 demonstration projects. As part of this in the UK, the government is inviting companies to take part in a competition. The application and selection process, though, will not be completed until 2009 and this single demonstration project is not expected to be fully operational until 2014 at the earliest. There are similar individual pilot initiatives taking place around the world but they are isolated rather than widespread. It is difficult to envisage carbon capture having a big impact on emission levels in the short to medium term without a considerable acceleration and multiplication of such initiatives. However, it is hoped to have a significant long-term impact. Thus, survey respondents' expectation that the carbon capture picture in 2050 will be little different from 2018 seems pessimistic.

Developments around coal and gas will be of central importance in reducing greenhouse gas (GHG) emissions.

**A world of difference**
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## Delivering modern and market-ready IT systems for Russian power

HydroOGK is the second largest hydroelectric company in the world. It was established during Russian energy market restructuring as a key part of the future market. The company consolidates the major part of Russian hydroelectric power – more than 25 power stations with over 23GW of total capacity. HydroOGK has strategic plans to build new hydroelectric power stations and to develop power stations fuelled by renewable energy sources. The company is owned by the state but the plan is to sell about 50% of its shares.

The company's information systems, IT infrastructure and IT governance at its many power stations and at headquarters varied significantly. Company management wanted to formulate a common view of its target IT status in terms of systems, information, infrastructure and IT support functions. Without significant IT development, HydroOGK's management took the view that it would not be possible to achieve its ambitious strategic plans.

During 2006, PricewaterhouseCoopers assisted in the development of HydroOGK's long-term IT strategy, aligning IT with the overall business strategy and creating an improvement plan for the company's information systems landscape, IT infrastructure and IT governance. Our work assessed the pre-existing IT capability then, after intensive investigation of the requirements of the different business units, PwC developed target models for the IT systems landscape, IT infrastructure and IT governance. We analysed gaps between the current status and target model to develop several 'strategic initiatives'. Based on these 'strategic initiatives', a detailed IT Strategic Realisation plan for years 2007-2011 was developed. The many benefits include:

- IT Strategy is aligned with overall business strategy.
- IT is considered by the business not just as a support functions but also recognised as an organisational asset.
- IT Projects are prioritised based on strategic alignment.
- HydroOGK has a clear understanding of future IT functions, infrastructure landscape and governance models.
- A clear road map and plan to achieve the 'To-Be' state for IT has been developed and agreed.
- All major business stakeholders are taking ownership for all IT areas and will act as business sponsors in the realisation plan.

## The need for carbon certainty

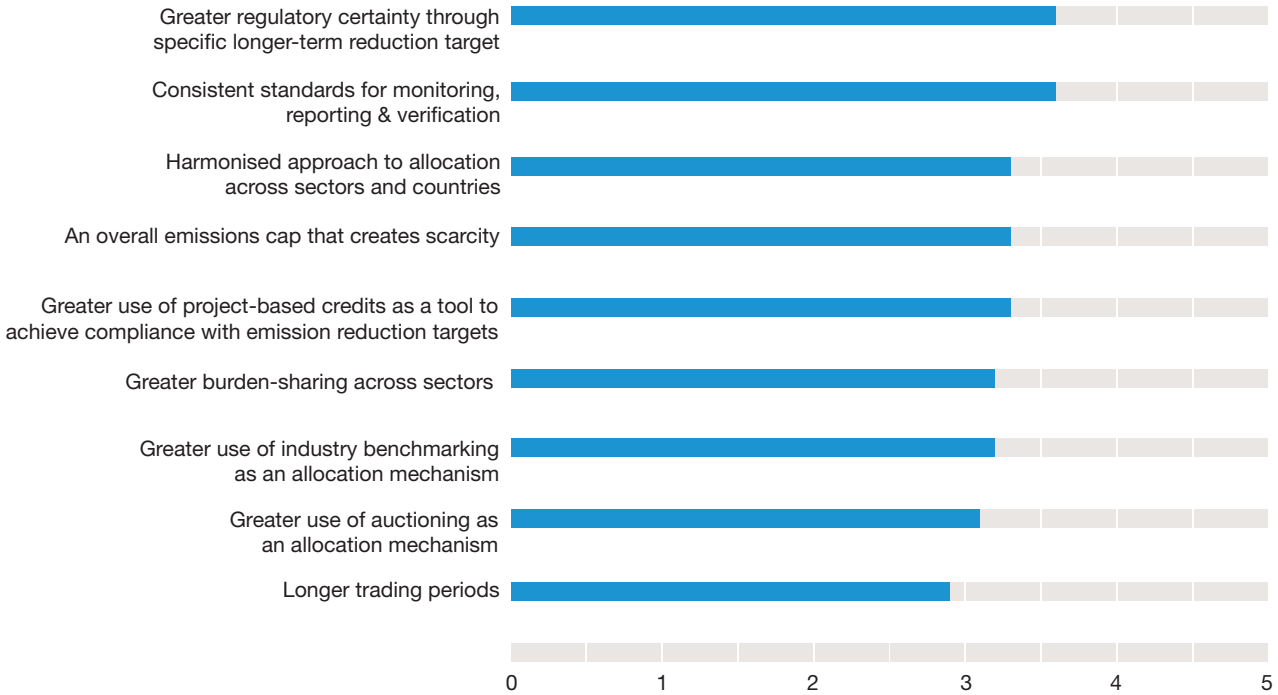
The importance of clean coal technological developments is reinforced by increasing recognition by investors of the risks associated with fossil fuel projects. In February 2008, three of the world's leading financial institutions – Citi, JPMorgan Chase and Morgan Stanley – launched a set of 'Carbon Principles' for evaluating and addressing carbon risks in the financing of electric power projects. They note "investing in $CO_2$-emitting fossil fuel generation entails uncertain financial, regulatory and certain environmental liability risks…. We will encourage regulatory and legislative changes that facilitate carbon capture and storage (CCS) to further reduce $CO_2$ emissions from the electric sector."

The regulatory framework governing emissions is a dominating factor in the long-term investment decisions that utility companies have to make on clean fuel technologies, renewable alternatives and their fuel mix portfolios. The risk that arises from uncertain regulation is reflected in survey respondents' desire to see cap and trade emission schemes being put on a more secure long-term, world-wide and sector-wide footing (see figure 8).

Not only is there a strongly felt need for specific longer- term reduction targets but utility companies also point to the need for better scheme structures in terms of monitoring, reporting and verification. In this respect, companies are mindful of the problems of over-allocation that characterised the first phase of the EU emissions trading scheme from 2005 to 2007 and the continuing difficulties in linking the EU's scheme to the UN's to allow the use of credits from projects in developing countries.

Significantly, while it is utility companies in Europe that have most direct experience of a $CO_2$ emissions trading scheme, strong scores were registered by respondents in all the major power markets across the world in response to the figure 8 question. The desire for a more certain longer term reduction target and more consistent reporting standards was particularly strongly felt by respondents from Asia-based power utility companies.

Figure 8: **Which of the following attributes do you see as important in cap-and-trade schemes to address carbon emissions?**

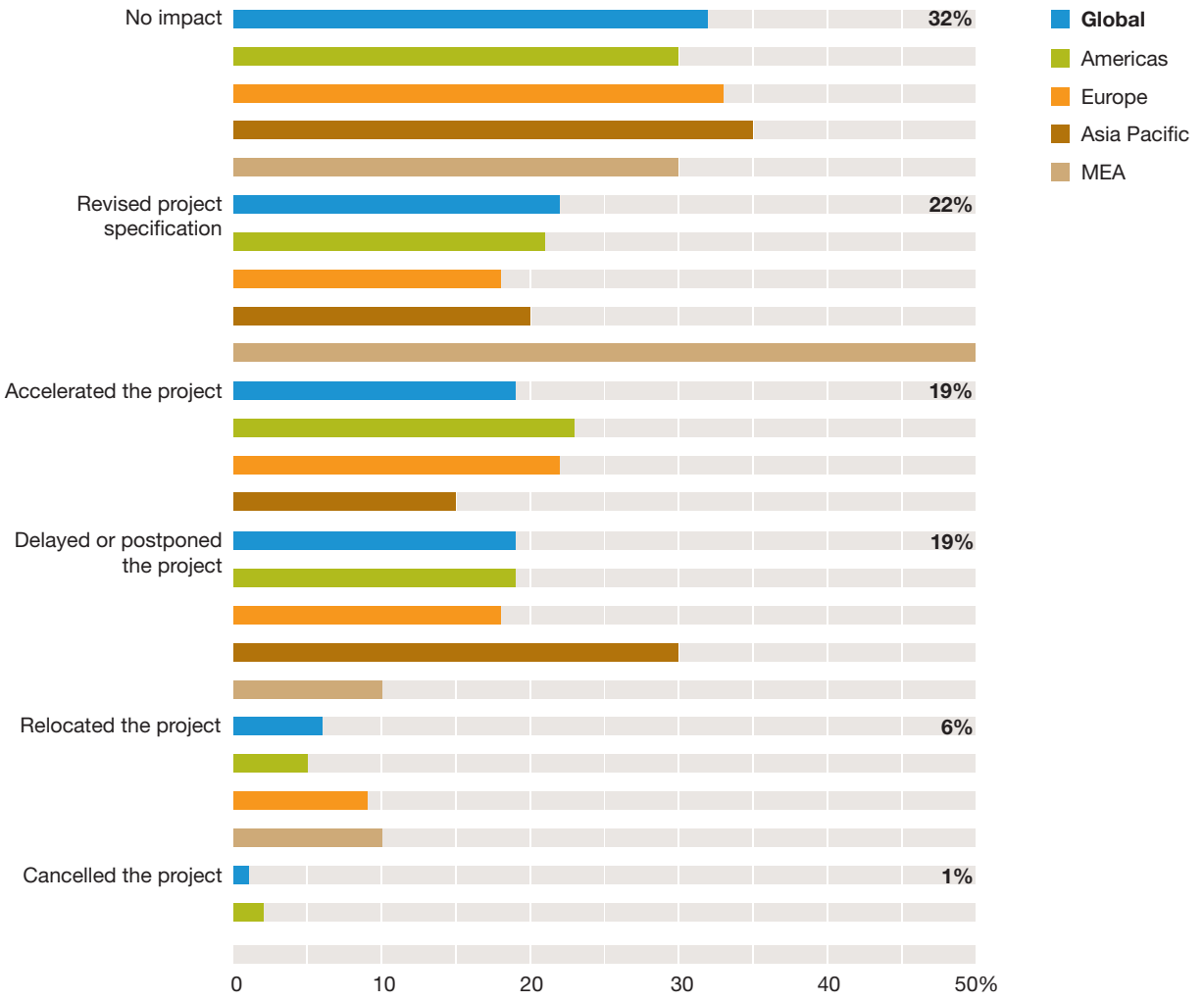



**Note:** Global responses only. Rate where 5 = very important; 1 = not important
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

Another critical issue for investment in cleaner power generation is the extent to which either cap and trade schemes or other regulatory frameworks are successful in creating sufficient economic incentives to switch fuels or invest in cleaner fuel technology. It is noteworthy that survey respondents attached a strong score to the need for an emissions cap that does create genuine scarcity, and therefore increases incentives to switch to cleaner generation (figure 8). The cost of carbon capture, for example, is considerable. A study for the Intergovernmental Panel on Climate Change (IPCC) estimates that power from a coal plant with capture and storage would cost 75% more than from current natural gas combined cycle generation (IPCC Special Report *Carbon Dioxide Capture and Storage*, 2005). Retrofitting existing coal plants is expected to lead to higher costs compared to new build installation. Although these costs are expected to come down as technology is developed and rolled-out, utility companies would require a significant carbon price signal or other economic incentive to make the necessary investment.

Although existing regulation does need developing and improving, two-thirds of respondents said that current emissions regulations and carbon prices to date have had an impact on investment decisions (see figure 9), either accelerating or delaying project decisions or prompting revised project specifications. The most spectacular recent example of environmental concerns having an impact came during the 2007 US$43.8bn takeover by Kohlberg Kravis Roberts and Texas Pacific Group of TXU, one of America's biggest utilities. Environmental concerns came to the centre of the deal agenda. TXU had planned to build 11 coal-fired power plants. In the run-up to the deal, KKR and TPG gained the backing of environmental groups by agreeing to scrap plans to construct eight of the plants. They also pledged to support a reduction in carbon dioxide emissions to 1990 levels by 2020. Taken overall, however, the results of figures 8 and 9 highlight that, while current regulation is beginning to bite, companies feel that greater future certainty and economic incentives will be required to really address carbon emissions.

Figure 9: **How have existing and proposed GHG regulations and the carbon price affected major capital project investment decisions to date?**




**Note:** Average response. % share of responses
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

## Environmental performance and investment

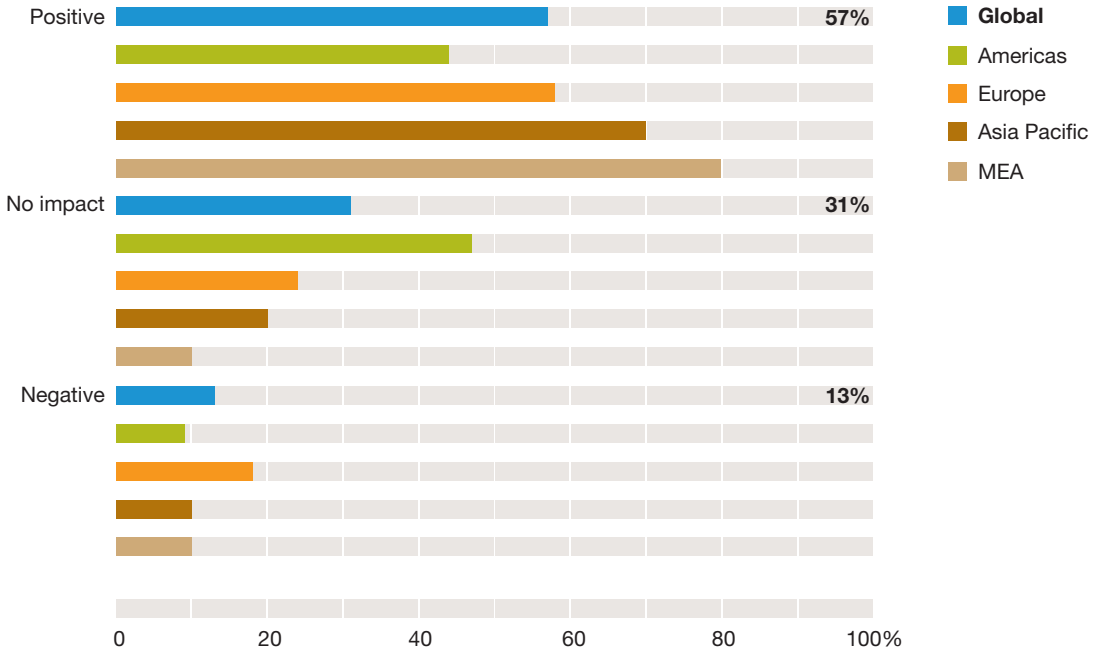
Investor initiatives, such as Citi, JPMorgan Chase and Morgan Stanley's 'Carbon Principles' (see page 12), highlight the importance of effective environmental and sustainability reporting by utility companies. Remarkably, when asked how they communicated on such matters, 23% of survey respondents said they did not communicate on climate change or emissions and 18% did not report on any sustainability performance measures. Yet it is clear that such matters can affect investment relations, particularly where carbon trading or other regulatory mechanisms impact investment feasibility and market performance. In Europe, for example, 76% felt their company's environmental strategy and performance had had an impact on investors with 58% reporting a positive impact and nearly one in five (18%) saying that their company had been adversely affected (see figure 10). Worldwide, 69% of respondents felt that their companies' environmental strategy and performance had had an effect on investors, split similarly to European respondents between positive and negative impacts.

## Technologies of the future

Two big shifts are taking place to create the conditions where a much wider range of generation possibilities will feature in future portfolios. First, there has been a significant shift in pricing patterns. All fossil fuels have become a lot more expensive, which has given other forms of generation a big boost in the market, increasing the value of renewable generation or other generation such as nuclear that does not produce carbon. The second big change is in governments' commitment to deliver a shift in the fuel mix – driven by a combination of concerns about security of supply and climate change. Thus, reinforcing the changed market price environment, we are seeing much more government-led momentum behind both the extension of carbon pricing and the prospect of upward carbon price shifts. Again, this brings zero or low carbon technologies, including carbon capture and storage, into play although, as we saw on page 12, our survey respondents believe such price signals need to be more certain.

Given these shifts, utility company respondents now expect a much wider spread of technologies to be important in the power markets of the future. In previous years, responses to our question on technologies majored on those related to energy efficiency, wind and nuclear. These remain close to the top of the technological agenda for companies (see figure 11) and, in particular, the proportion of respondents highlighting the importance of energy efficiency technology is up significantly, from 62% last year to 79%.

Figure 10: **What has been the impact of your environmental strategy and performance on your investors?**

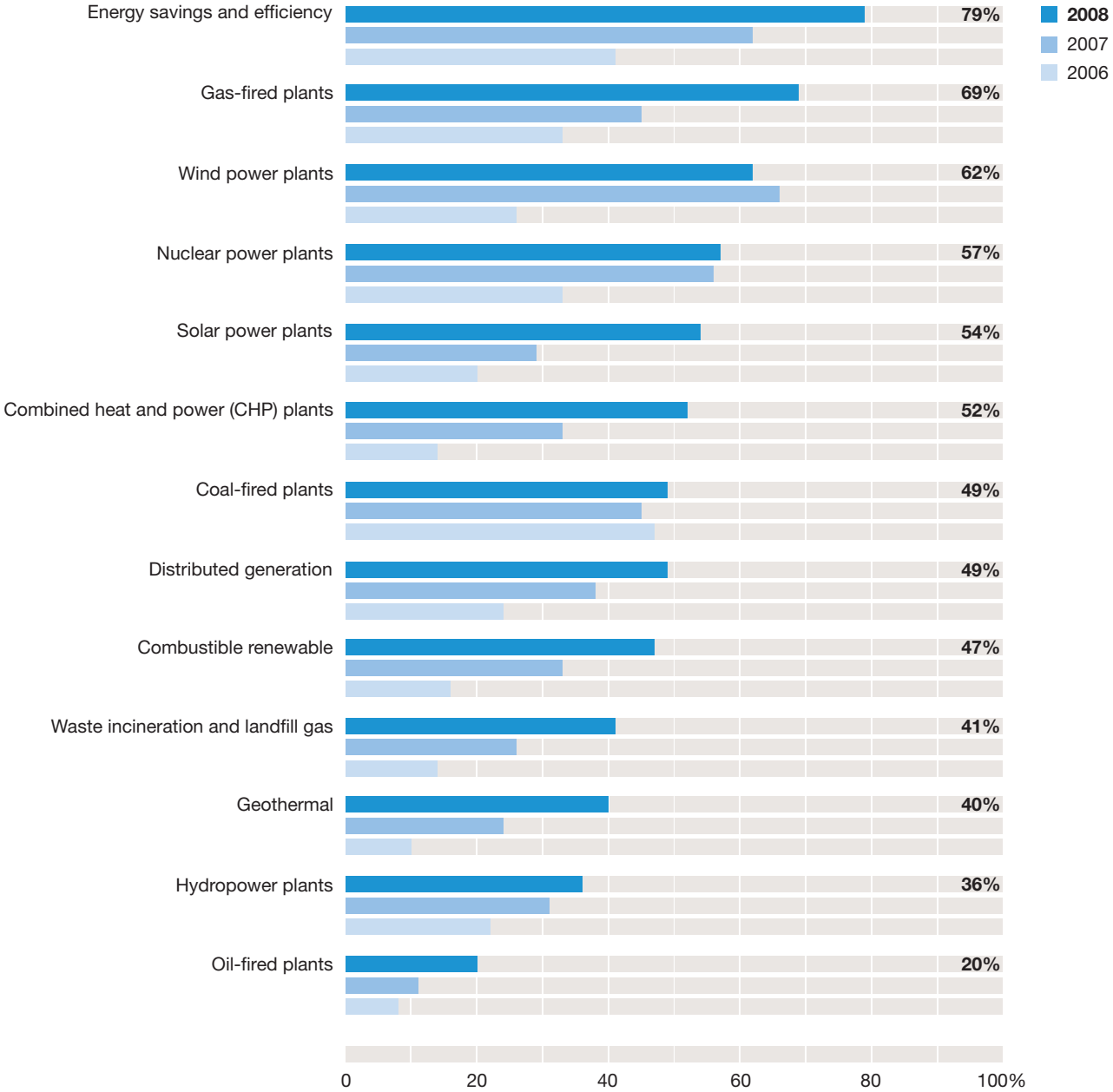



**Note:** % share of responses
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

The growing importance attached to energy saving and efficiency technology reflects a consensus that 'current business as usual' growth in energy demand and supply is not feasible. Instead, as the World Energy Congress concludes: "key drivers in all scenarios regarding the potential evolution of the energy mix are efficiency gains from stronger standards for production and end-use choices and a value for carbon which is high enough to affect choices but low enough to avoid harmful costs to growing economies" (*Deciding the Future: Energy Policy Scenarios to 2050*, World Energy Council 2007).

Our survey results indicate a fast-increasing view among utility company senior executives that a much more diverse range of energy solutions will be present in future energy markets. There are striking increases in the proportion of respondents who believe that technological developments in solar, geothermal, combined heat and power, other forms of distributed generation and a range of combustible renewables and waste power generation will have an impact in the future (see figure 11). Indeed, virtually across the board, there is an expectation that technological innovation will make a significant impact within a relatively near-term, 10 year time frame.

Figure 11: **In which areas of generation and supply do you expect technological developments to have the greatest impact over the next 10 years in your market?**




**Note:** Global responses only. % share of responses
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

## High American technological expectations

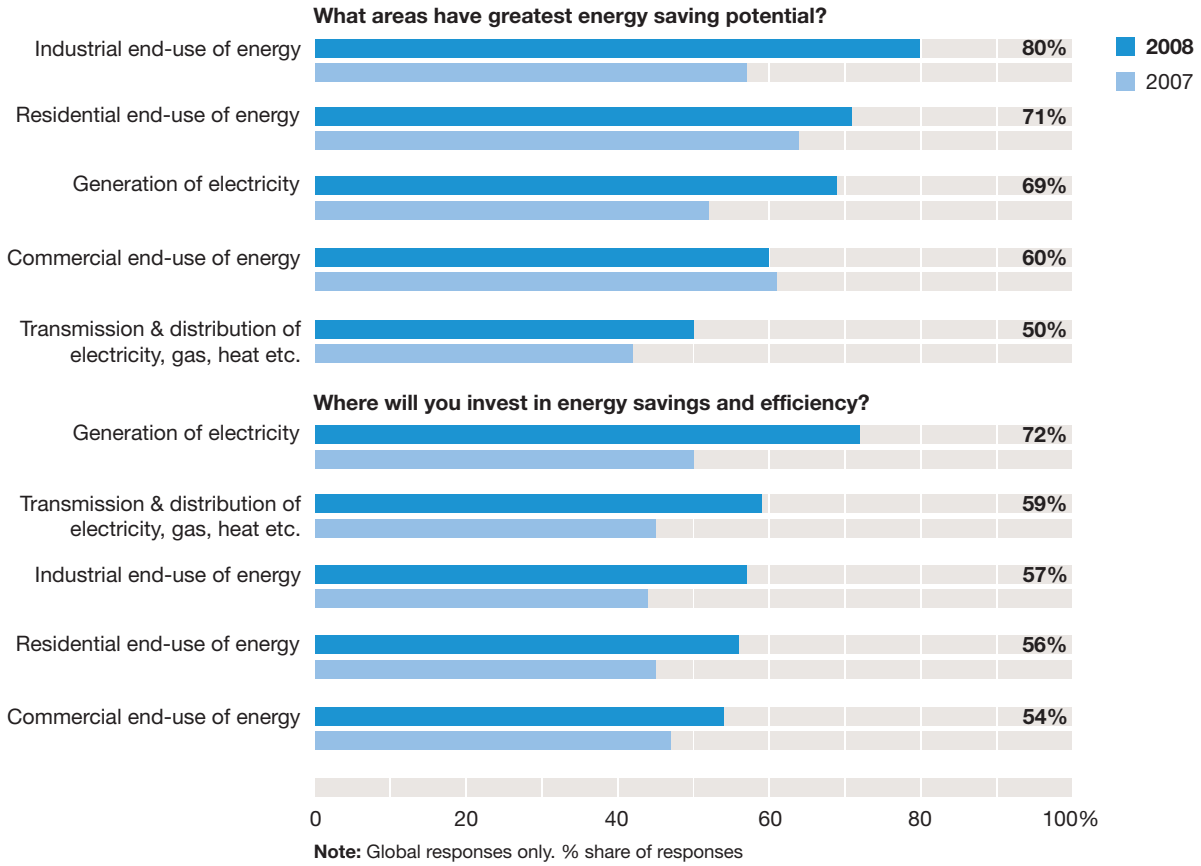
American respondents are more bullish than their counterparts elsewhere in the world about the potential impact of nuclear power, as opposed to renewable energy, in limiting the GHG growth in the next decade (figure 7). Similarly, they see more potential in the impact that developments in energy efficiency can make. Indeed, across a number of key elements of the power sector – energy efficiency, nuclear generation and wind power – American expectations about the impact of technology are strikingly more positive compared to utility executives in the rest of the word. Seventy two per cent of American respondents, for example, identify nuclear power as an area where they expect technology to have a big impact compared to 57% of global responses.

Concern about GHGs appears to be having as great an impact on American utility company investment decisions as elsewhere in the world (figure 9). However, while many American utility executives are altering project investment decisions, many of them feel that their environmental performance is yet to influence investor behaviour (figure 10). Forty-seven per cent of American utility executives felt that their company's environmental strategy and performance had had no impact on investors – far higher than the 20% of respondents in Asia and the 24% in Europe who said likewise.

## Energy efficiency in the future

Energy efficiency is recognised as an increasingly important component of energy policy. It can help alleviate supply and demand constraints and is also an important factor in the mitigation of climate change. Governments around the world are increasing their efforts to promote greater energy efficiency. Respondents to our survey signalled that their companies are also stepping up investment in energy savings and efficiency (see figure 12). They are looking both to their own processes and their customer's processes. Not surprisingly, the greatest investment is focused on their own generation plant with 72% planning investments in the next 10 years. The greatest potential, however, is seen as lying with big industrial users of electricity and 57% of respondents said their companies are planning to match that potential with investment. Across the board, the proportion of respondents recognising the potential of energy efficiency and planning to make investments has risen significantly since last year's survey.

Figure 12: **The outlook for energy savings and efficiency in your region in the next 10 years?**

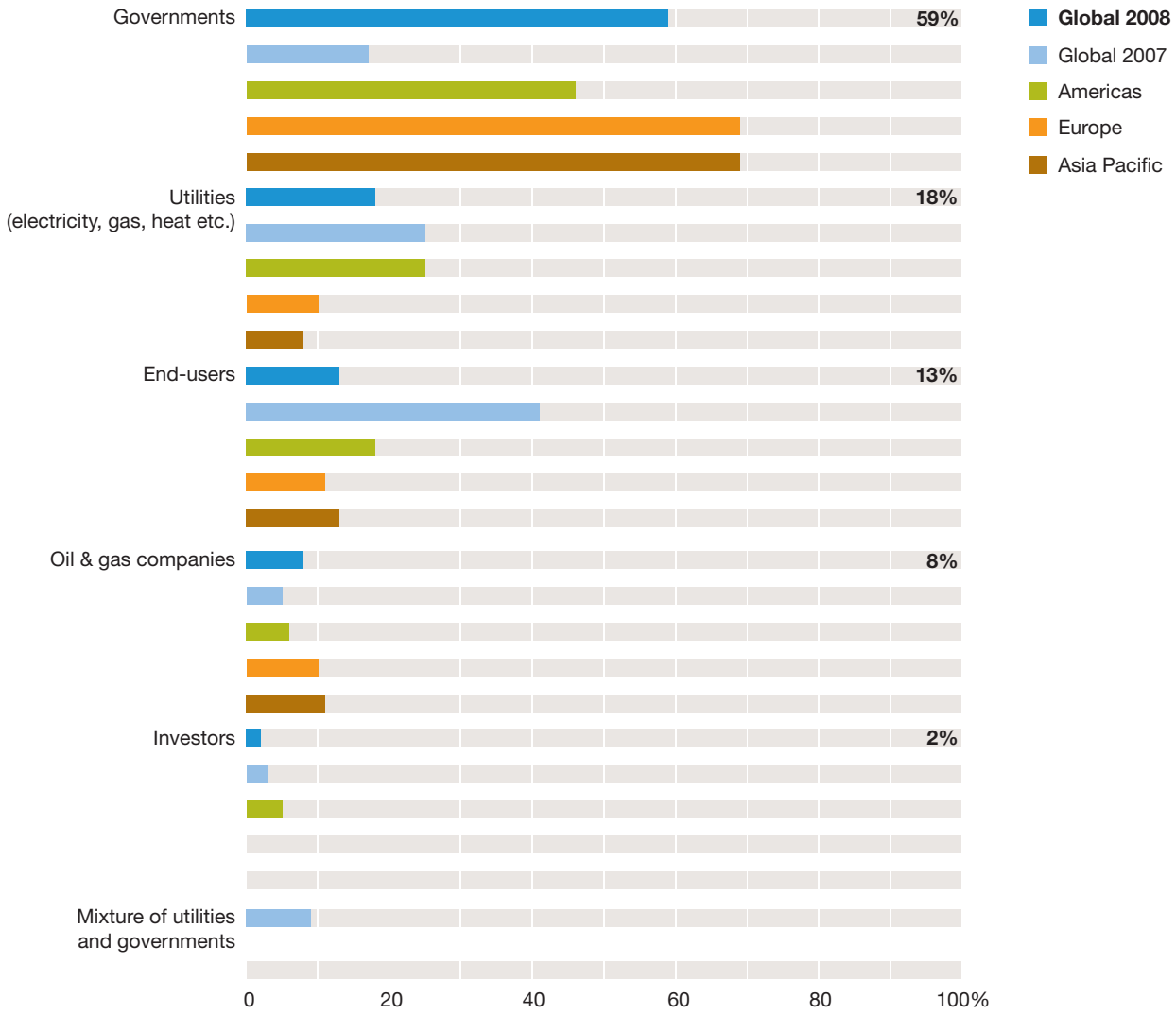



**Note:** Global responses only. % share of responses
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

However, while recognition of the importance of energy efficiency and plans to make investments appear more widespread, the view that it is for governments not the utility industry to spearhead a drive to energy saving and efficiency has hardened significantly. Nearly three-fifths (59%) of survey respondents say governments should take the lead and relatively few believe it is realistic for the momentum to come from anywhere else but governments. This is particularly strongly felt by respondents in Europe and Asia but, even in the Americas, only 25% of respondents thought that utility companies should be setting the energy efficiency pace.

Economic signals, in the form of higher energy prices stimulating end-user savings and financial incentives to invest in energy efficiency measures, will play a key role in determining the extent to which greater energy efficiency becomes a reality. The big question mark is whether governments will have the will to allow a higher price environment and invest in the necessary financial incentives.

Figure 13: **Who should take the lead in achieving energy savings and efficiency in the next 10 years?**



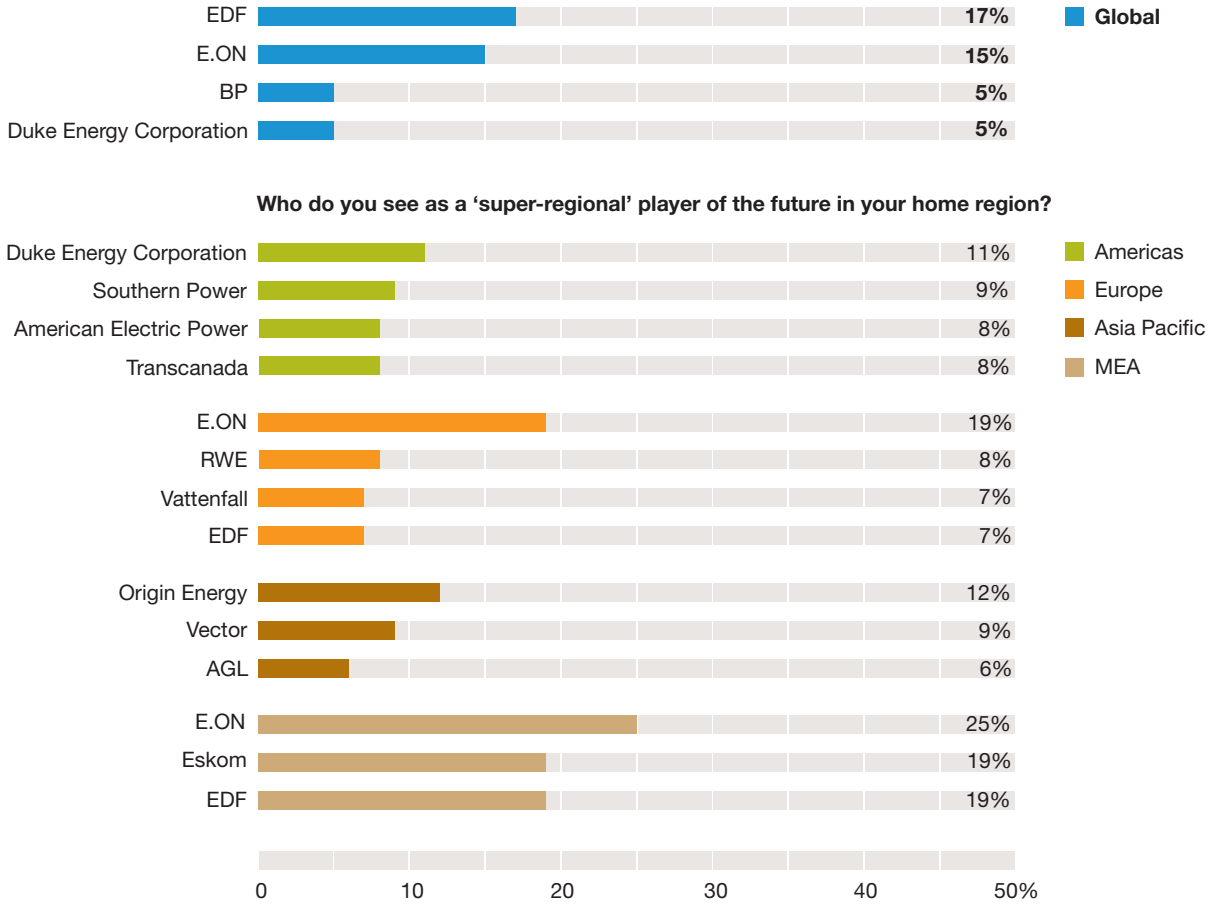

**Note:** % share of responses
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

## Companies of the future

Consolidation and the pursuit of pan-continental and international market scale continue apace among utility companies. M&A activity in the sector has scaled new heights. Our *Power Deals 2007* publication reported that the total value of power utility deals soared to US$372.5bn, nearly nine times above the US$43bn recorded just four years earlier in 2003. For the second year running, respondents to this survey scored the 'acquisition of skills and knowledge' as the strongest driver of their companies' M&A activity, highlighting the global shortage of skills in key areas of the power utility sector. This factor, together with imperatives such as market scale, vertical integration, fuel mix and outside investor interest, is likely to keep M&A fundamentals strong in the sector. In addition, as we discussed earlier, moves between utility companies and those outside the traditional boundaries of the sector cannot be ruled out.

International expansion is also an important goal for many companies. Thirty-two per cent of all survey respondents said their company intended to move into new countries as a response to competitive pressures in their markets. On this front, US companies appear to be more ready than in previous years to look across the Atlantic to Europe for expansion. Eighteen per cent of survey respondents who were looking to expand in Europe were from American companies – up from 8% in 2007. Conversely, 10% of those seeking expansion in the Americas were European. Of those with plans to expand in the Asia Pacific region, 6% were American and 16% European.

Figure 14: **Who do you see as the leading player(s) globally?**




**Note:** % share of responses
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

We asked utility executives which of their peers they expected to emerge as the leading company globally and to be the 'super regional' company of the future in their home market (figure 14). As in previous years, it is European companies, EDF and E.ON, who lead the list. EDF resumes its position at the top of the list which had been taken by E.ON for one year only in 2007. However, in Europe, E.ON continues to take the lead, perhaps in recognition that the company gained significant assets in the fall-out from its failed bid for Endesa. The successful bidder, Enel, was named as a leading global player by 3% of respondents and the same percentage named Gazprom and RWE, both of who attracted 5% of mentions last year. The growing size and increasingly evident strategic intent of E.ON and EDF is also reflected in an increasing profile for these companies outside Europe, as evidenced by their appearance among companies mentioned by survey respondents in the Middle East and Africa.

## M&A fundamentals are likely to stay strong in the sector.

**A world of difference**
PwC at the heart of industry change

## Electricity market reform in India

The electricity industry in Andhra Pradesh is the second largest in India in terms of consumers (15 million), and the third largest in terms of sales (38 TWh). However, the Andhra Pradesh State Electricity Board (APSEB), an integrated electricity utility, faced a legacy of difficulties that had built up from the mid-1980s. Government policies to promote power access at the time led to rising cross-subsidy. Growing losses led to reduced investment, power shortages and large industrial customers setting up independent generation. Price decontrol in many sectors of the economy in the 1990s caused utility input costs to rise without corresponding electricity tariff increases. APSEB was also slow to upgrade its internal systems, leading to commercial leakages and a build-up of debtors.

Against this background, APSEB embarked on an extensive restructuring programme in 1998/99 and an independent regulator (the Andhra Pradesh Electricity Regulatory Commission (APERC)) was constituted. PricewaterhouseCoopers was engaged at the start of the restructuring process to advise the state government and the APSEB. APSEB was unbundled into two companies – a generating company and a network company (which was shortly then unbundled into a transmission company and four regional distribution companies).

The restructuring was concluded smoothly and in a record period of time. Following the restructuring, we were involved in advising on the Power Purchase Agreements between the successors and in advising on the pension fund requirements and the options to finance the shortfall. Subsequently, PwC was engaged to support APERC, the newly constituted independent regulator. The engagement led to several landmark initiatives, as below:

- In the period 2000-03 we assisted in evolving the basic framework and developing internal capacity with regard to licensing, tariff reviews, technical codes, performance standards, monitoring and review, and initiated consultations for several structural changes to follow. From 2003 to 2006, we assisted in implementing the structural changes, including the introduction of open access and retail competition and setting in place multi-year tariff controls.
- Following the Electricity Act 2003, we advised the regulators on the implementation of retail competition, including assessing the utilities' readiness, separating the wires and supply functions, drafting the interim market rules and the balancing and settlement code.
- Advising APERC on the introduction of India's first multi-year price controls for the transmission and distribution companies to replace inefficient comprehensive annual reviews.
- Unwinding the cross-subsidy, built over the years, was a key challenge for the regulator. We responded by developing a flexible scaled tariff that reduced cross-subsidy (by 41% over the period), so that the reduction was compensated by growth (industrial consumers switched back to the utilities, boosting sales by 77%).
- Assisting the regulator in managing the large volume of data and providing meaningful and periodic analysis on quality of supply, licensee performance, tariff revenues and other user-defined reports. We helped develop a regulatory information system using data mining techniques. This reduced staff time spent in routine data management, standardised outputs and enriched the scope of analysis.

With survey respondents putting so much emphasis on technological innovation to deliver improvements in energy efficiency and reduced emissions, we decided to hear the viewpoint of some of the leading power equipment and technology suppliers to the utility industry.

Not many Chief Executive Officers (CEOs) use a Hollywood movie to describe the outlook for their industry but Steve Tritch, President and CEO Westinghouse Electric Company, memorably summarised the fortunes of the nuclear power sector: "there is a great line in the American film, *Paint Your Wagon*, when Lee Marvin's character reflects, in a rare moment of sobriety and motivation, that … "there's only two kinds of people in the world: them going somewhere, and them going nowhere". For a good part of the 1980s and 1990s, the second half of that quote was, to varying degrees, applicable to many segments of the commercial nuclear power industry. Today, though, the pendulum is swinging in a better direction…"

## Forces of change

The pendulum has certainly swung back not just for nuclear technology providers but also power equipment and services companies more generally. A key factor, of course, is the burgeoning growth in energy demand.

"Beside overall demand growth, concerns about security of supply and climate change are boosting growth in renewables, nuclear, clean coal and other clean or sustainable generation technology", says Wolfgang Dehen, Sector CEO Energy and Member of the Managing Board of Siemens AG. His company, one of the leading equipment providers in the international power generation sector, points out that growth is taking place, not just in a range of generation technologies, but in other key parts of the industry value chain. Looking ahead, Wolfgang Dehen, says "the importance of supra-regional power transportation will increase. Intelligent buffering and control of power grids in order to increase capacities will become more important."

Mark Coxon is Chief Financial Officer (CFO) of Alstom Power Systems, Alstom's sector responsible for power plants and equipment. He points out that "the age of the installed fleet is another driver. The fleet that is already installed is getting older, losing efficiency and we are seeing companies, utilities and state governments looking to renew the installed base." He singles out environmental concerns as a major factor changing the dynamics for technology providers. "We see increasing pressure now but certainly we'll see it over the next ten years," says Coxon. "Generating clean power will be absolutely critical in the market place if any of the governments and companies will have any chance of hitting some of the targets that they are talking about in terms of $CO_2$ reduction."

Areva specialises in nuclear power, electricity transmission and distribution technology. Alain-Pierre Raynaud, CFO and member of the Executive Committee for the AREVA group, also highlights climate change and demand growth but adds that supply security and long-term sustainability is also a paramount factor. "We are seeing tremendous growth coming for utilities in terms of volume," says Raynaud, "but also a strong drive by utilities to secure their access to resources. Uranium prices have increased and stabilised at a high level. The duration of the contracts we are entering into with utilities now are longer and the terms and conditions are more favourable than in the past in terms of escalation prices for instance."

## Industry structure and integration

The twin-track desire to secure upstream fuel resources and downstream markets was highlighted by the 2007 purchase by Kazakh state-owned uranium producer, Kazatomprom, of a 10% stake in US nuclear power plant builder Westinghouse Electric which is owned by the Toshiba Corporation. As part of the deal, Toshiba and Kazatomprom identified various opportunities and agreed to study specific collaboration projects as strategic partners. It enables Toshiba access to valuable uranium supplies for Westinghouse and helps Kazatomprom move closer to its ambition of transforming itself into a global company involved in all aspects of the nuclear power generation cycle.

"Westinghouse can bravely build reactors knowing we will stand behind them with our uranium," said Moukhtar Dzhakishev, Kazatomprom's president. "But this is a strategic partnership, not a portfolio investment. We don't need dividends from Westinghouse, we need the services they can provide."

As more countries worldwide decide to ramp up plans for new nuclear power plants, the potential for more partnerships, alliances and actual acquisitions is significant. Asked if he sees scope for some of the traditional boundaries being crossed between utilities, oil and gas, mining and technology suppliers, Areva's Alain-Pierre Raynaud says: "my personal opinion is to answer yes. If you want to be a big player in these sectors you have to cover the whole cycle. That means reinforcing alliances, partnerships or mergers at different levels. I think there will have to be consolidation among utilities due to the tremendous level of investment they have to fund and we will have some key worldwide players. Among them you might have, say, German and French utilities and certainly a North American one. Perhaps also Indian and Chinese players."

At Alstom, Mark Coxon's colleague, Denis Cochet, Head of Sales of Power Systems, reinforces the view of an industry becoming more global: "because the market is quite stretched in term of resources, the reaction of the large utilities is to try to globalise their business. Instead of investing plant to plant and seeking offers from suppliers on a plant-to-plant basis, they are now using a fleet approach and asking for five, six, ten power plants in two or three various countries to try to lock in the suppliers and optimise the supply chain."

But Cochet also emphasises that the global model will sit alongside national models: "the more the supply of electricity becomes critical in a particular country, I believe the less the government and the country authorities will leave this type of thing to external foreign investors, particularly in some developing countries. So I am a bit afraid that there we may see some form of protectionism reappearing."

## Climate change outlook

Moving back to the challenge of reducing $CO_2$ emissions, what are the prospects for success? Alstom's Mark Coxon points to the response to previous emission targets: "whenever governments and regulation authorities put economic boundaries and guidance to companies, industry typically reacts positively and finds a solution. We've seen this happen for SOX and NOX emissions in the past and there's been a significant investment by our customers in that clean-up equipment." But he emphasises the need for clear economic signals: "unless governments put that framework in place then utilities are not going to rush out and buy $CO_2$ equipment just because they think it's a good idea. There needs to be an incentive which industry can react to if they are going to make that investment. There needs to be some kind of saving for them to be able to justify putting money into the retrofit of their existing fleet or into a new power station."

Coxon also stresses the importance of long-term regulatory certainty "because companies need to know the market rules they will be competing under for the next ten to twenty years when justifying the investment for a retrofit or new plant." Siemens' Wolfgang Dehen adds that investment in efficiency will be vital: "To achieve national and worldwide goals for emission reduction we need to increase efficiency along the entire chain of energy conversion – from the extraction of oil & gas via power generation to the transmission and distribution of electrical energy."

The call for greater certainty reminds us that, while Lee Marvin's character in *Paint Your Wagon* may have said that "there's only two kinds of people in the world: them going somewhere, and them going nowhere", he might also have added that their direction of travel, in the power utilities sector at least, is heavily determined by the market structures and incentives that governments put in place.

**Sources:** Westinghouse – Westinghouse World View, October 2007; Alstom, Areva and Siemens – PwC interviews; Kazatomprom – Financial Times, February 19 2008.

American utility company senior executives are more bullish about future technological progress than their counterparts elsewhere in the world.

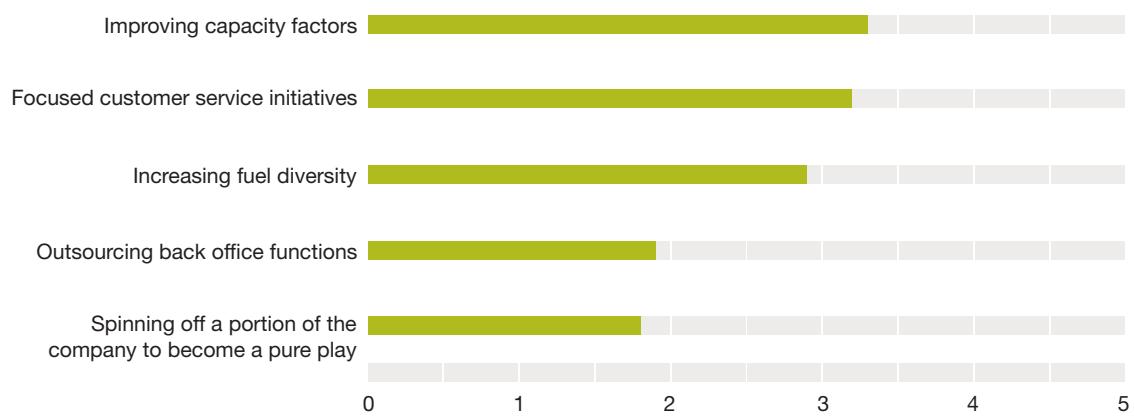
# United States

Fundamental operational matters are playing a more prominent role in US utility company priorities. Whether it is plant capacity and maintenance, customer service, long-term capital projects, rate case preparedness, or environmental/climate change readiness, 2008 is shaping up to be the year of the 'operator'. The main focus for US senior executives in our survey is on matters such as improved customer service and increased generation, transmission and distribution capacity, rather than on M&A or strategic restructuring moves. Such moves underpin rather than dominate this year's survey responses. Nonetheless, M&A and restructuring is likely to be an important part of many company strategies as they respond to deregulated market opportunities and pursue synergistic consolidation.

## The drive to deliver extra value

Utility company managers are looking with renewed urgency at the best options to more effectively manage and maintain 'utility plant in service'. In terms of plant maintenance and operations, companies are increasing training, retaining new skills, implementing more effective procurement practices, deploying standardised supply chain processes and systems, embracing portfolio maximisation modelling techniques and improving plant performance information. Managers recognise the exponential impact of an extra percentage point of capacity and are exploring all options to consistently deliver at higher levels. When asked about their strategy to enhance shareholder value, the respondents to our survey cited 'improving capacity factors' as their primary focus (figure 1).

United States Figure 1: **What is the focus of your company's strategy for enhancing shareholder value?**




**Note:** Average response. Rate where: 5 = greatest focus; 1 = least focus
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

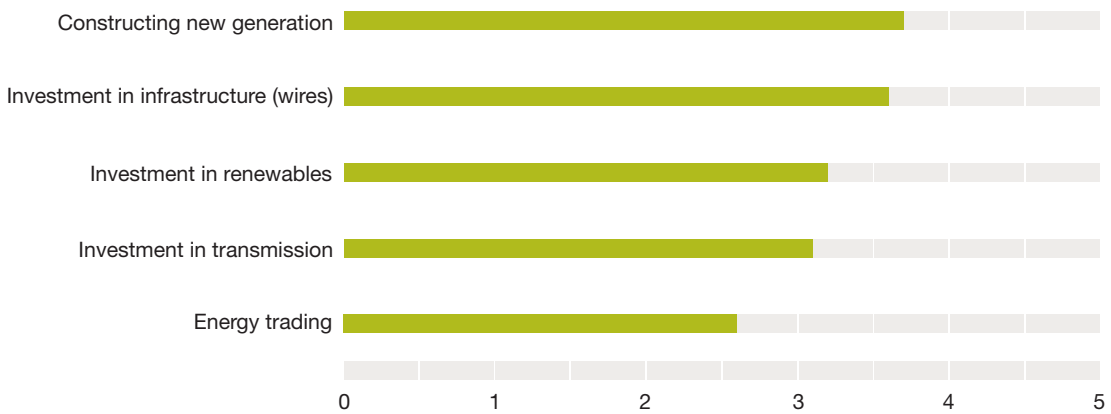
Similarly, utility managers are seeking new ways to provide better and more efficient customer service. This is reported as going almost hand in hand with 'improving capacity factors' as a means of delivering shareholder value (figure 1). Investments are being made in new and information-rich customer billing systems. Advanced metering infrastructure (AMI) and other smart meter/grid technologies are either being explored or implemented by nearly every large-scale utility. Improved customer cost and service information is being captured and acted upon. Utility managers also appear more aware of additional costs that are often driven by a minority of the customer base and they are more cognizant of the regulatory and customer care issues (and costs) that can arise when service levels do not achieve desired targets.

As such, 'focused customer service initiatives' closely follow 'improving capacity factors' as the utility industry survey respondents' most likely approaches to enhancing shareholder value. Increased fuel diversity is also cited as an important route to more shareholder value (figure 1). The importance of greater fuel diversity is partly driven by the need to secure supply and avoid overdependence on a narrow range of fuel sources, but is also influenced by climate change concerns.

## A focus on major construction and infrastructure

Large-scale construction and other capital projects began increasing at a rapid pace from 2006 onwards. This trend has continued into 2008 with the announcement of many new projects. These investments are driven by a number of factors. Transmission congestion, carbon and other government environmental initiatives, increased demand in certain markets and the need for greater reliability are among the common issues most often cited by utility managers. The construction of new generation heads the list of priorities for survey respondents in the coming year and investment in generation, transmission and distribution infrastructure are viewed as key to strategic growth (figures 2 and 3).

United States Figure 2: **What are your company's strategic growth opportunities?**



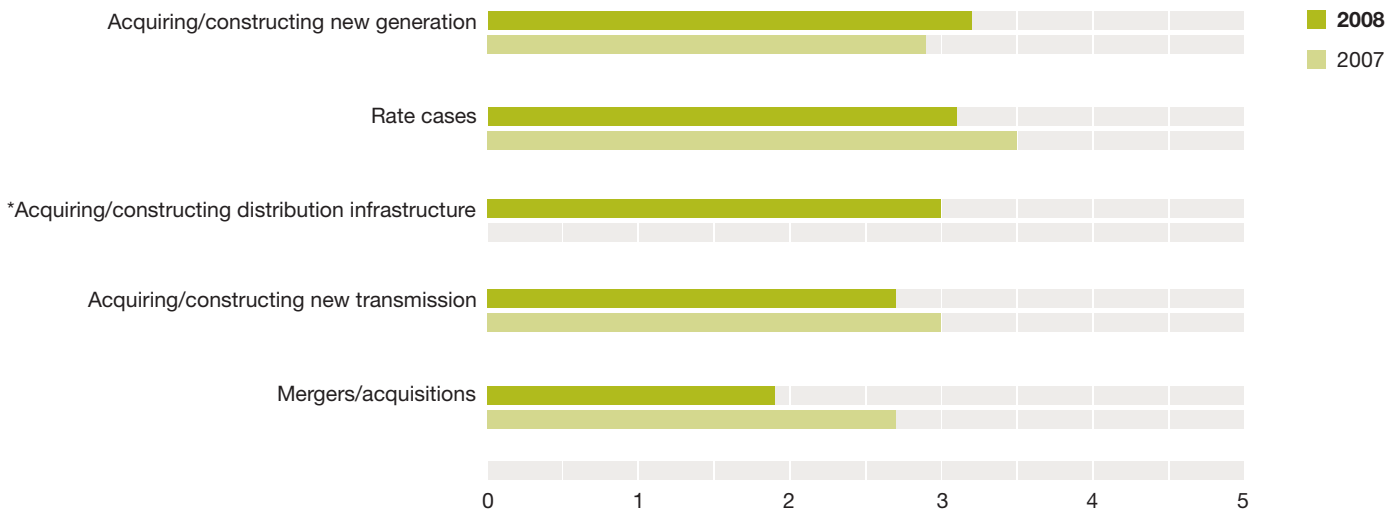

**Note:** Average response. Rate where: 5 = most strategic; 1 = least strategic
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

In last year's survey, utility managers were asked to identify the most significant risk created by this large increase in construction activity. While several matters received high ratings, 'the potential for cost overruns and construction delays' was rated highest. As expected, many utilities have now adopted rigorous construction project and risk management programmes. These efforts will help ensure matters of importance are anticipated, related risks are mitigated and opportunities are appropriately exploited.

Rate cases continue to receive significant management attention as new construction increases the rate base and combines with an escalating cost-of-service. Once again, survey respondents indicated that a major emphasis over the next year will be on securing appropriate new rates (figure 2). Regulatory challenges are likely to continue and adequate preparation for prudence reviews, cost allocation scrutiny and rate deferrals are expected to remain a priority.

The construction of new generation heads the list of priorities for US survey respondents in the coming year.

United States Figure 3: **Over the next year, what will your company's focus be on?**

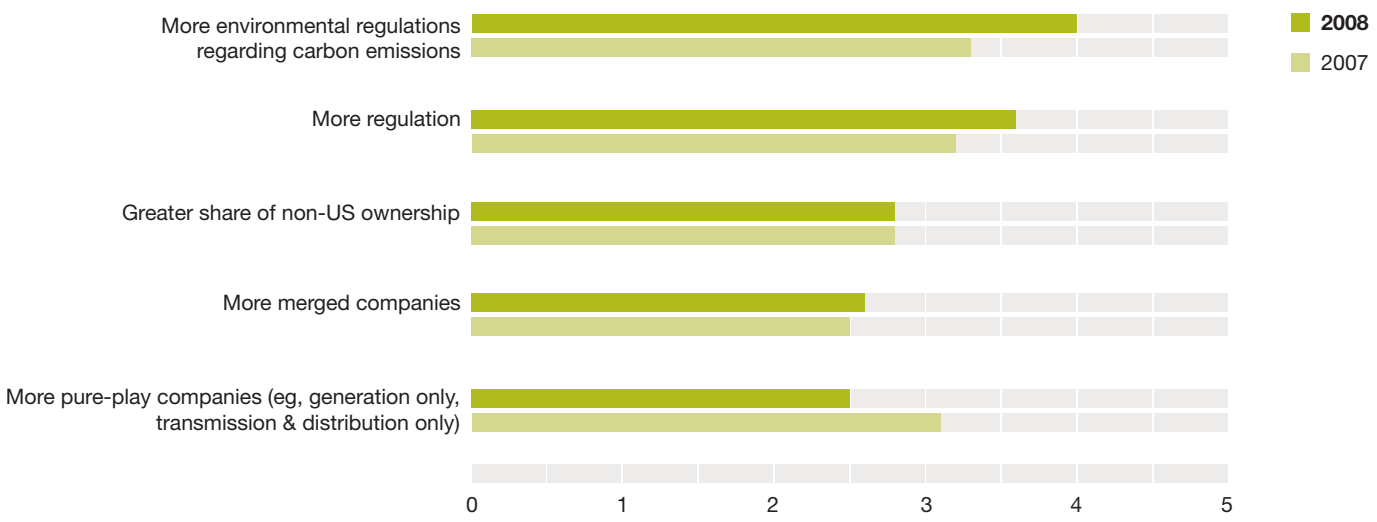



**Note:** Average response. Rate where: 5 = most focus; 1 = least focus
*Question not asked in 2007
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

## Emissions – the big change issue

Looking ahead, US utility company senior executives are in no doubt that prospective federal legislation limiting carbon emissions will be the biggest change affecting the industry in the next five years together with an overall increase in regulation (figure 4). Most industry managers are no longer wondering if there will be federal carbon legislation passed by the next administration. Instead, they are now debating how such legislation should be structured, either as a carbon tax or as a cap and trade programme.

United States Figure 4: **What will be the biggest change in the US utility industry over the next five years?**

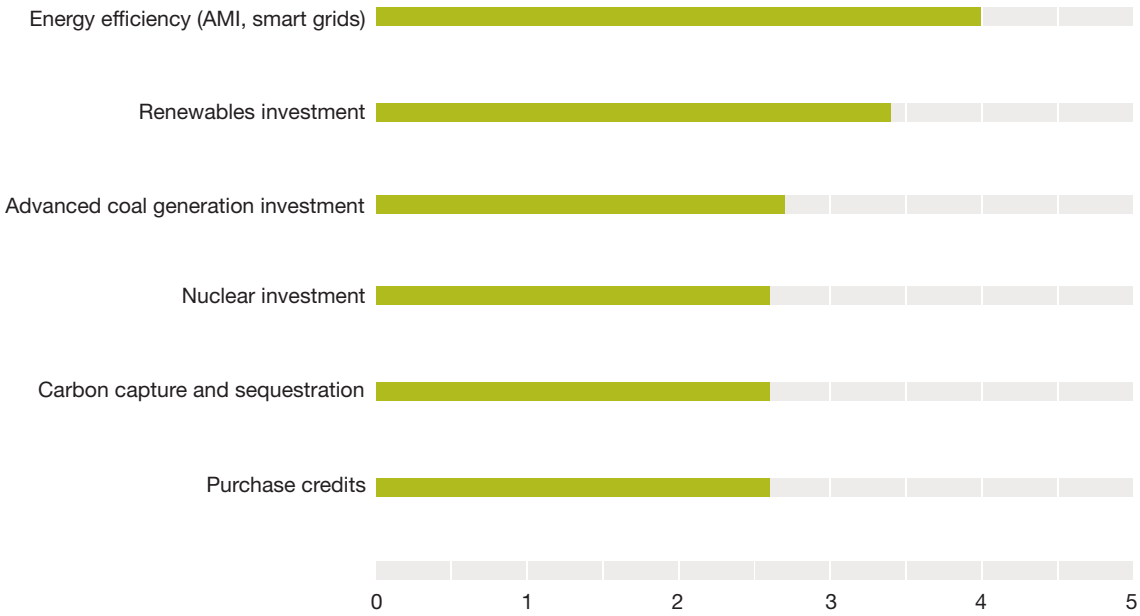



**Note:** Average response. Rate where: 5 = most change; 1 = least change
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

It is now no longer a question of if there will be federal carbon legislation but how such legislation should be structured.

As we saw on page 16, American respondents are more bullish than their counterparts elsewhere in the world on the prospects for technological innovation helping to mitigate GHG emissions. To manage environmental demands, utility managers plan to make a range of technological and generation investments, headed by 'energy efficiency' technologies such as AMI and 'renewables' (figure 4). As we saw in responses to our question on shareholder value, 'increased fuel diversity' is an important part of utility company strategic plans (figure 1). The sizable costs of such environmentally-driven investment and diversification, allied with the related construction risk, mean companies and regulators will need to collaborate thoughtfully to ensure shareholder and ratepayer interests are equitably maintained.

United States Figure 5: **What is your company's strategy for dealing with climate change, carbon credits and other environmental issues?**




**Note:** Average response. Rate where: 5 = most important; 1 = least important
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

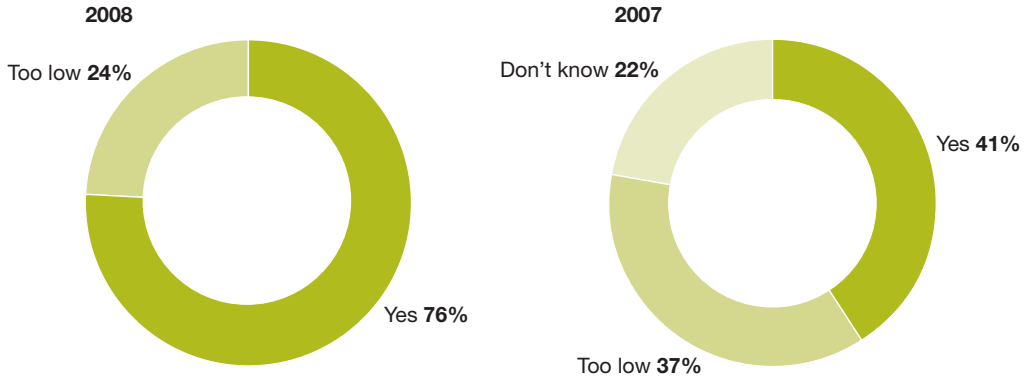
## Utility stock outlook

Each year we ask utility company senior executives whether their stock is appropriately valued and what movement they expect over the next 12 months. In the past, respondents have been accurate in their projections. Last year, over a third of respondents felt the market was undervaluing their companies and only 41% felt their stock was appropriately valued. This year the feeling is that the market has caught up with only a quarter (24%) believing their company is undervalued and three-quarters (76%) indicating the price is right. The outlook among respondents is bullish with 76% expecting utility company stock prices to rise in the coming 12 months – up from the 59% who expected such a rise last year.

## The impact of IFRS

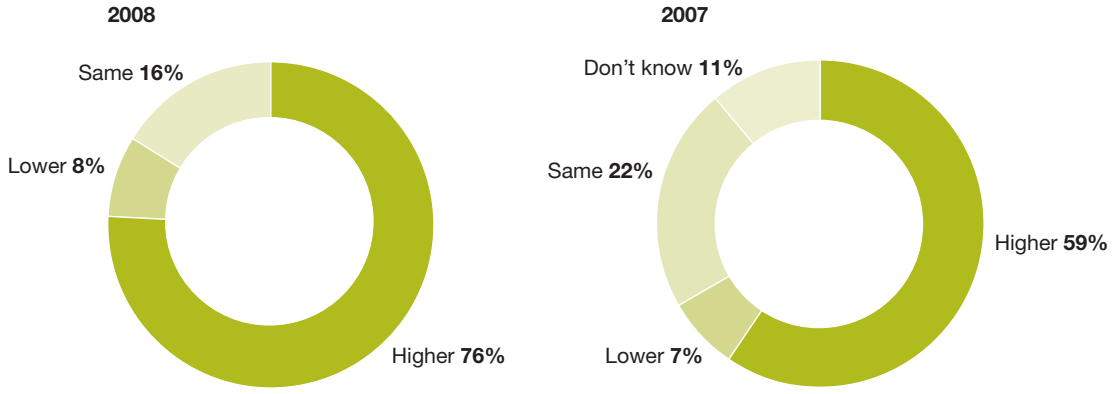
Increasingly, International Financial Reporting Standards (IFRS) are how most of the world talks to investors and other stakeholders about corporate performance. The US Securities and Exchange Commission (SEC) is studying whether US companies should have the option of reporting under IFRS rather than under US GAAP. Many expect the SEC to issue proposed rules that designate a date for optional and/or mandatory adoption of IFRS by US public companies. The speed with which a move to IFRS has progressed—from a mere possibility to inevitability—has landed this topic squarely on the radar screen of many companies and their boards. Indeed, some pioneering US companies are actively beginning the conversion process.

United States Figure 6: **Is your utility company's stock appropriately valued?**




**Note:** Average responses only. % share of respondents
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

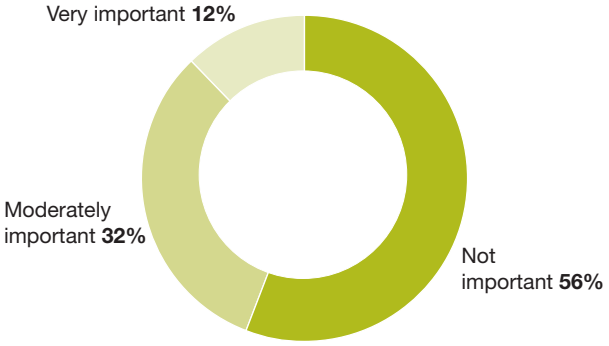
United States Figure 7: **What movement do you expect in utility stocks over the next twelve months?**




**Note:** Average responses only. % share of respondents
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

Our survey indicates that the significance of IFRS in the US is perhaps only just beginning to be felt in the power utilities industry – less than half or respondents believe a change to IFRS will be important to their companies with 56% saying it will not be important (figure 8). As the SEC continues to consider allowing or even mandating the use of IFRS by US registrants, this area will become worthy of careful observation. Increasing competition for capital and more common acceptance of the IFRS standard domestically is likely to make IFRS adoption a greater priority for US utilities.

United States Figure 8: **How important will a change to International Financial Reporting Standards (IFRS) be to your business?**




**Note:** Average responses only. % share of respondents
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

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## Smart metering in the US

PricewaterhouseCoopers is working with a leading US utility company which aims to have replaced seven million customer meters with new smart meters by 2012. In the future, customers will be able to view their detailed usage data online and take advantage of new rate options to better manage their energy consumption and control their energy bills. The initiative is a major step forward in facilitating better energy efficiency and enabling the company to pinpoint power outages and restore power faster, avoid estimated bills and identify potential service problems much more easily. Together these gains are expected to save significant sums.

PwC helped prepare the initial rate case presentation to the state public utilities commission (PUC) in 2005. In the initial stages of the project, PwC assisted the utility company with regulatory support and risk management activities including:

- Guidance for documentation for the completion of the required PUC rate case filings.
- Assisting in witness preparation for the PUC rate case testimony.
- Guidance for rebuttal testimony in response to issues raised by the PUC during rate case review.
- Developing a risk mitigation process according to the project life cycle.
- Determining the impact of risk by quantifying risk exposure.
- Re-evaluating and updating risk profiles.
- Developing contingency plans and processes for their execution.

PwC continues to be centrally involved in the development and roll-out of the project with a range of services to support the scheduling support and process design aspects of the initiative. This includes, for example, the facilitation and documentation of future state process design work sessions for meter and module deployment, new business, exception management, asset management, MDM operations, customer care and billing process groupings.

# Canada

The 2008 survey confirms the emergence of concern over greenhouse gas emissions as the major issue facing utility companies in Canada (figure 1). Most industry players have been monitoring and managing this issue for years but, in the past 18 months, the significance of this issue has increased rapidly to become a major factor in corporate and government decision-making. For example, the enormous interest in and anticipated growth of nuclear generation in Canada can be traced in large part to the GHG issue.

## Major issues

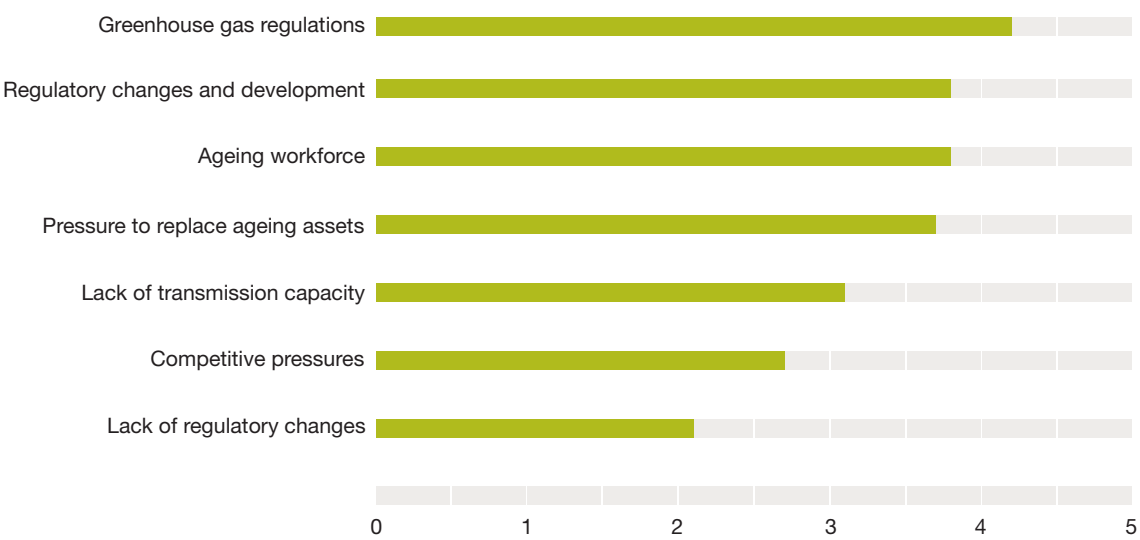
The rise in environmental concern is evident across all Canadian states. Even in Alberta, which has historically been the province most resistant to GHG regulation, the new Alberta Government's mandate for the Energy Ministry states that its role is to "ensure that Alberta's energy resources are developed in an environmentally sustainable way" and goes on to specify measures including carbon capture.

Similar responses have emerged across Canada including: significant investment in wind generation in Alberta, Saskatchewan and New Brunswick; renewed interest in hydro development; introduction of a carbon tax in British Columbia (BC); and committments by BC to make the public sector carbon neutral by 2010, local governments carbon neutral by 2012 and the entire province energy self sufficient by 2016. These industry and political responses mirror an extraordinary increase in public awareness of and sensitivity to the climate change Issue.

Climate change is far from the only issue. Other significant pressures identified by participants include the challenge of an ageing workforce. Across Canada, but particularly in the west, there is a shortage of skilled labour in many sectors. The utilities sector, like many other industries, cut back on existing staff and on hiring in the 1990s and is now facing a demographic crunch as experienced employees approach retirement age. It is far from clear how these retiring workers will be replaced.

The industry also faces major challenges in terms of investment in plant and infrastructure. Ontario, for example, needs to largely replace its generation fleet and to decommission existing facilities. Other provinces also have major generation and transmission investment requirements.

Canada Figure 1: **What are the major issues facing the utilities sector over the next 5 years?**



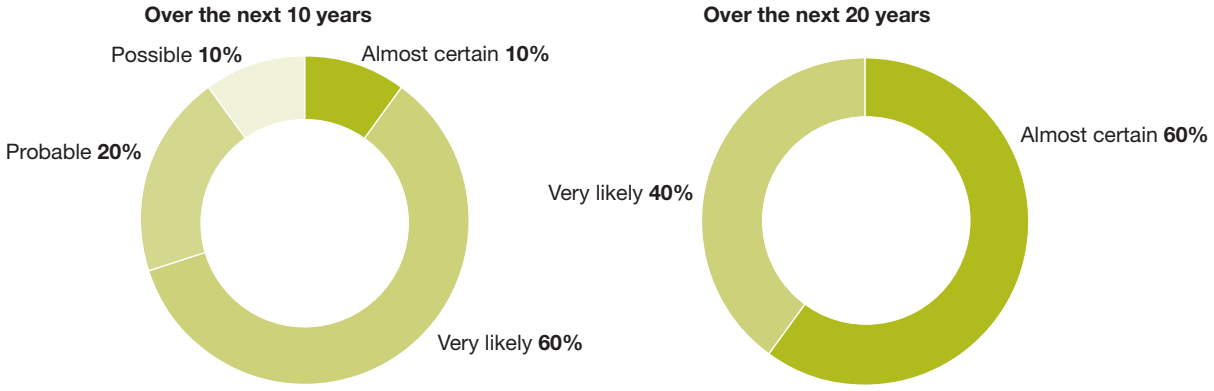

**Note:** Average response. Rate where: 5 = major driver; 1 = not a driver
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

This will create opportunities for private sector owners of generating assets, the construction business and many engineering contractors. It will create equivalent funding challenges for governments. Together with oil sands developments in Alberta (and potentially Saskatchewan), these utility sector infrastructure projects look set to create opportunities for the construction and engineering sector for many years to come. However, the barriers to new construction should not be underestimated. Proposed transmission developments in the west have come under major attack by stakeholders causing significant delays and the public debate on new nuclear construction has barely started.

## Nuclear generation

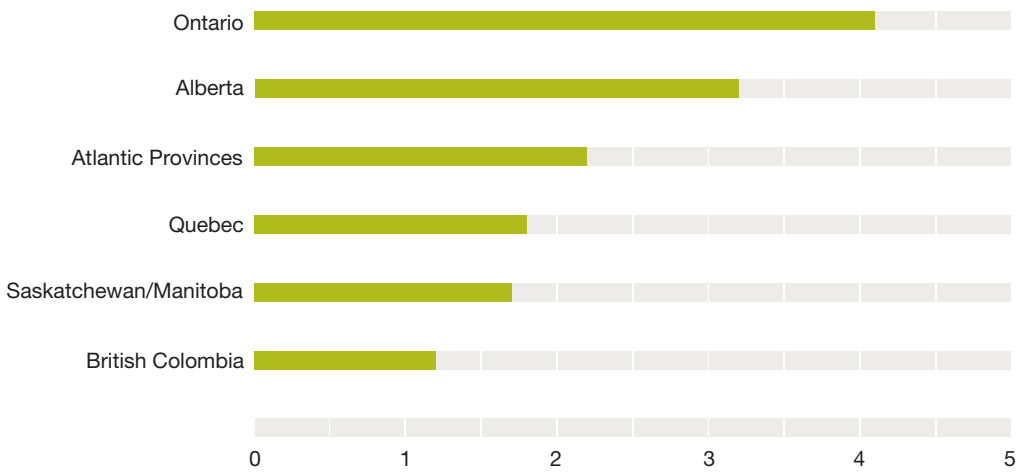
There is a strong consensus that Canada will significantly increase its nuclear generation fleet over the next 20 years with 70% of respondents anticipating this development in the next 10 years and 100% of respondents anticipating that this development is very likely or almost certain in the next 20 years.

Canada Figure 2: **What is the likelihood that Canada will significantly increase its nuclear generation fleet?**




**Note:** Average responses only. % share of respondents
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

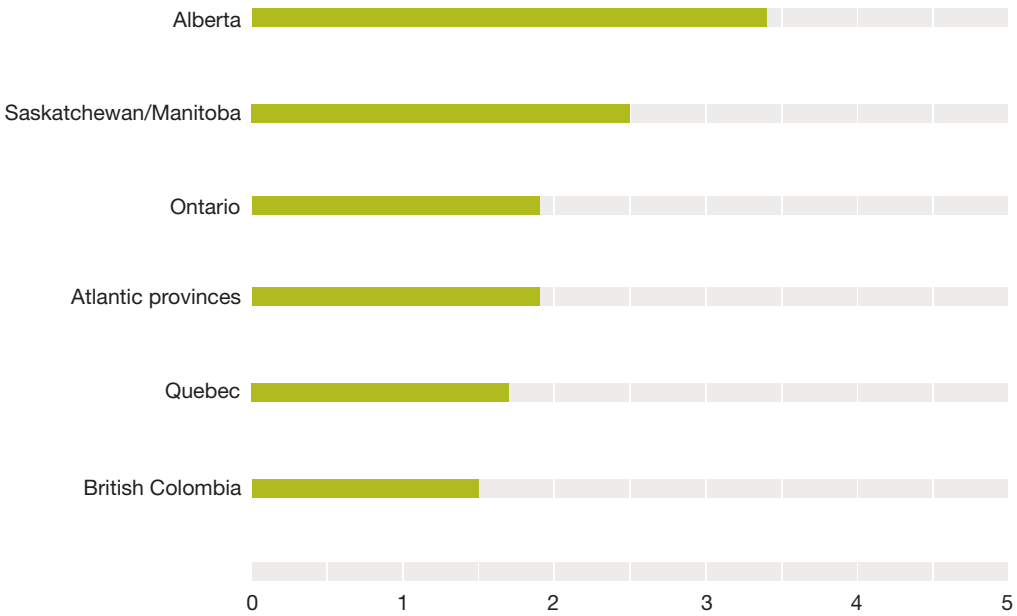
Canada Figure 3: **What is the likelihood that we will see commencement of the construction process for new nuclear operations in the following areas in the next 10 years?**




**Note:** Average response. Rate where: 5 = very likely; 1 = not likely
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

Ontario currently has most of the nuclear generation capacity in Canada and it is, therefore, not surprising that most respondents identify Ontario as the most likely location for new nuclear construction. But it is surprising that the second most likely location identified for new nuclear construction is Alberta. This is a very recent development. As recently as two or three years ago, few would have thought that Alberta, as the province with the largest reserves of oil, gas and coal in Canada, would have been a likely location for nuclear construction. But the combination of increased focus on GHG emission reduction, high gas prices and an announcement by Bruce Power (owned by TransCanada Pipelines, Cameco Corporation, OMERs and the other participants in the BPC Infrastructure Trust) that it is considering construction of a 4000Mw nuclear generating plant in Northern Alberta, has transformed this view in a very short space of time. An expansion of nuclear generation will, of course, require significant new investment and more than half of respondents thought it very likely or probable that this would come in the form of new entrants to the Canadian market.

Canada Figure 4: **What is the likelihood that we will see commencement of construction process for new advanced coal-generating facilities in the following areas in the next 10 years?**




**Note:** Average response. Rate where: 5 = very likely; 1 = not likely
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

## Coal-fired generation

Alberta has the highest proportion of coal-fired generation in Canada, so it is again not surprising, given the growth in the Alberta economy, that survey respondents anticipate new efficient coal-fired generation in Alberta. However, they assign a low probability to the development of new advanced coal generation in Ontario, suggesting that they expect the current Liberal Party policy of no coal-fired generation (even using newer, more carbon efficient techniques) to continue. Many industry participants have expressed views that it will be difficult for the Liberal Party to maintain this in the face of increased demands for power and the slow pace of generation construction.

As recently as two or three years ago, few would have thought that Alberta as a likely location for nuclear construction.

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## Eliminating billing errors in Canada

Billing errors are a major challenge for utility companies world-wide. Customer switching between companies, different contract start dates, house or business moves and the reconciliation of billed power to power purchased by the utility are just a few of the complicating factors. Multiple billing cycles mean that unbilled revenue is also part of the calculation.

An incoming vice-president at a Canadian power distribution company recognised that the process for computing unbilled revenue was not well understood in the company. Moreover, the month-end estimate of unbilled revenue had been growing for six months and the reasons were not clearly understood. The problems went deeper – the database of site records used to compute 'cost of sales' was not reconciled to the billing site record data base; there was potential for a material error on the financial statements, and there was revenue leakage with certain energised sites not being billed while other sites without energy or already transferred to another service provider were being billed.

PricewaterhouseCoopers conducted a major review of billing procedures:

- To assess the reasonableness of the current unbilled revenue determination procedures and identify potential areas for process and control enhancements.
- To perform a calendarisation of year-to-date billings for a four month period.
- To calculate unbilled revenue based on the latest billing record at two-month ends.

We downloaded one year of detailed billing data for several hundred thousand customers and recalculated billings based on a flow month basis. This information was used to complete a 100% re-analysis of life to date errors outstanding on their unbilled revenue account. We identified a significant estimation error and provided confidence in the restated estimate. We have the capacity to deal with much larger data sets if necessary.

PwC has continued to work with this client to:

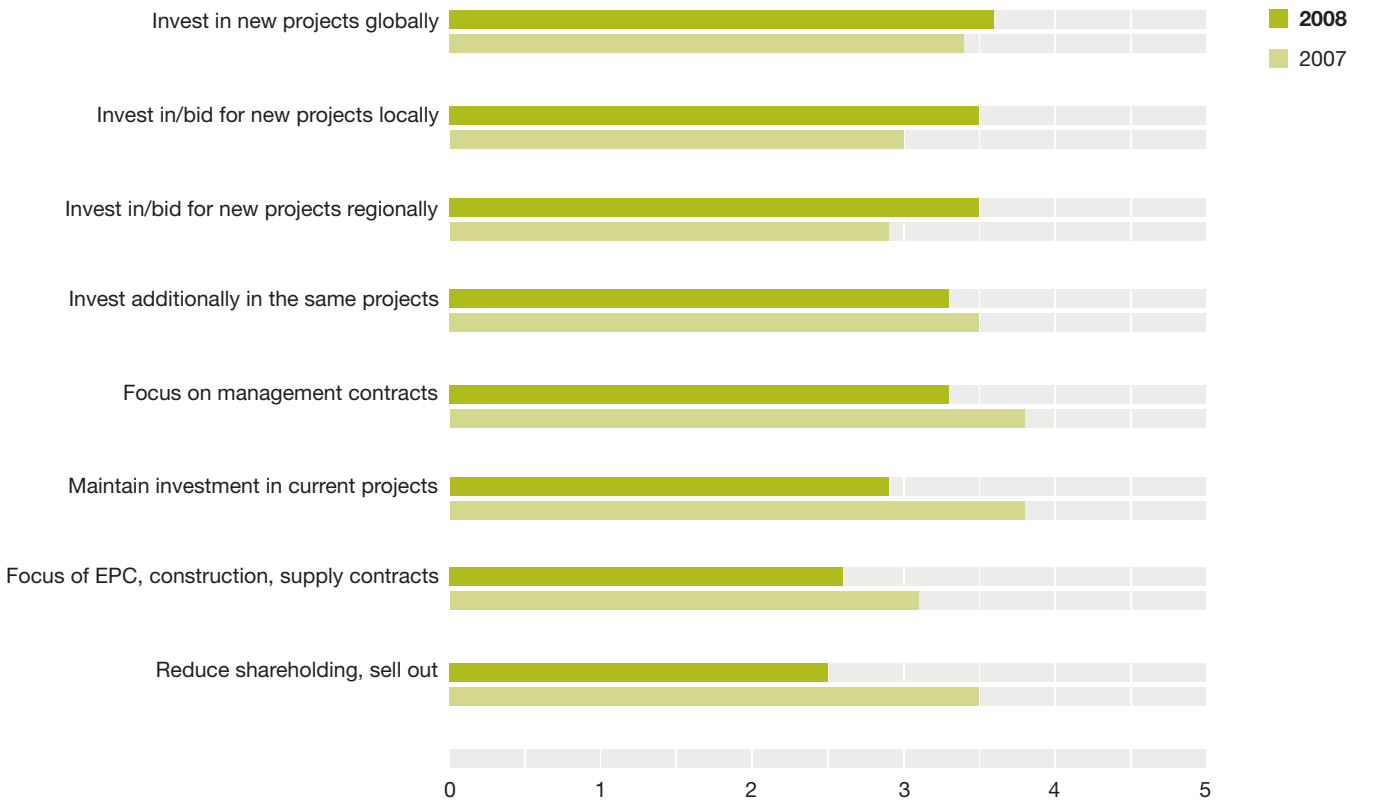
- Significantly improve revenue recognition processes and controls in both the electricity and the gas distribution business.
- Develop a plan to repatriate billing processes from an outsourced service provider.
- Develop an improved architecture for a major ERP installation.

# South America

Highly favourable economic conditions in 2007 continued the period of sustained growth that began in 2003 and which has benefited many countries in the region. This period of growth is unusual not only for its scale and duration but also in terms of the stability of key macroeconomics variables. Growth has been accompanied in many countries by balance of payment surpluses, decreased external debt and reduced poverty levels.

Economic growth has spurred demand for power. The energy supply/demand balance within South America varies considerably. Countries such as Venezuela and Bolivia, for example, have considerable gas reserves. In contrast, Chile has a shortage of energy supply. In aggregate, however, the region's gas reserves can fulfil more than 60 years of consumption but current electricity and gas markets are country-based with limited interconnections between them. There are also varying regulatory regimes in each country. The region's governments have been debating the creation of a coordinated strategy for gas and electricity supply and a potential regulatory framework is under discussion.

South America Figure 1: **What are your company's future intentions in terms of investments?**



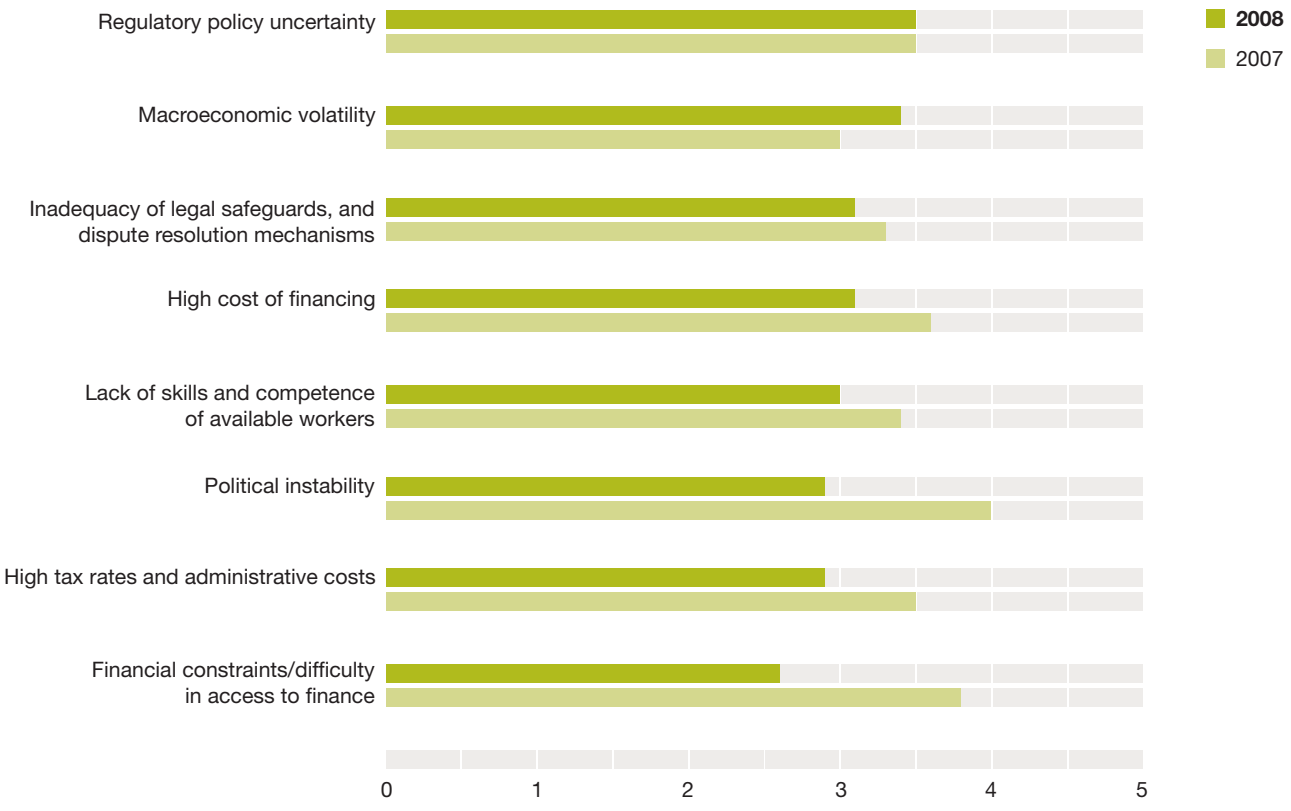

**Note:** Average response. Rate where: 5 = most focus; 1 = least focus
*Question not asked in 2007
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

## The investment outlook

The continuation of positive economic conditions, together with improved political stability in much of the region, has led to a sea change in the investment outlook for power utilities. Inward investment had been a problem in the region but local and foreign investment is now being attracted to new projects to fulfill growing domestic demand and the integration potential of the region. As figure 1 shows, utility companies are now more willing to invest in new projects, shifting away from mere maintenance of existing ventures to growth in new ones.

From being the number one investment concern for respondents to our survey last year, political instability has receded as a worry (see figure 2). Democratic transition of governments occurred in Argentina, Brazil, Chile, Colombia and Peru in the last 18 months. The strength of the region is creating a window of opportunity for those companies willing to increase their risk exposure. Financial constraints and difficulty in accessing finance has faded from number two spot last year to the least-rated concern this year. However, uncertainty about the sector's regulatory environment, including the inadequacy of legal safeguards and dispute resolution mechanisms, remains a constraint. Survey respondents are concerned about macroeconomic volatility but, given the region's recent economic performance, this may be prompted by the 'sub-prime' financial crisis in the developed world rather than events in the region.

South America Figure 2: **Which of the following does your company consider to be the main concerns facing investors in the region in the coming years?**

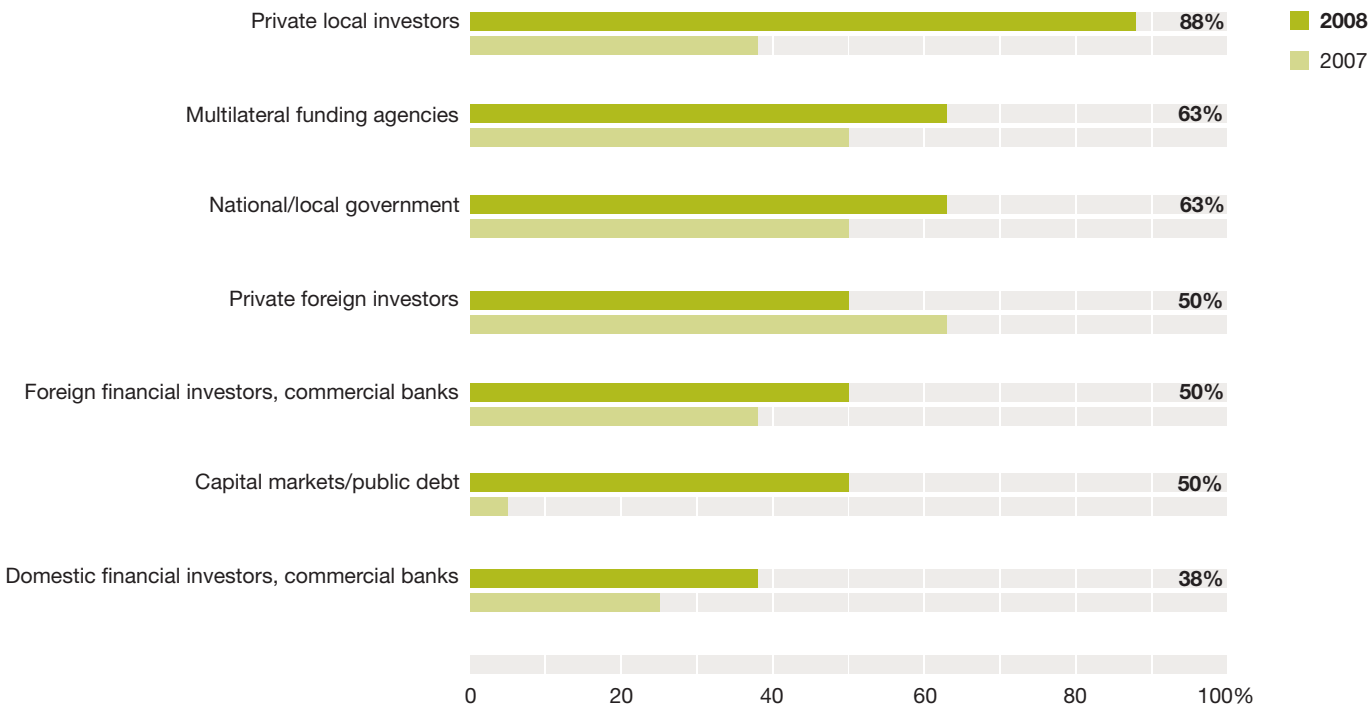



**Note:** Average response. Rate where: 5 = most concern; 1 = least concern
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

## Future financing

Almost 90% of survey respondents expect private local investors to be a source for future investment in the utility sector (figure 3). This is a huge change from last year when local investors were named by just 38% of respondents, reflecting the changing political and economic environment in the region. The proportion identifying multilateral funding agencies, such as the World Bank and other development bodies, and national and local government has also risen. This reflects the extent to which energy supply has returned to the public agenda with active policy initiatives from governments and international bodies. Nonetheless, difficulties with access to private finance remain an issue and, although the climate is improving, local banks and other financial investors are still only mentioned by a minority of respondents.

South America Figure 3: **What are you expecting to be the financial sources of future investments in the utility sector?**




**Note:** Average response. % share of responses
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

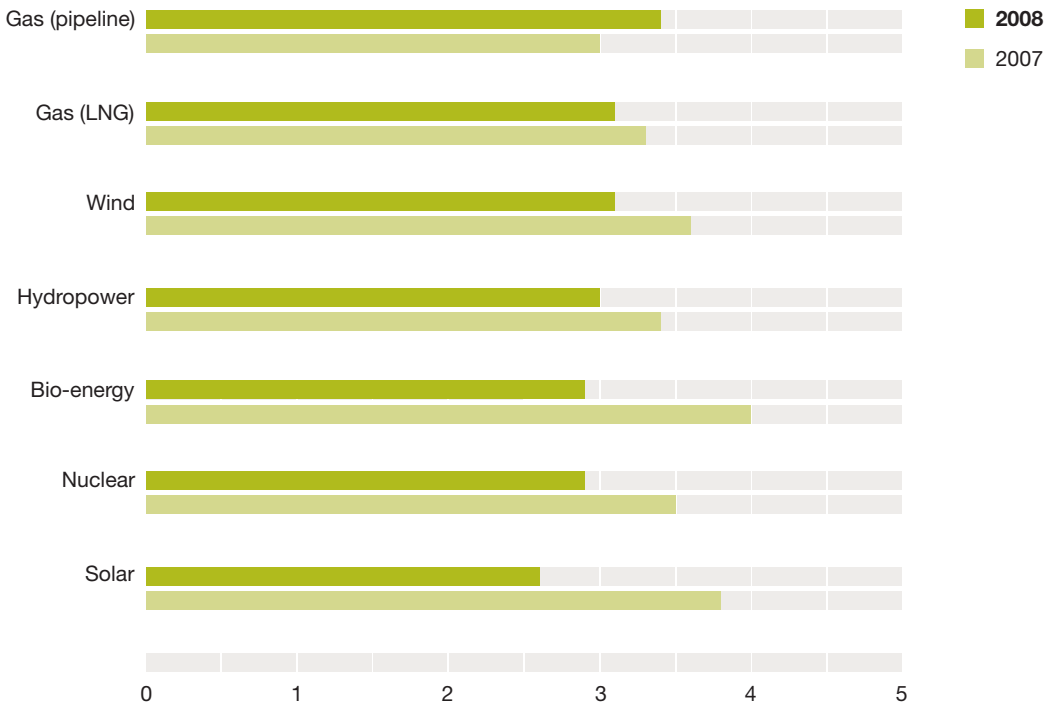
## Sustainable energy

The potential of gas in the region is reflected in a greater emphasis by survey respondents on gas (both pipeline and liquefied natural gas (LNG) as an alternative fuel source (see figure 4). In the last 18 months, significant gas reserves have been discovered in Peru, Brazil and Colombia and a number of important infrastructure projects are in progress, including:

- A connecting pipeline between Colombia and Venezuela;
- An LNG regasification plant in Quinteros, Chile;
- The GNEA project (Pipeline of the Argentine North East), which will increase trading between Argentina and Bolivia; and
- An agreement by Petrobrás to lease LNG storage and regasification vessels to supply Brazil.

Hydropower and wind remain important in the region but respondents attach less significance to bio-energy, nuclear and solar power in terms of their impact on future electricity pricing.

South America Figure 4: **Which of the following alternative sustainable energy sources do you believe will affect competitive electricity pricing in your region in the near future?**



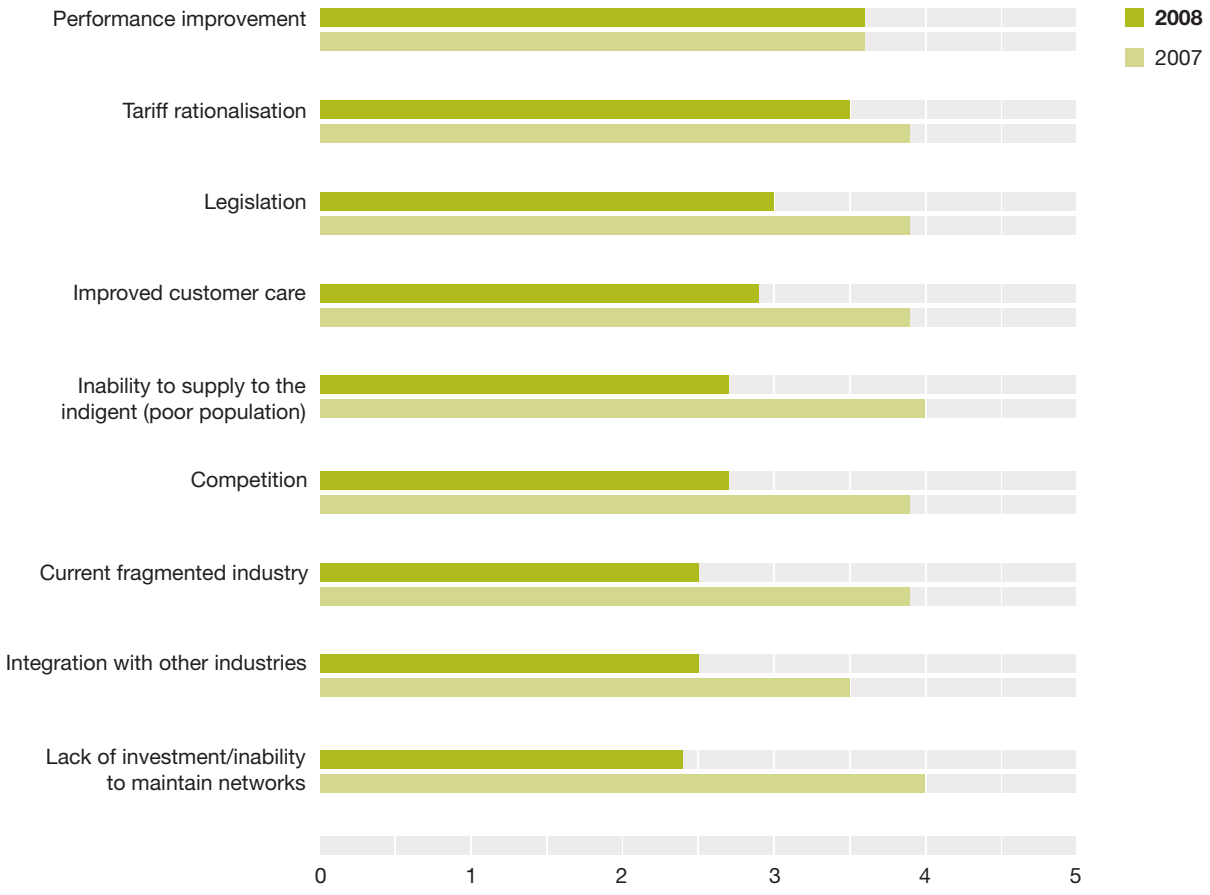

**Note:** Average response. Rate where: 5 = strongly affect; 1 = least affect
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

## Restructuring of power markets

Senior utility executives responding to our survey identify performance improvement, tariff rationalisation and legislation as the key drivers for restructuring of power generation and distribution markets in the region (figure 5). Other factors that were highly rated in the past are no longer considered to be as relevant, for example the lack of investment and the inability to maintain networks.

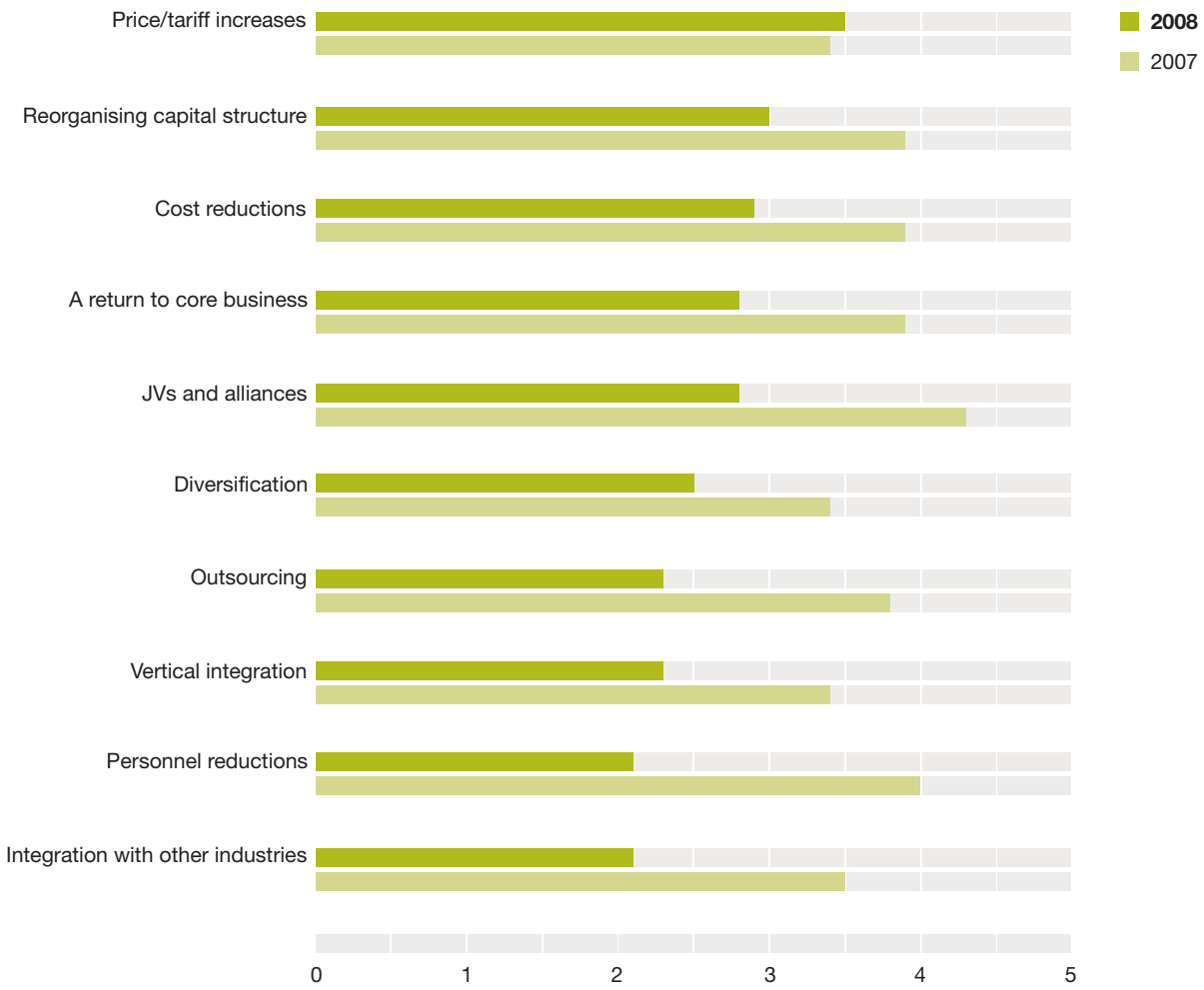
Companies are expecting increases in prices and tariffs and they are looking at reorganising capital structure as a way to improve profitability (figure 6). Personnel reductions are no longer considered a lead way to achieve this goal, maybe because major adjustments to headcount in utility companies have taken place in previous years.

South America Figure 5: **What are the key drivers for the restructuring of the generation and distribution markets?**



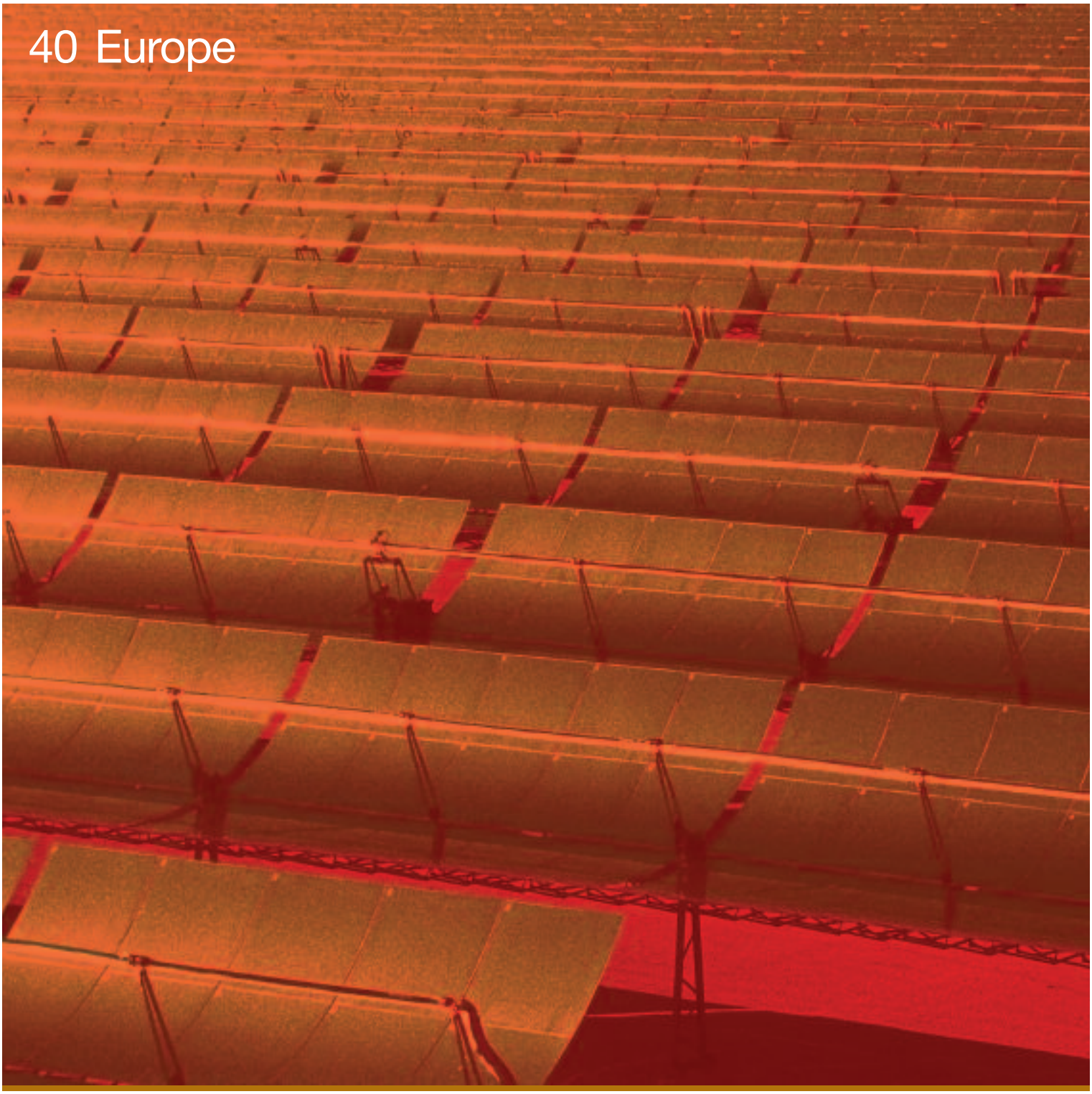

**Note:** Average response. Rate where: 5 = major driver; 1 = not a driver
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

South America Figure 6: **Which do you see as the most likely way to improve the profitability of South American utility companies?**




**Note:** Average response. Rate where: 5 = most likely; 1 = least likely
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

South American utility companies are expecting increases in prices and tariffs and they are looking at reorganising capital structure as a way to improve profitability.



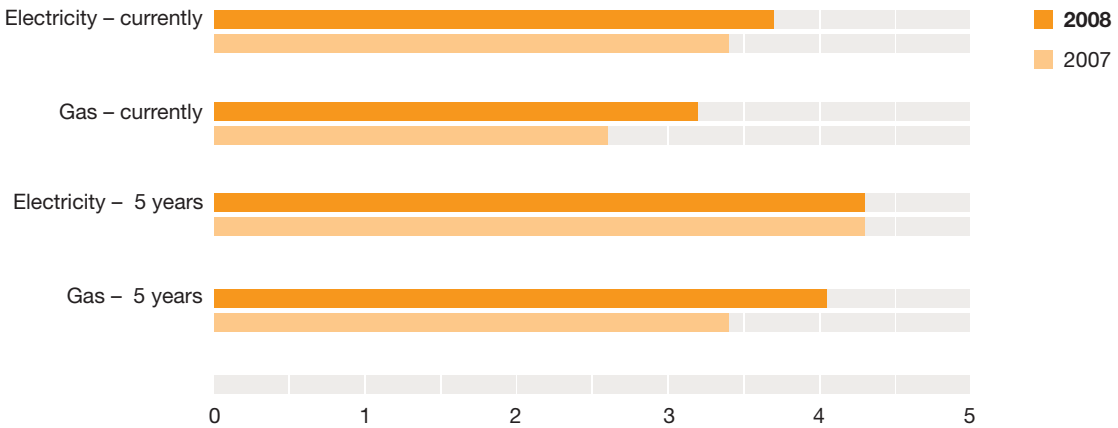
The expansion appetite among survey respondents from European utility companies has strengthened between 2007 and 2008. Interest in European markets from American utilities is also reviving.

The European power and gas utilities sectors are in the midst of a number of major developments. Liberalisation reached a landmark stage with the opening of choice of supplier to all electricity and gas customers in the EU from July 2007. The second phase of the EU Emissions Trading Scheme (ETS) commenced in 2008 and will run until 2012. Alongside these developments, the European Commission has proposed ambitious new pan-European policy measures on further market integration and climate change initiatives, with an ambitious timetable to adopt the new legislation by 2009.

## Open markets

Many countries opened their markets to customer choice ahead of the EU's July milestone. In general, electricity markets are ahead of gas markets in the road to liberalisation and figure 1 highlights that, while survey respondents recognise that much progress has been made, barriers remain and they expect the opening of gas markets to remain behind electricity. The European Commission published proposals on further gas and electricity market integration (the '3rd Internal Market package') in September 2007. The package includes proposals for transmission unbundling, cross-border network cooperation, pan-European bodies for regulators and transmission system operators respectively and measures to protect customers.

Europe Figure 1: **How open do you consider your home market to be now, and how open will it be in 5 years time?**



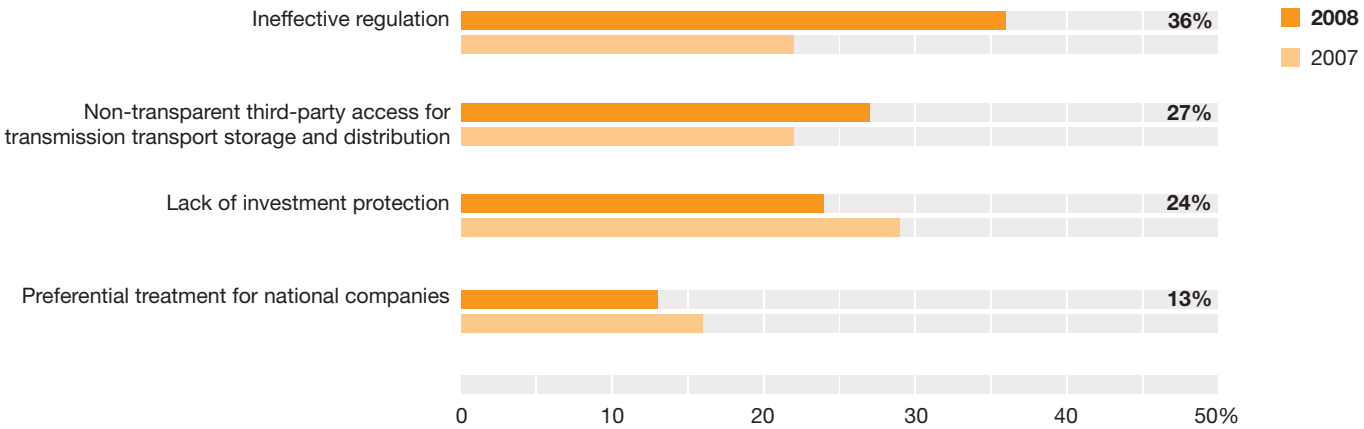

**Note:** Average response. Rate where: 5 = fully open; 1 = not open
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

The process is still ongoing, including consideration of different alternatives on how to effectively separate production and supply from infrastructure operations such as transmission network and gas storage. The utilities sector has called for more efforts on pan-European issues, such as harmonisation of regulatory framework and execution and investments across borders. Indeed, figure 2 indicates that concerns about regulation as a whole and third party access have become slightly more widespread since last year's survey.

## Expansionist moves

The European reform process is undoubtedly spurring much expansion by European power utilities. Europe has continued to see high levels of M&A activity by power utility companies with electricity sector M&A breaking all records in 2007 (see *Power Deals 2007*, PricewaterhouseCoopers). Such expansionist activity looks set to continue. The expansion appetite among survey respondents from European utility companies has strengthened between 2007 and 2008 with the UK, Germany and Central Europe heading the target markets (see figure 3). The UK has risen to the top from a much lower position last year, reflecting the country's increasing need for new generation investment including opportunities for nuclear expansion.

Europe Figure 2: **Which is the largest barrier to entry (assuming appropriate laws have been passed to permit competition)?**



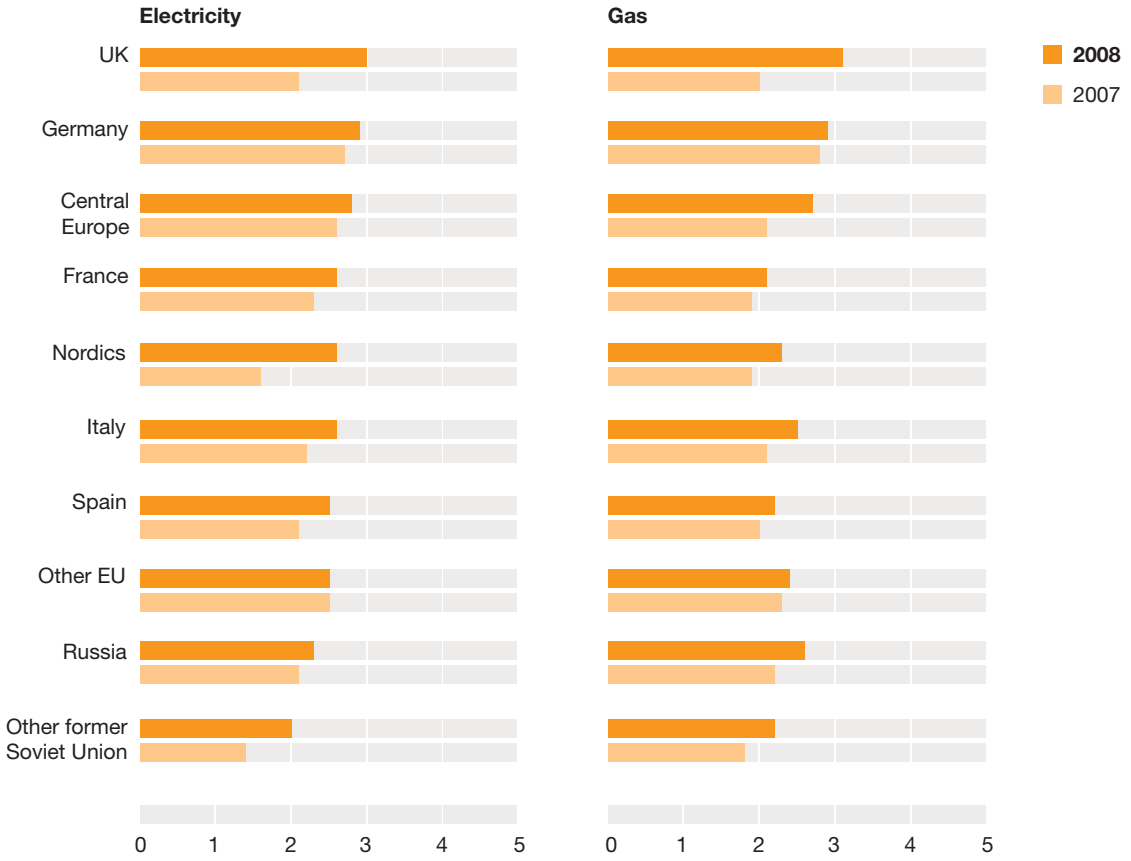

**Note:** Europe responses only. % share of responses
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

## Climate change

In January 2008, the European Commission announced new initiatives on climate change and the promotion of renewable energy (the 'green package'). This package follows up targets agreed by EU leaders in March 2007 to strive for a 20% reduction in GHGs from primary energy consumption by 2020 compared with 1990 levels and, indeed, to increase this to 30% if a new global climate change agreement can be secured in which other developed countries make comparable efforts. Other targets include 20% of all European energy to come from renewables by 2020 and a 20% saving on total EU energy consumption compared to projections to 2020. The 'green package' proposal includes details of how the effort will be shared among member states and explicit approaches to achieving the goals.

A key element is the proposal to increase the auctioning of allowances in the EU Emissions Trading Scheme after 2012 to achieve full auctioning by 2020. This will replace the predominantly free allocation in the first two ETS phases, in 2005-2007 and 2008-2012.The updated EU ETS target is to reduce greenhouse gases by 21% compared to 2005 levels by 2020. In addition, a 10% reduction compared to 2005 is expected by sectors not participating in the ETS, to be split between member states. Other elements in the package cover renewables and the development of carbon capture and storage (CCS). The long-term goal is to reach a 60-80% reduction of GHG emissions by 2050 from 1990 levels.

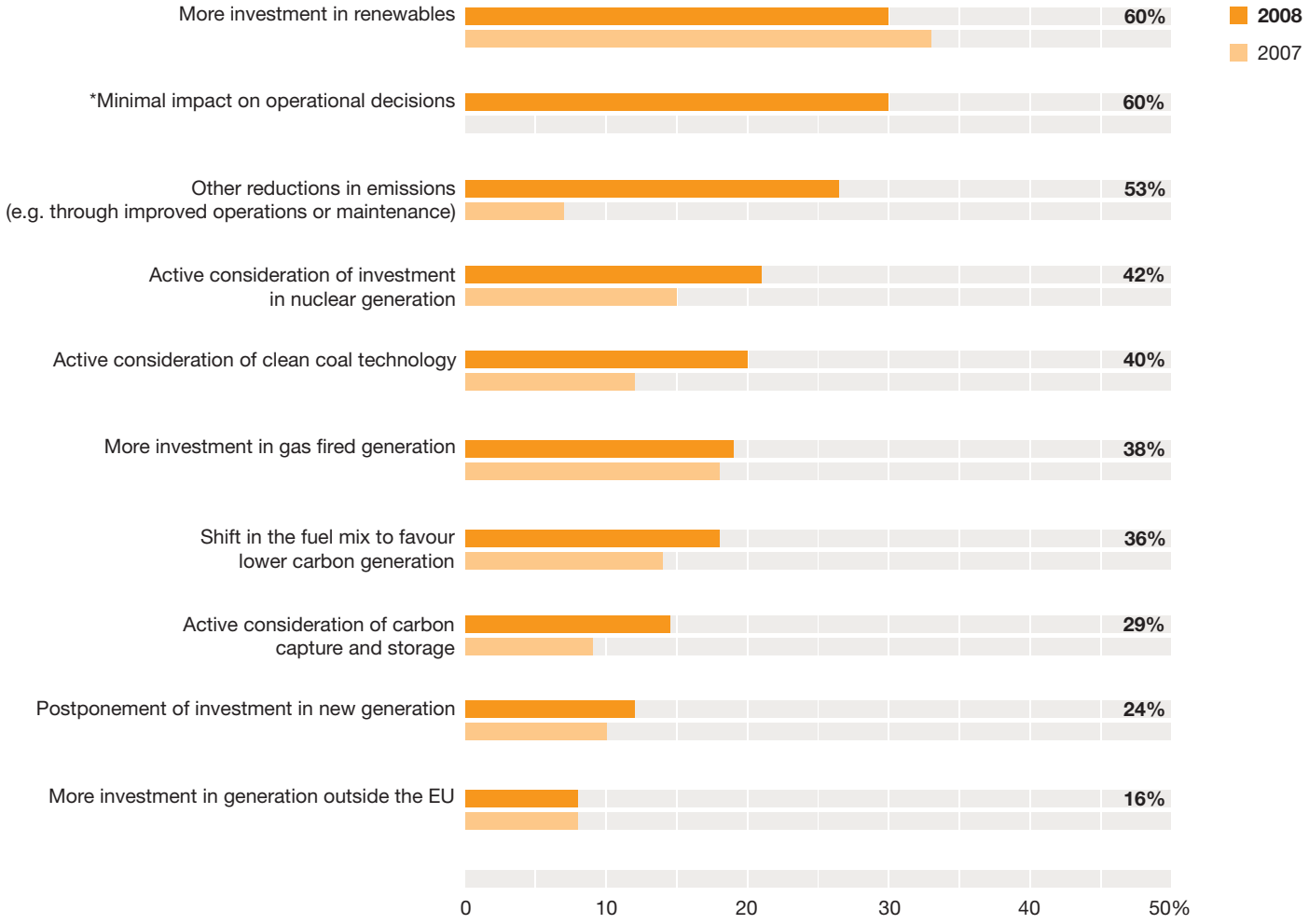
Europe Figure 3: **What geographical markets are your priorities for expansion in the next 5 years in the electricity and gas market?**




**Note:** Average response. Rate where: 5 = high priority; 1 = low priority
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

Post-2012 auctioning is likely to heighten the impact of the ETS along with a tightening of allowance allocations. After the over-allocation which limited the impact of the first phase, EU governments tightened second phase allocations. Our survey responses indicate that the ETS has had more impact on utility companies compared to last year (see figure 4). Although a majority (60%) say the scheme had a minimal impact on operational decisions, there are clear signs that the scheme is having an impact on longer-term decisions, notably investment in renewables but also performance improvement mechanisms to reduce emissions (up from 14% of respondents mentioning it to 53%), active consideration of nuclear investment (up from 30% to 42%), clean coal technology (up from 24% to 40%) and carbon capture and storage technology (up from 18% to 29%). Overall 36% of respondents in 2008 said the ETS has prompted their companies to shift the fuel mix to lower carbon generation compared to 28% in 2007.

Europe Figure 4: **What impact has the EU ETS had on your business?**

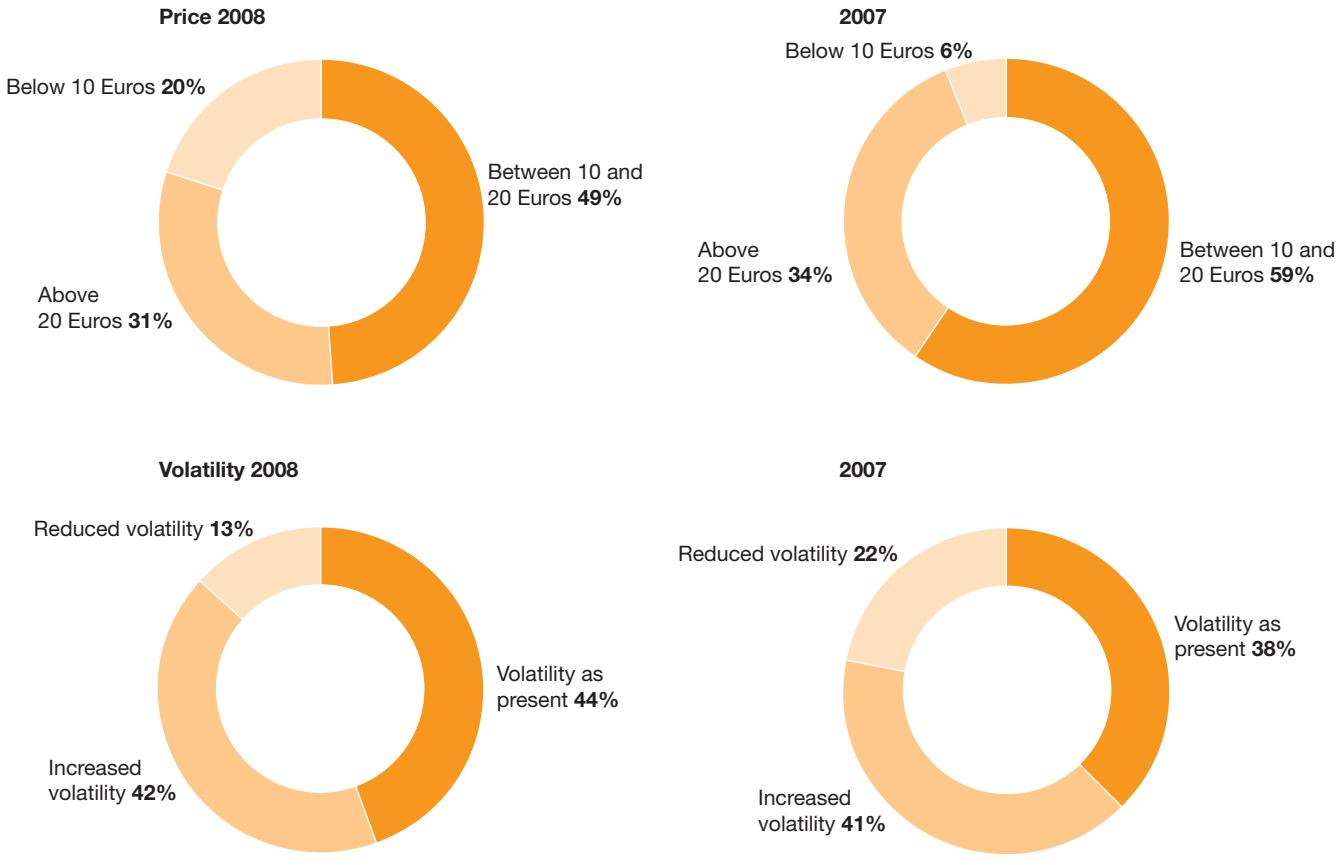



**Note:** Europe responses only. % share of responses
*Question not asked in 2007
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

## Carbon price outlook

Looking ahead at carbon prices and volatility, European respondents to our survey appear to have a slightly more bearish outlook on carbon prices as a result of the national allocation process covering the period 2008-2012 compared to their expectations in last year's survey. The European Climate Exchange price for carbon has ranged from Euro 19-23.50 in early 2008 but nearly half (49%) of survey respondents anticipate the price will trade in the lower Euro 10-20 range longer term and 20% point to a price even lower still. Against this, nearly a third (31%) support the view that the price will stay above Euro 20. This divergence of views is matched by an overall view that volatility in the carbon market is unlikely to reduce with 42% expecting increased volatility. The price of EU allowances peaked at Euro 32 in Spring 2006 but, since that time, has been largely trading in the Euro 15-25 range.

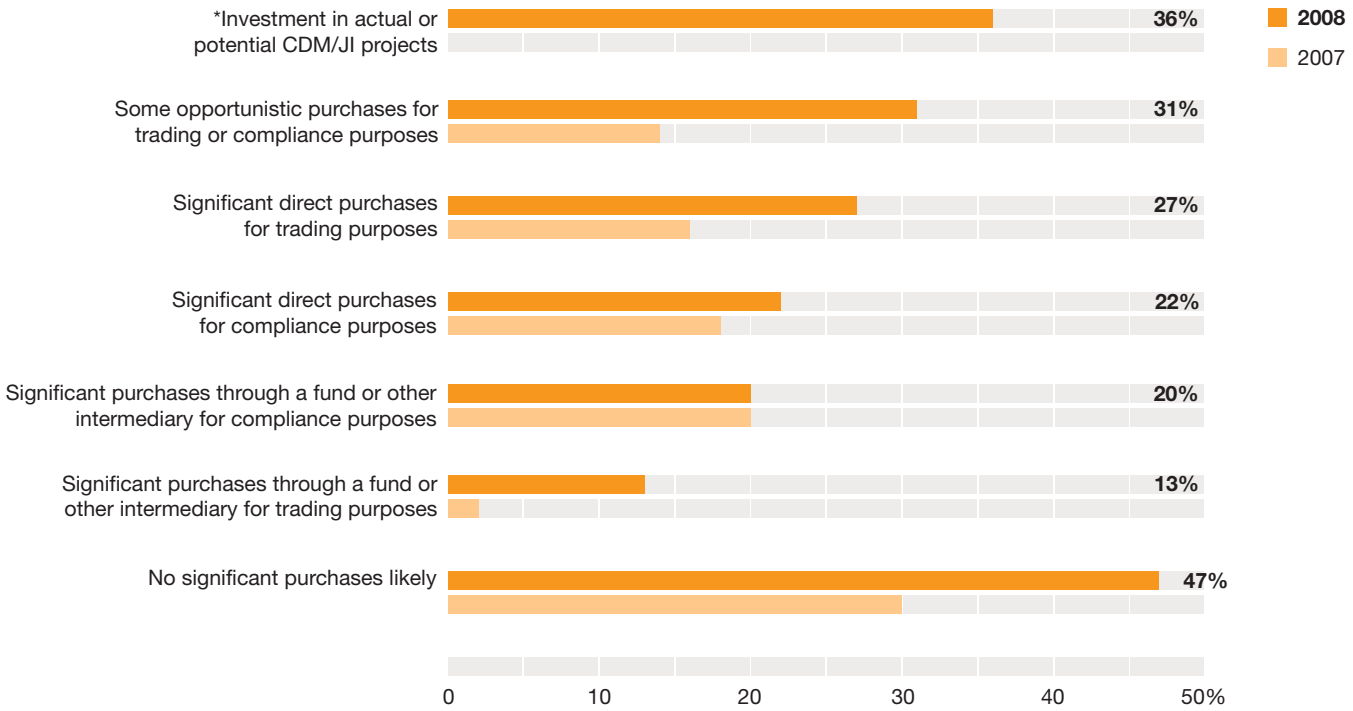
Europe Figure 5: **What impact do you expect NAP2 to have on carbon prices in the 2008-12 period?**




**Note:** Average responses only. % share of respondents
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

# The EU Emissions Trading Scheme is starting to bite with a clear impact of long-term investment decisions. Sixty per cent of survey respondents report increased investment in renewable generation as a result of ETS.

Europe Figure 6: **What is your involvement in the clean development mechanism (CDM) and joint implementation (JI) market?**




**Note:** Europe responses only. % share of responses
*Question not asked in 2007
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

Finally, as phase 2 of the EU ETS settles down, many utility companies also appear to be increasing their involvement in the CDM and JI market. Over a third (36%) of survey respondents report that their companies are investing directly in CDM/JI projects. Some of these may, as a result, have no need to top up their emissions allowances by making further CDM/JI credit purchase or trades and, indeed, 47% of respondents report that no significant purchases are likely. However, many other respondents report that their companies are making some opportunistic purchases for either trading or compliance reasons (31% of respondents, up from 14% last year), significant direct purchases for trading (27%, up from 16% last year) or significant direct purchases for compliance purposes (22% up from 18% last year).

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## From distressed coal asset to the FTSE 100

Drax is Britain's biggest power station and the biggest coal fired power station in Western Europe. It produces up to 7% of the UK's annual power demand. The 2001 introduction of market-based trading arrangements in the UK led to power prices declining by 40% over the ensuing 18-month period. A long-term power purchase agreement for around 60% of its generation meant Drax Power was largely protected from the fall. However, the contract fell away when the counterparty suffered a downgrading to its credit rating during 2002, leaving Drax largely exposed to the reduced market price. By the end of 2002, Drax was in the hands of its creditors after the owners were unable to meet their debt service obligations.

- PricewaterhouseCoopers were engaged as advisor by the agent bank managing Drax's restructuring. PwC was responsible for scoping and developing a project-finance based financial restructuring valuation model and developing financial restructuring options. This included reviewing short-term cash flow forecasts, assisting the plant in formulating its trading strategy, reviewing the credit requirements associated with trading the plant's output, reviewing the plant's coal procurement arrangements and developing the financial model to be used as the basis for the restructuring discussions. As restructuring progressed, options for enhancing the valuation of the assets were developed.

- PwC was later engaged as the reporting accountant to Drax Power in support of the company's floatation. We prepared both 'short form' and 'long form' reports, while appreciating the need to help obtain the best valuation for the business in the market by being concise and forthright about the company's strengths and being constructive and innovative in dealing with potentially difficult areas.

- As part of the proposed re-financing and listing of Drax Power, the company issued new shares and paid cash in debt which required the preparation of a report under section 103 of the 1985 Companies act. We prepared this report after considering the 'economic value' to the company of the debt, by reference to the ability of the company to service debt under business plan cash flows, re-financing and relisting document analysis, bid approaches and target gearing levels.

- Since relisting, PwC has been working on a number of areas assisting Drax to deliver its business plans, including extensive financial and operational modelling advice.

The period of our work with Drax has seen the generation asset transformed from a distressed asset to a FTSE 100 company with around a seven-fold increase in implied value.

Progress towards liberalisation remains highly variable. Sixty-three per cent of survey respondents from Asia believe their home market will liberalise within the next five years but the remainder are unable to foresee any prospect of liberalisation.

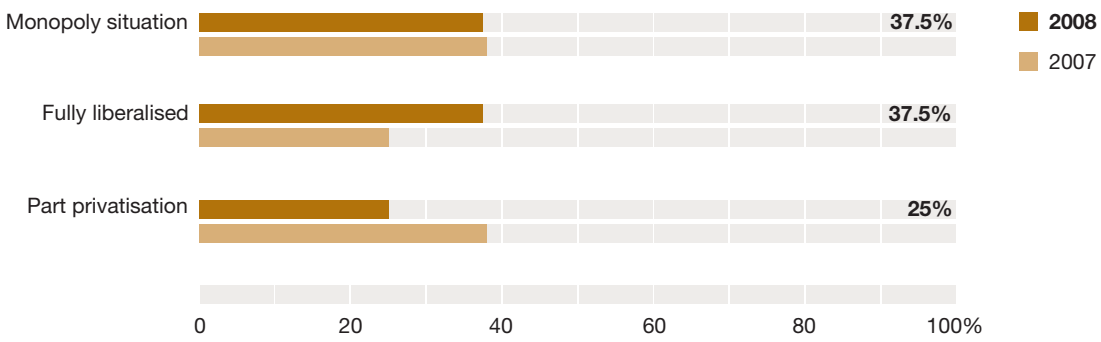
# Asia

Strong economic growth is characterising many Asian countries with consequent huge opportunities as well as challenges for power utilities. Increased demand for electricity has provided significant opportunities for power utilities to build up revenue but it has also resulted in equal, if not higher, cost pressures. In turn, these may have limited, and possibly decreased, profitability growth. Liberalisation of power markets, optimisation of cost and capital structure and regulatory management are important for the future of the sector in the region.

## Liberalisation

The pace of liberalisation for the power utilities industry varies considerably across Asia. Different countries are putting in different levels of effort and reforms in order to move the industry forward. Respondents to our survey come from a variety of market environments, split evenly between those in fully liberalised markets and those with monopoly situations with a quarter reporting their markets are in-between.

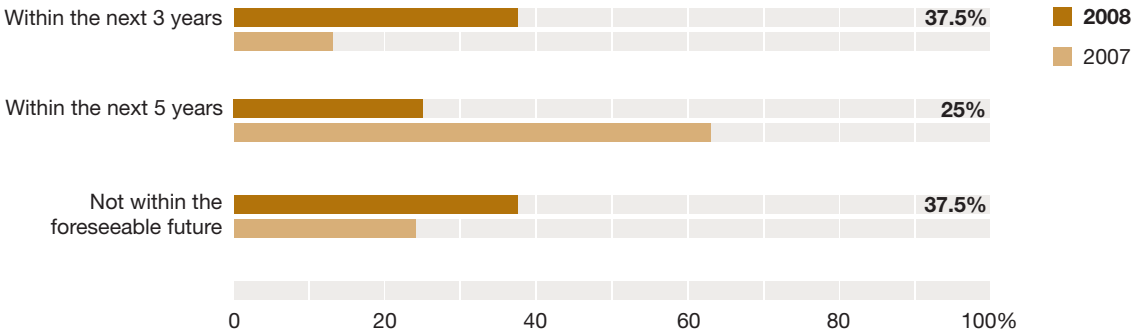
Asia Figure 1: **What is the present market structure within your country?**




**Note:** Average response. % share of responses
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

The variety of country approaches to market reform is also reflected in a very mixed outlook for future liberalisation. While 37.5% of survey respondents believe their company's home market will liberalise within the next three years and a further 25% within five years, the remainder are unable to foresee any prospect of liberalisation. Developments in China, the continent's largest market, highlight the uncertain pace of reform. The reform of China's tariff setting reforms in recent years and the plan for privatisation of transmission sector are on-going. These are moving the industry towards a more liberalised market. However, the pace of industry reform is still slow and and it is not clear as to when the reform will be substantially completed.

Asia Figure 2: **Within what time period do you believe your market will liberalise?**

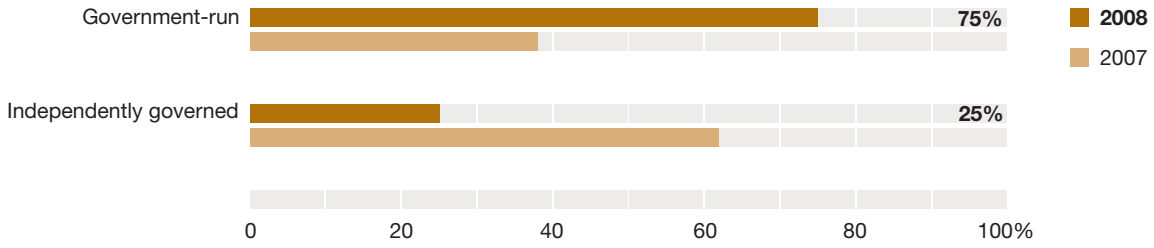



**Note:** Average response. % share of responses
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

## Regulatory outlook

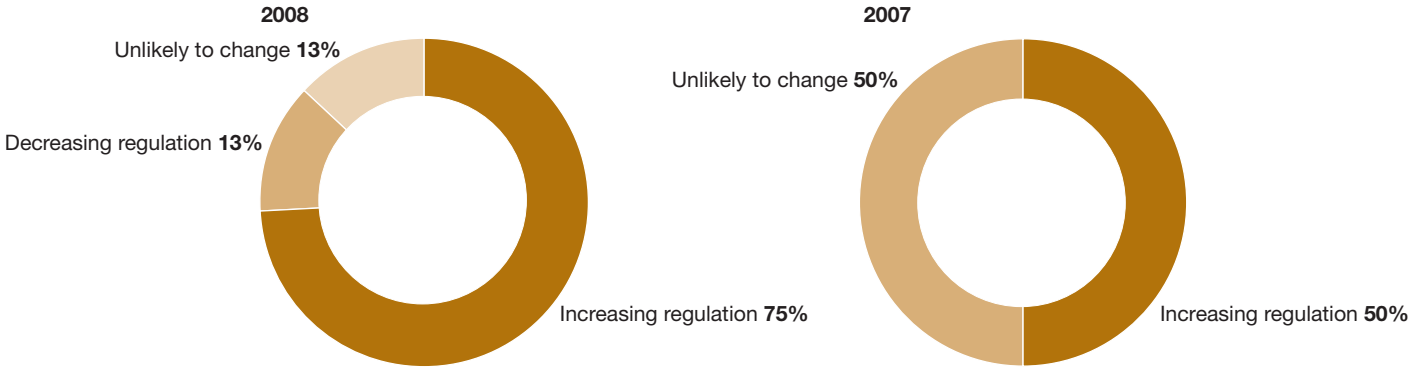
Three-quarters of respondents report that regulation in their country is government-run as opposed to being in the hands of an independent body (see figure 3). In recent years, governments in the region have been increasingly involved in the power sector, particularly in the area of pricing and environmental requirements. In China, for example, there have been a series of policies and regulations on power utilities, covering matters such as project approval, pricing, environmental protection and customers. In the pricing arena, tariff reform moves in the region are seeking to make prices more market-based. Such initiatives include pilot-testing in China of a tariff bidding mechanism. On the environmental front, policies are being tightened. Again exact measures vary from country to country. Taking China as an example, power utilities are required to install desulphurization facilities in return for corresponding tariff incentives. Levy rates and other penalties on certain categories of emissions have been raised. China has also introduced policies to encourage the closing down of small plants and the development of larger power plants.

Asia Figure 3: **Is the regulation within your country government-run or independent?**



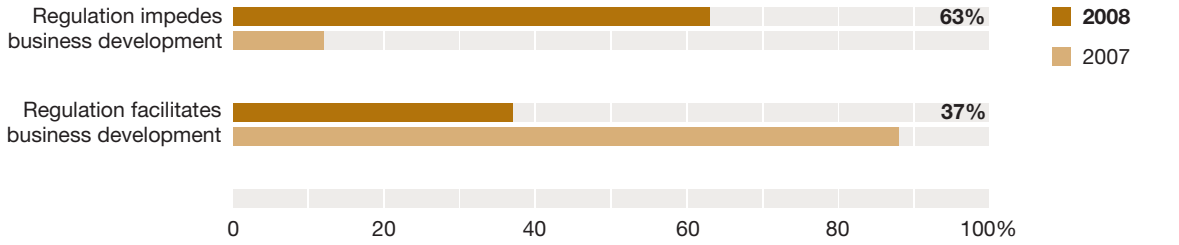

**Note:** Average response. % share of responses
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

Asia Figure 4: **Do you anticipate there will be an increase or decrease in regulation over the next three years?**



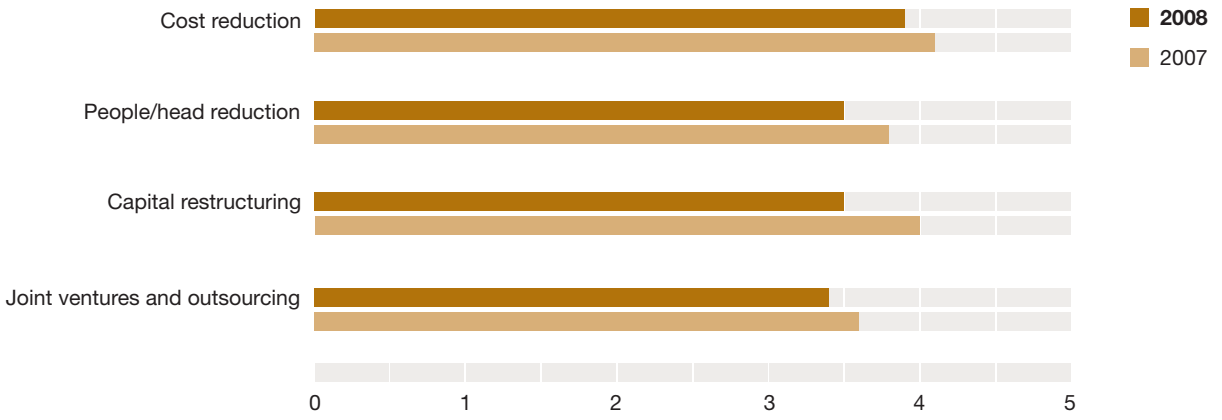

**Note:** Average responses only. % share of respondents
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

Asia Figure 5: **Is the nature of regulation a facilitator of business development or impediment?**




**Note:** Average response. % share of responses
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

Asia Figure 6: **What is driving your company's performance improvement?**




**Note:** Average response. Rate where: 5 = strong driver; 1 = weak driver
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

Three-quarters of our survey respondents expect regulation in the region to continue to increase. This is in contrast with last year when respondents were split 50:50 on whether regulation would increase or remain at the same level (figure 4). However, a possibly more significant contrast with last year is the proportion of respondents feeling that regulation is impeding business development. Whereas last year 88% of respondents believed regulation had a role that actually facilitated business development, by 2008 sentiment has turned and a majority (63%) see it as getting in the way of business (figure 5). Expectations of potential expenditure increases as a result of more stringent regulation could form part of the reason behind this change in outlook.

## Performance improvement

In the Asia region, cost reduction continues to be the lead focus for utility companies to improve their performance. The importance of cost reduction is made even greater by significant increases in fuel costs as a result of scarce resources. Even in the case of China, where most of the power plants are coal-fired and the tariff is linked to the increase in coal price, not all of such increases can pass through to the end-user via tariff adjustments. Thus, power utility companies have to take appropriate cost reduction measures in order to maintain their profitability. Other routes to performance improvement are also being actively pursued by Asian utility companies including headcount reduction, especially as technological innovation permits greater automation, the development of more efficient capital structures to enhance shareholder returns, joint ventures and outsourcing.

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### Advising on investment opportunities in China

Over the last decade, China's power industry has been undergoing substantial change. Strong economic growth has led to increased demand for electricity with consequent concerns for energy supply, fuel supply and environmental protection, among others. The Chinese Government has initiated various power industry reforms to cope with society's growing demand for electricity.

An acceleration in the construction of new generation has been accompanied by measures to increase the efficiency of generation and transmission. With the adoption of advanced technology in transmission and distribution of electricity, China plans to bring the line loss of its power grid down to 7% by 2010.

The increase in generation, however, has brought with it issues of fuel supply. China is heavily reliant on coal-fired generation as its main source of generation – coal accounted for 78% of generation in 2007. To address the coal supply and rising coal costs issues, new coal-fired power plants are being located closer to the coal mine, where possible, to reduce transportation costs.

To reduce reliance on coal, plants that use other energy sources such as hydro, nuclear and wind are being built. This strategy is in line with the new renewable energy law recently promulgated by the Chinese Government. China plans to increase its nuclear power capacity to 10,000MW by 2010 and 40,000MW by 2020, and renewable power capacity to 5,000MW by 2010, and 30,000MW by 2020. Currently, the government is providing tax benefits to encourage the adoption of renewable energy.

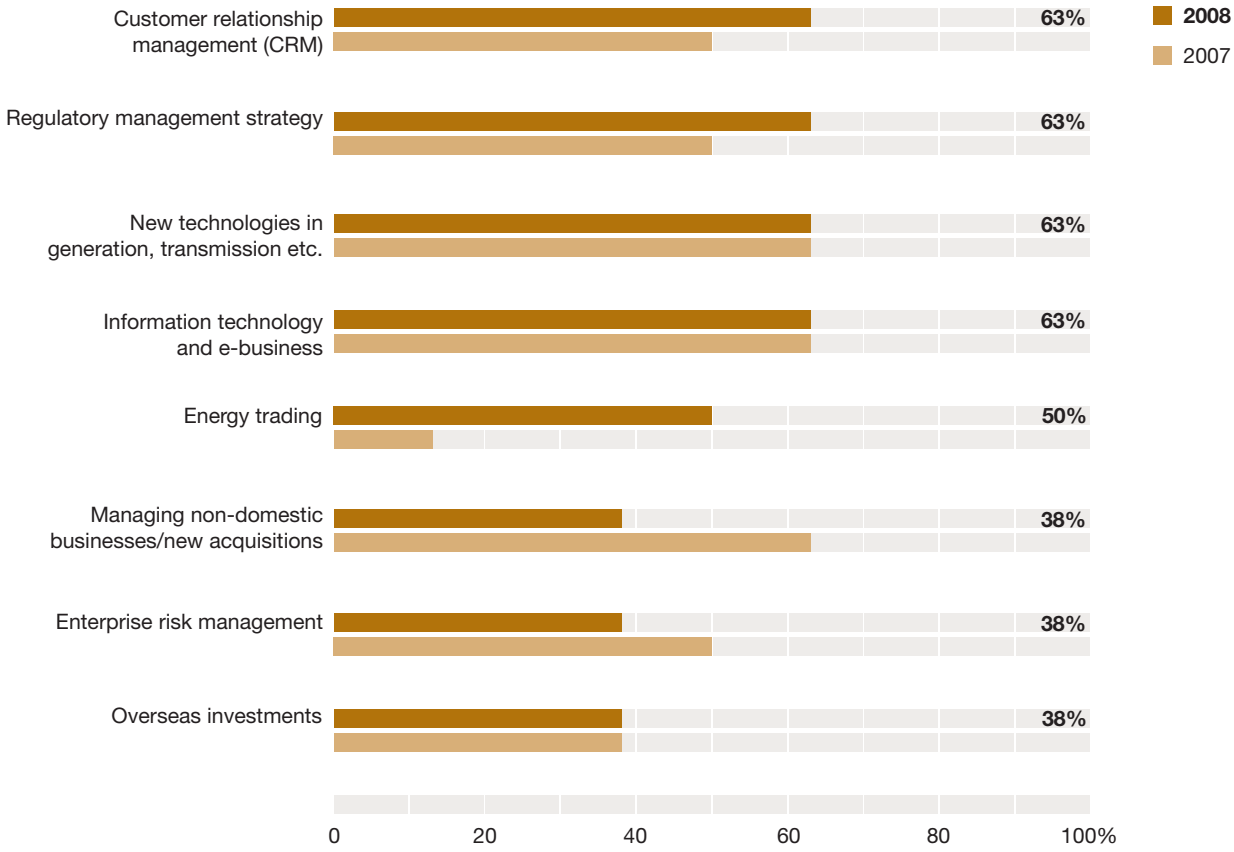
Although China has been actively addressing power industry challenges, these challenges are expected to continue and multiply. With continuing strong growth in China's economy, they, in turn, present a range of new opportunities for domestic and foreign investors in the power industry sector.

PricewaterhouseCoopers advises power utilities in China as well as domestic and foreign investors. Our services cover the issues discussed above as well as specific needs including, for example, due diligence services and post deal integration advisory services for M&A activity.

## Investments and future challenges

Investments in regulatory management strategy, customer relationship management and energy trading are becoming more widespread among respondents to our survey. In addition, companies are continuing to focus investment on information technology and new generation, transmission and distribution technologies. The focus of investment has shifted away somewhat from non-domestic business and acquisitions towards internal investment (see figure 7). Such investment is important as companies modernise and strive for greater efficiency.

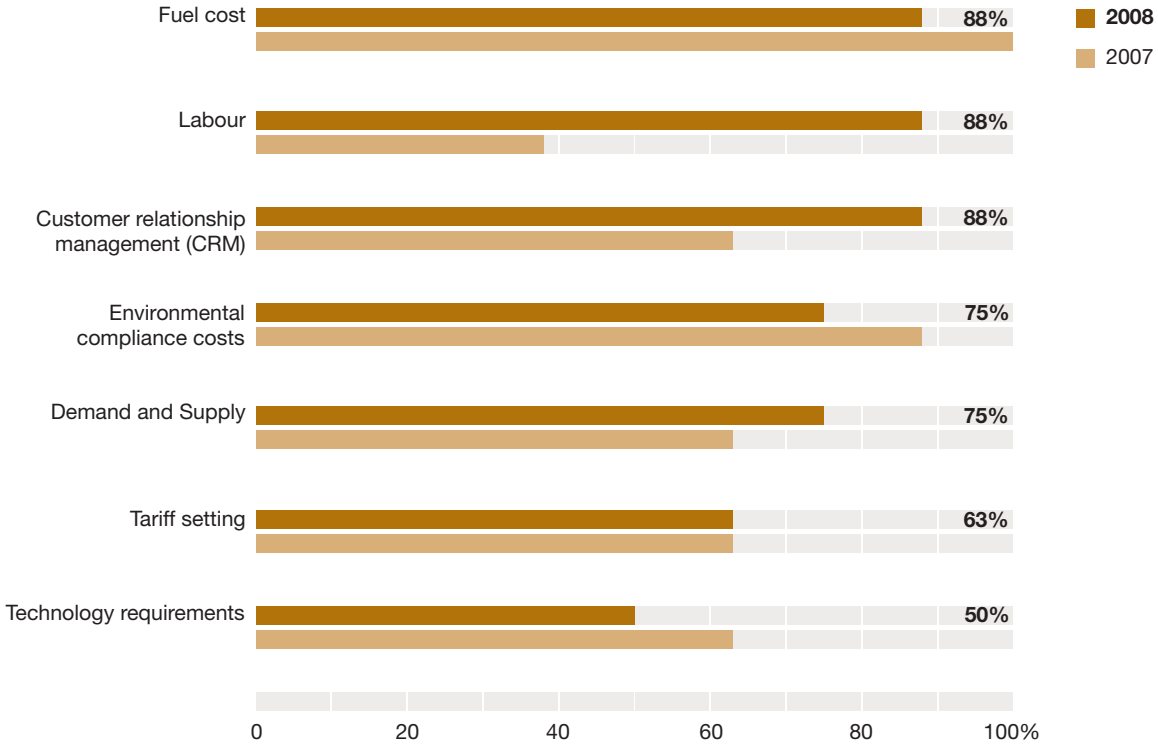
Asia Figure 7: **In which areas of your business have you invested recently?**




**Note:** Average response. % share of responses
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

Companies face a range of major challenges but, with growing competition and demands on cost structures, customer relationship management (CRM) has risen to be one of the three challenges that top the list for companies in the next year or two (see figure 8). The other two are fuel costs and labour. Fuel costs have continued to rise in the region and the trend of improving staff benefits and protection in Asian countries as a result of the economic growth is causing new challenges. Like CRM, many more respondents identify labour as a major challenge in this year's survey than in last year's. Underpinning the three challenges of fuel cost, labour and CRM, balancing supply and demand remains a key issue for utility companies as does the challenge of absorbing increased fuel costs without any corresponding cost recovery tariff.

Asia Figure 8: **What is/are the major challenge(s) to your business within the next 12 to 24 months?**




**Note:** Average response. % share of responses
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

# Australia and New Zealand

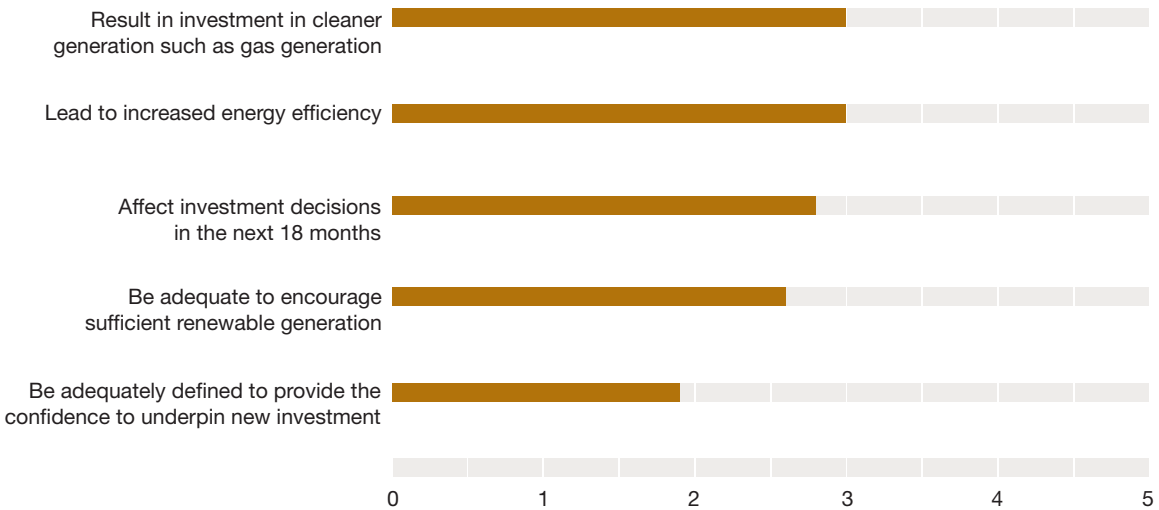
The environmental context for power utility companies in Australia has changed significantly. Incoming Prime Minister Kevin Rudd's first official act, on his first day in office on 3 December 2007, was to sign the instrument of ratification of the Kyoto Protocol. The new government is committed to cutting GHG emissions by 60% by 2050 but has yet to confirm its 2020 target. The government is also proposing to introduce a national emissions trading scheme in 2010. The uncertainty surrounding free allocation of emission permits under the proposed national emissions trading scheme is a critical issue for the Australian power generation industry. Resolution of this matter will have a major influence on future energy supply certainty and investment from the private sector.

## Key climate change initiatives

Although an Australian emissions trading scheme has been announced as the main policy mechanism for reducing carbon emissions, uncertainty remains around the design, particularly around emissions caps and compensation levels for affected sectors. There is also much uncertainty around how existing, largely state-based environmental schemes will operate under the new national framework and what this will mean for existing asset values.

The Australian Government is awaiting the recommendations of the Garnaut review (a review commissioned to examine the impacts of climate change on the economy, and recommend medium to long-term policies to improve the prospects for sustainable prosperity) to nominate the optimum emissions trajectory and other design features such as how emission permits will be allocated.

Australia Figure 1: **What do you think that the expected national emissions trading scheme will result in?**




**Note:** Average response. Rate where: 5 = agree; 1 = do not agree
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

In an interim report published in February 2008 Garnaut suggested a low initial carbon price was not in Australia's best interests. This would imply a change in the relative cost effectiveness of coal, gas and renewable generation with the cost of carbon hitherto not being internalised. This potential step change in the economic viability of carbon-producing fuels is driving business to investigate lowest cost abatement opportunities (for example, at existing fossil fuel generators) and to plan for investments in cleaner forms of technology. The Federal Government is also considering supplementary policy tools aimed at addressing the causes of emissions that cannot easily be controlled through a mandated trading scheme, such as increasing energy efficiency at a domestic level. The state of Victoria has already announced an obligation on electricity retailers to increase domestic energy efficiency from 2009. A draft bill for a similar Australia-wide policy is currently under review. Our survey respondents clearly believe an emissions trading scheme can play a part in promoting cleaner generation and energy efficiency but senior utility executives were less convinced that the scheme would be sufficient to encourage new investment. The price of carbon under such a scheme will be all-important.

Gas-fired generation has the potential to deliver emissions intensities below half that of some existing coal generators and is seen as the most economical first response towards a lower carbon future. Ninety-two per cent of our survey respondents believe that gas-fuelled generation will increase over the next 10 years. The issue in Australia has been access to gas, particularly in Queensland and New South Wales (NSW) which are removed from the traditional Australian offshore gas reserves of Victoria, South Australia and Western Australia. In 2007, Origin Energy announced plans to build Australia's largest ever combined cycle gas project (at about 600MW). This project follows exploration efforts of mostly untapped coal seam gas prospects located close to the energy demand centre of South East Queensland. In 2007, the NSW Government commissioned Professor Tony Owen of Curtain University to examine the requirements for new baseload generation and also how NSW could address the need to reduce its emissions intensity. This review concluded that adequate domestic gas is likely to be available until at least 2020 and possibly well beyond and that there is adequate lead time for new pipeline projects to be completed.

Survey respondents were less convinced that an emissions trading scheme would be sufficient to encourage new investment.

In April 2007, the Council of Australian Government (COAG) endorsed a two-phase approach for a nationally mandated roll-out of electricity smart meters to economically viable areas. The roll-out of advanced interval (smart) meters is regarded as a key mechanism for providing price incentives for consumers to respond to the challenge of climate change. Advanced interval meters were highly rated by survey respondents as a useful mechanism for developing new product offerings and creating incentives to change consumption patterns.

The New Zealand Government has recently introduced an Emissions Trading Scheme as its core price-based measure for mitigating climate change. The stationary energy sector (including coal, gas and geothermal) will commence their obligations to the scheme on 1 January 2010 in respect of their carbon emissions. Significantly, the New Zealand Government is proposing that there will be no free allocation of emission units to electricity generation participants. The Emissions Trading Scheme, coupled with its sister regulatory policy of a thermal generation moratorium, will ensure that investment in electricity generation will increase New Zealand's already high percentage of renewable electricity. As a result of the New Zealand Government's renewable preference, new gas-fired generation is unlikely to increase in the next 10 years.

## Other industry challenges

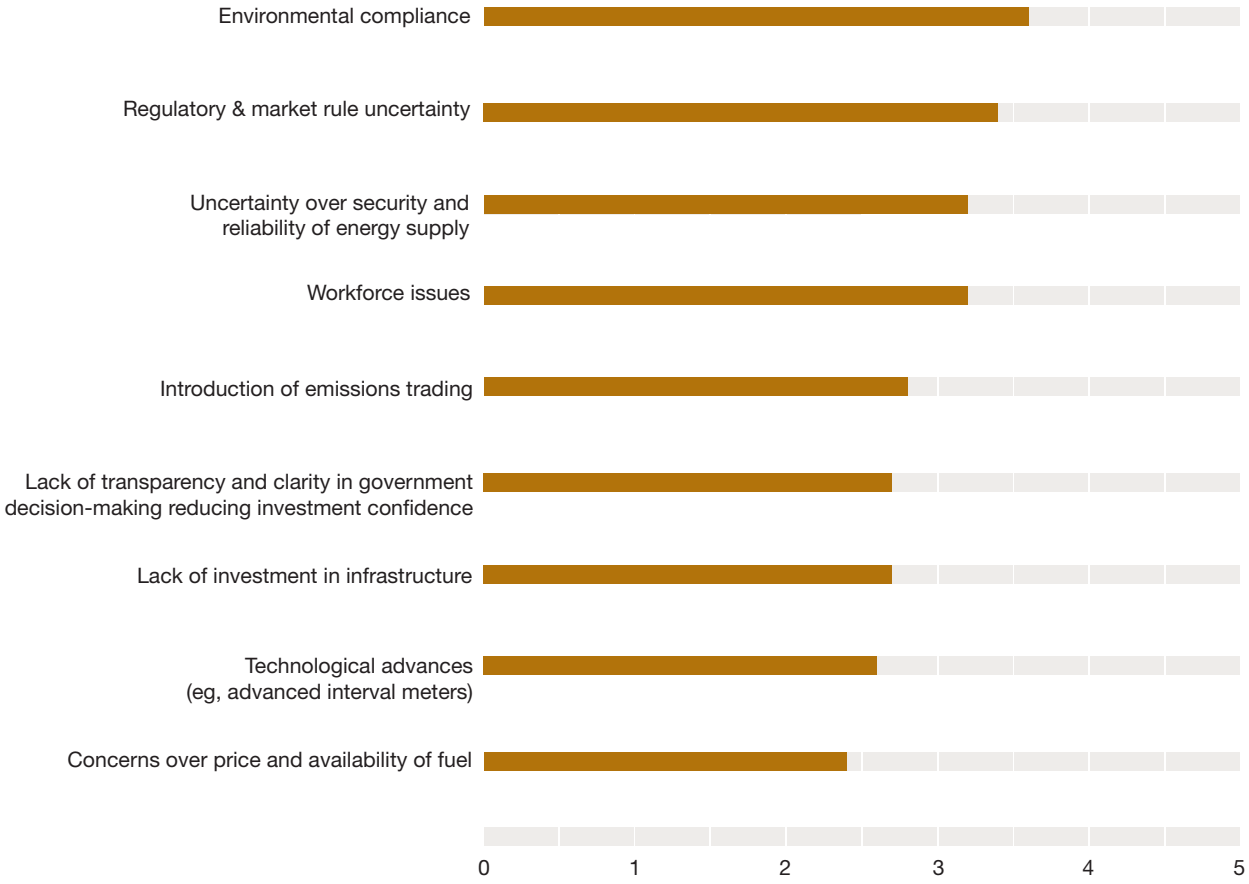
Survey respondents highlight environmental compliance as the number one challenge facing their business in the period ahead (see figure 2). Regulatory uncertainty, workforce skill shortages and the new emissions trading scheme are also high priority areas for the industry. Despite these concerns, State and Federal Governments have made significant progress to integrate utility markets (electricity, gas, and water) during 2007. COAG has endorsed a number of major reform initiatives to achieve closer integration:

1) Consolidation of existing national electricity market operator and state based gas market operators into a single entity, Australian Energy Market Operator (or AEMO) by July 2009;
2) Establishing a national transmission planning function with the AEMO;
3) Transferring responsibility of electricity and gas distribution network regulation from the states to the Australian Energy Regulator (AER). The timetable for this occurring has been delayed until September 2009, and;
4) Creating a National Gas Law that will establish a Gas Bulletin Board (GBB), and potentially a Short-Term Trading Market (STTM) for gas.

Environmental compliance is seen as the number one challenge facing utility businesses in the period ahead.

In New Zealand similar issues exist in respect of regulatory uncertainty, skill shortages and environmental compliance. As well as the introduction of a national emissions scheme, a major review of the regulatory provisions for natural monopolies contained in the Commerce Act is underway. The resulting regulatory uncertainty for energy sector participants is expected to continue for some time.

Australia Figure 2: **What are the major challenges to your business within the next 12-24 months?**



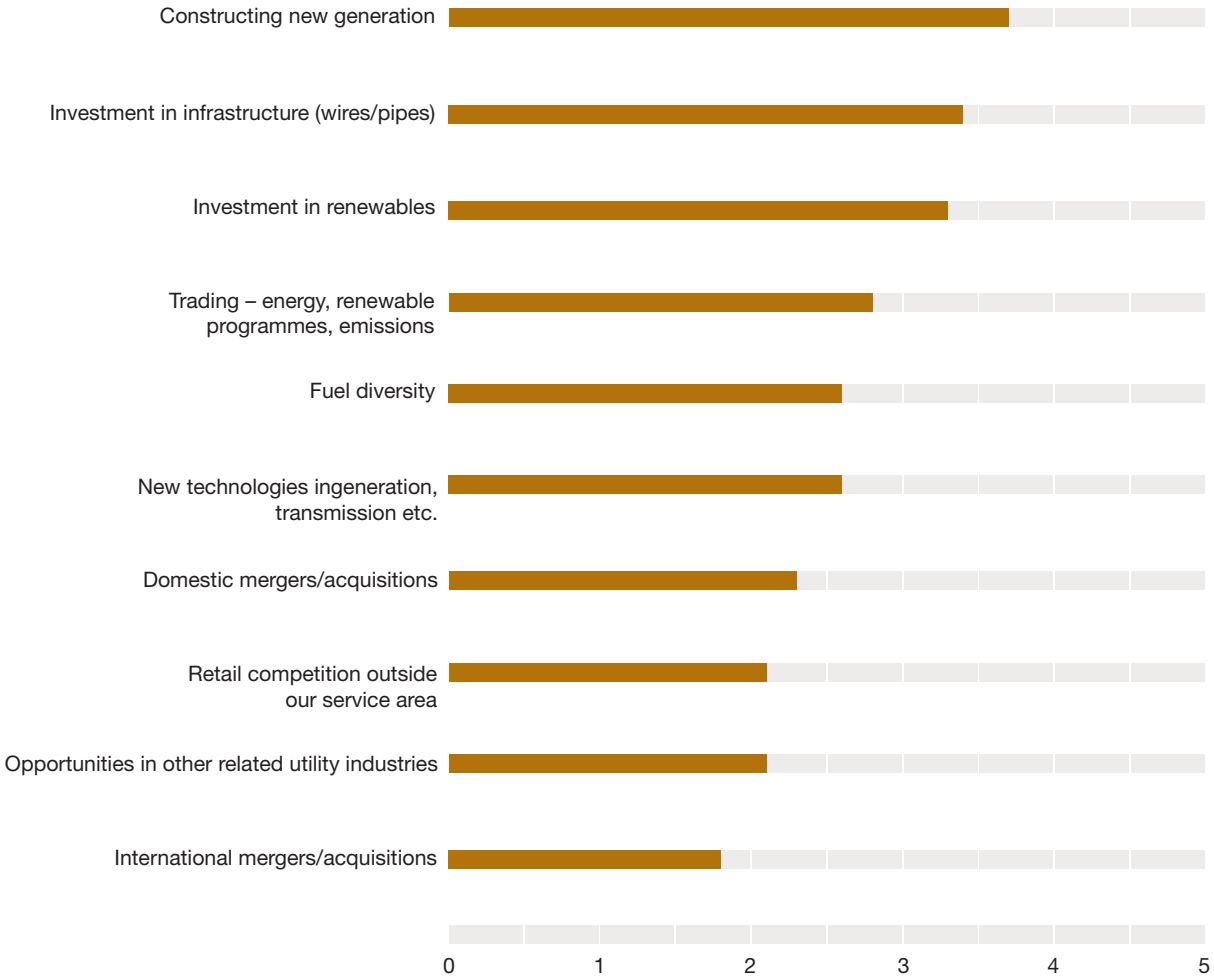

**Note:** Average response. Rate where: 5 = major challenge; 1 = minor challenge
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

## Opportunities for growth

The industry in Australia is moving from a period of change through extensive M&A activity to one of consolidation with a focus on core business activities. Organisations have been re-aligning their businesses to focus on either the regulated or deregulated segments. In the deregulated markets there is constant demand to develop new generation capacity. The key priority for the industry is investment. The survey results highlight that there is growing interest in development of renewables and gas peaking generation, particularly given the increases in state-based renewable energy targets. There is now a focus by industry on new energy development projects (gas and wind) and capital works programmes (regulated networks) due to historical underinvestment, ageing infrastructure and demand for new generation capacity.

Like Australia there is continuing demand in New Zealand to develop new generation capacity to meet supply. There is an increasing focus on developing renewable generation, particularly as the government's most recent Energy Strategy includes a target for 90% of energy to be produced by renewable energy and places a moratorium on fossil fuel generation, unless required for security of supply. Significant investment is required in core infrastructure, including the national grid and local distribution, driven by age-based renewals as well as capacity constraints.

Australia Figure 3: **How important are the following strategic growth opportunities for your company over the next 12-18 months?**




**Note:** Average response. Rate where: 5 = very important; 1 = not important
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

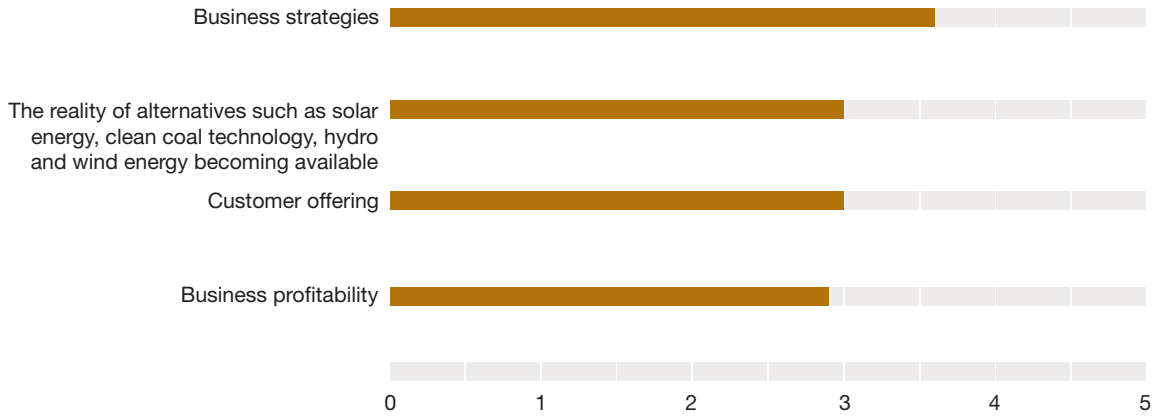
## Increased focus on sustainability

A number of high-profile events have raised the profile of sustainability in both Australia and New Zealand over the past 18 months:

- Australia's worst drought in 100 years (largely attributed to climate change) and volatile weather conditions in New Zealand;
- The UK Stern Review which concluded that the costs of not reducing greenhouse gas emissions intensity will vastly outweigh the costs of implementing change;
- The latest six-yearly UN International Panel on Climate Change (IPCC) report which cited the risks posed by climate change were largely man-made; and
- The 2007 federal election where Australia's response to climate change was a key differentiator between the two major parties.

The increased profile of sustainability and the imminent emissions trading scheme will present new challenges for utility businesses, in particular how to respond to consumer and investor behaviour driven by increased environmental awareness and how to comply with new environmental regulation. Our survey respondents expect that sustainability will have an important impact on their business strategies.

Australia Figure 4: **What impact will sustainability have on your company?**



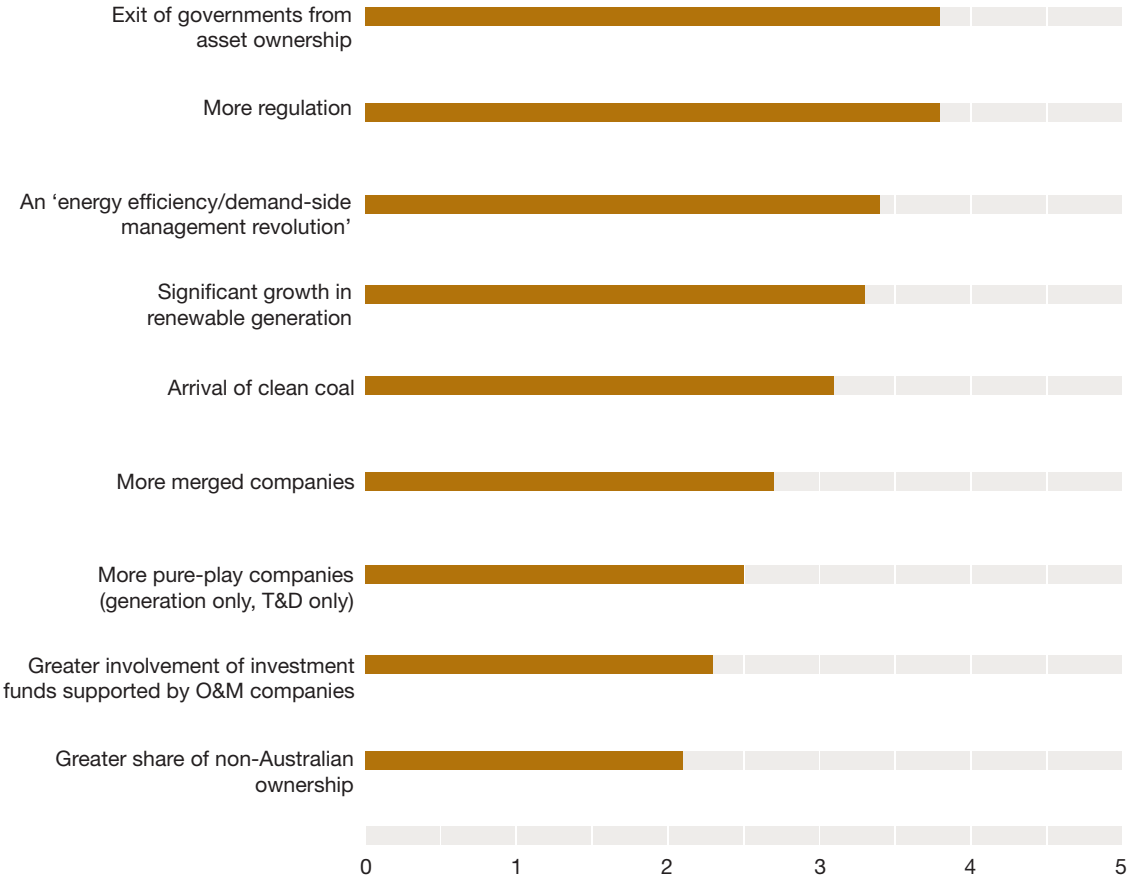

**Note:** Average response. Rate where: 5 = most impact; 1 = least impact
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

## A period of change

Looking further ahead, survey respondents believe government intervention and uncertainty surrounding environmental regulation (as noted in the Comprehensive Reliability Review of the Australian Energy Market Commission, December 2007) will have the greatest impact on large investment decisions in the future. Government involvement in the energy sector will probably recede in the short-term. In 2007, the Queensland Government earned nearly A$3 billion in revenue through the privatisation of its major energy retailers. Later that year, the NSW Government-commissioned Owen report concluded that NSW is likely to require new baseload capacity by 2013-14, and recommended that the government divest its ownership of both retail and generation assets to increase the likelihood of private sector investment. The NSW Government has since announced plans to sell off its three largest energy retailers and offer long-term leasing opportunities of its generation assets.

However, the recent worldwide credit crunch together with uncertainty over carbon liabilities (with most generation in NSW being fuelled from black coal) is likely to impact the value of these assets. Privatising the power assets of Australia's most populous state will significantly influence the future mix of ownership among Australian utility players. The exit of governments from the electricity sector in New Zealand is unlikely in the short to medium term. In the electricity distribution sector, current regulatory uncertainty will continue until such time as the review of the provisions for natural monopolies contained in the Commerce Act is completed.

Australia Figure 5: **What will be the biggest changes in the Australian utility industry over the next five years?**




**Note:** Average response. Rate where: 5 = major change; 1 = minor change
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

The near future is also expected to bring other significant regulatory changes – specifically to support Australia's commitments under the Kyoto protocol, and to foster increased transparency and efficiency within Australia's nascent gas markets. The Federal Government has provided regulatory guidance, and articulated a desire to reduce the red tape. Despite this, uncertainty still exists about how the transition from existing state based schemes will work with concerns that the regulatory burden will increase.

These concerns exist, in part, due to fears that state governments will attempt to retain some control over energy markets even after divesting their interests in energy businesses.

Privatising the power assets of Australia's most populous state will significantly influence the future mix of ownership among Australian utility players.

In 2007, the previous Federal Government commissioned a study into the potential for nuclear power generation in Australia. The study concluded that Australia could have 25 nuclear plants by 2050. However, prior to the 2007 election the Labour Government, then in opposition, campaigned under a 'no-nuclear' platform and has a policy of not supporting nuclear generation development within Australia. This effectively rules out any consideration of nuclear power for Australia within the next five years. As a result, only 25% of survey respondents believe that Australia will initiate planning for new nuclear facilities within the next 10 years. The New Zealand Government has a policy of not supporting nuclear generation development. While nuclear generation is starting to attract some attention in light of the government's proposed thermal generation moratorium, the lead-in times for a nuclear build rule out nuclear as a means of reducing New Zealand's emissions over the short to medium term.

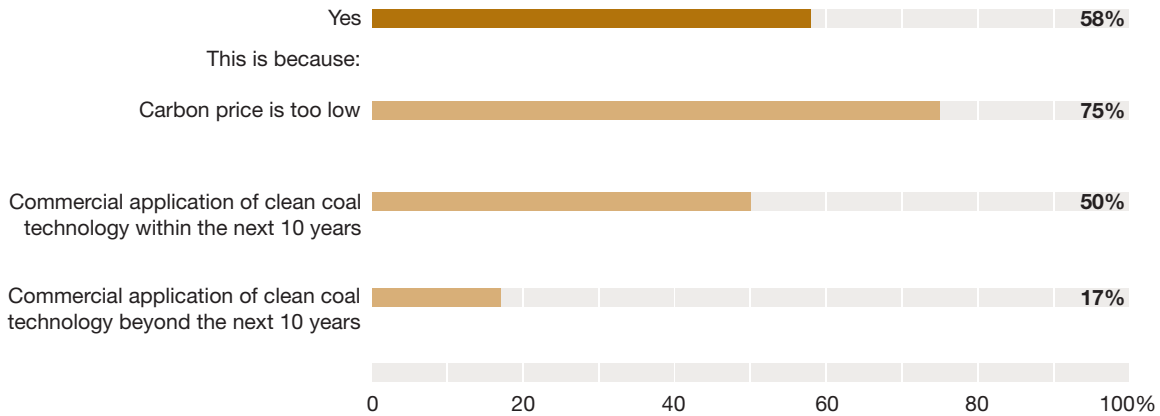
## Clean coal outlook

There is still a great deal of uncertainty regarding the near term prospects of clean coal technologies, despite significant international support. Australia has allocated A$500 million to a Low Emissions Technology Development Fund (LETDF). The fund has been designed to support the development of commercial-scale emissions reduction technologies, including clean coal technologies. A handful of demonstration projects have been earmarked in Australia, the largest being a 400MW integrated drying gasification combined-cycle (IDGCC) power generation plant designed to operate on brown coal from Victoria's La Trobe Valley.

However, clean coal technology development has not been without setbacks. In early 2008 the Bush Administration ended its commitment to the US$1.8bn (A$2 billion) FutureGen project, citing massive budget blow-outs. The US-led project was embraced by the previous Australian Government which pledged A$15 million as part of its 2007 election platform. The scheme also received support from large Australian-based coal producers including Rio Tinto, BHP Billiton and Xstrata, which contributed more than A$50 million to the project. The Owen Inquiry into new baseload capacity concluded that carbon capture and storage (CCS) is unlikely to be developed at utility scale for incorporation in baseload plants until beyond 2020. Our survey respondents were split on whether the technology would be ready within 10 years. The main barrier, mentioned by three-quarters of respondents, was felt to be the lack of financial incentive caused by the carbon price being too low (see figure 6).

A number of New Zealand businesses, both producers and users of coal, are investigating clean coal technologies. The Ministry of Economic Development, however, has stated that CCS development in New Zealand will largely be making use of 'off the shelf' technology developed overseas. Large-scale deployment in New Zealand is, therefore, likely to follow international advances.

Australia Figure 6: **In the Australian context, do you agree with global scepticism about the reality of clean coal technology being available in the near future?**




**Note:** Average response. Rate where: 5 = strongly agree; 1 = don't agree
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

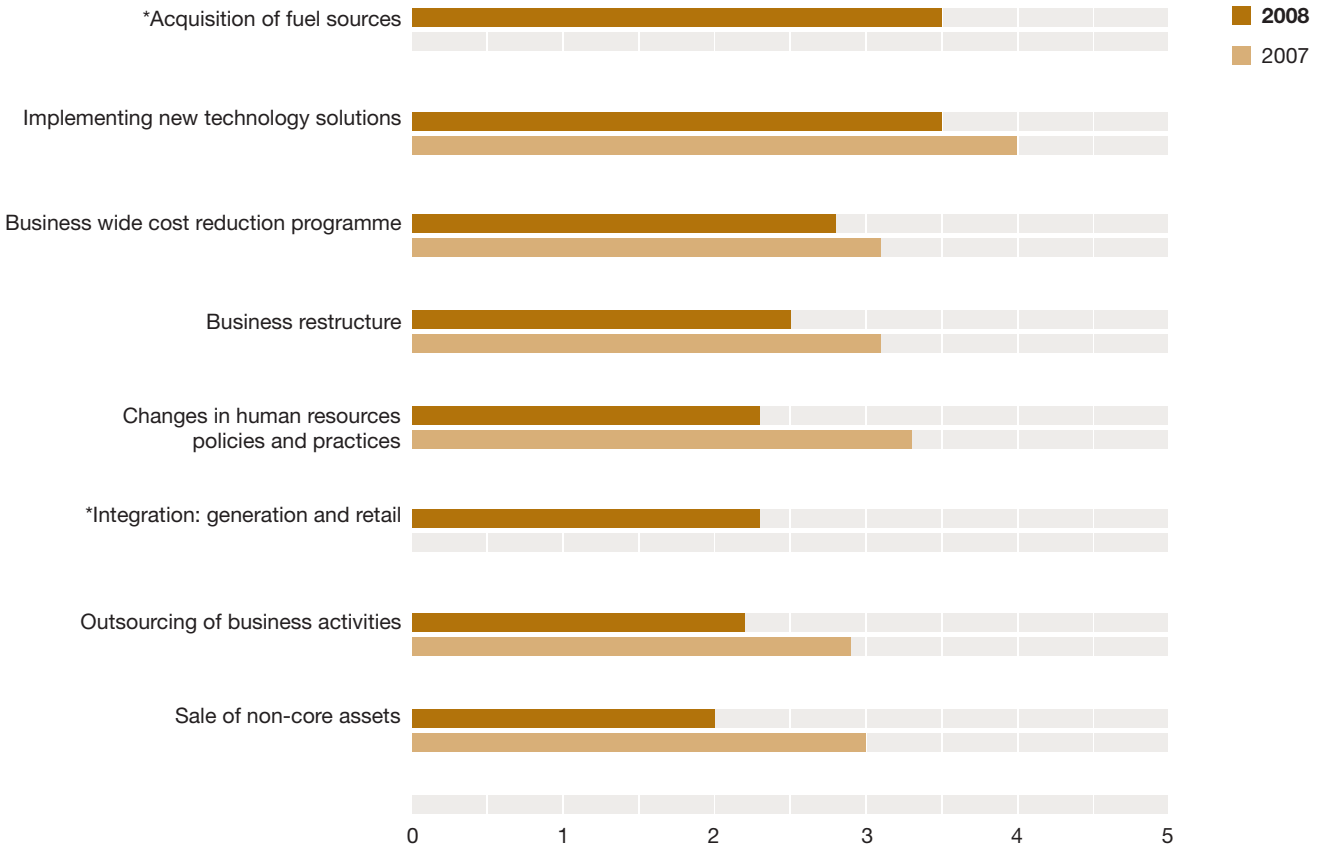
## Business performance improvement

The current state of financial markets and the need to deliver results in a volatile and increasingly competitive market are adding to the industry focus on cost reduction and operational improvements. Technological solutions are an enabler to delivering business processes more efficiently and effectively. Increasingly, businesses are recognising the need to be more flexible to the industry's changing needs and the requirement to process more data (e.g. Intelligent Networks and Automated Interval Meters). There is growing pressure to do 'more with less' given ongoing resource constraints (such as people, fuel and water) and technology is increasingly becoming a key differentiator for businesses. Survey respondents have noted that acquisition of fuel sources is becoming increasingly important due to concerns of declining liquidity in the market.

Organisations are now pursuing supply chain security through long-term fuel contracts or upstream and downstream vertical integration. Vertical integration will become more important as local and international demand for fuels (such as LNG) increases. Acquisition of the fuel sources will drive greater certainty in costs as fuel prices increase.

In the New Zealand context, acquisition of fuel sources will be significantly impacted by the government's proposed moratorium on future thermal generation. In a tightening medium-term gas market, concern has been expressed by industry participants as to the impact of the moratorium on incentives for local gas exploration.

Australia Figure 7: **How important are the following activities for your company over the next 12-18 months?**



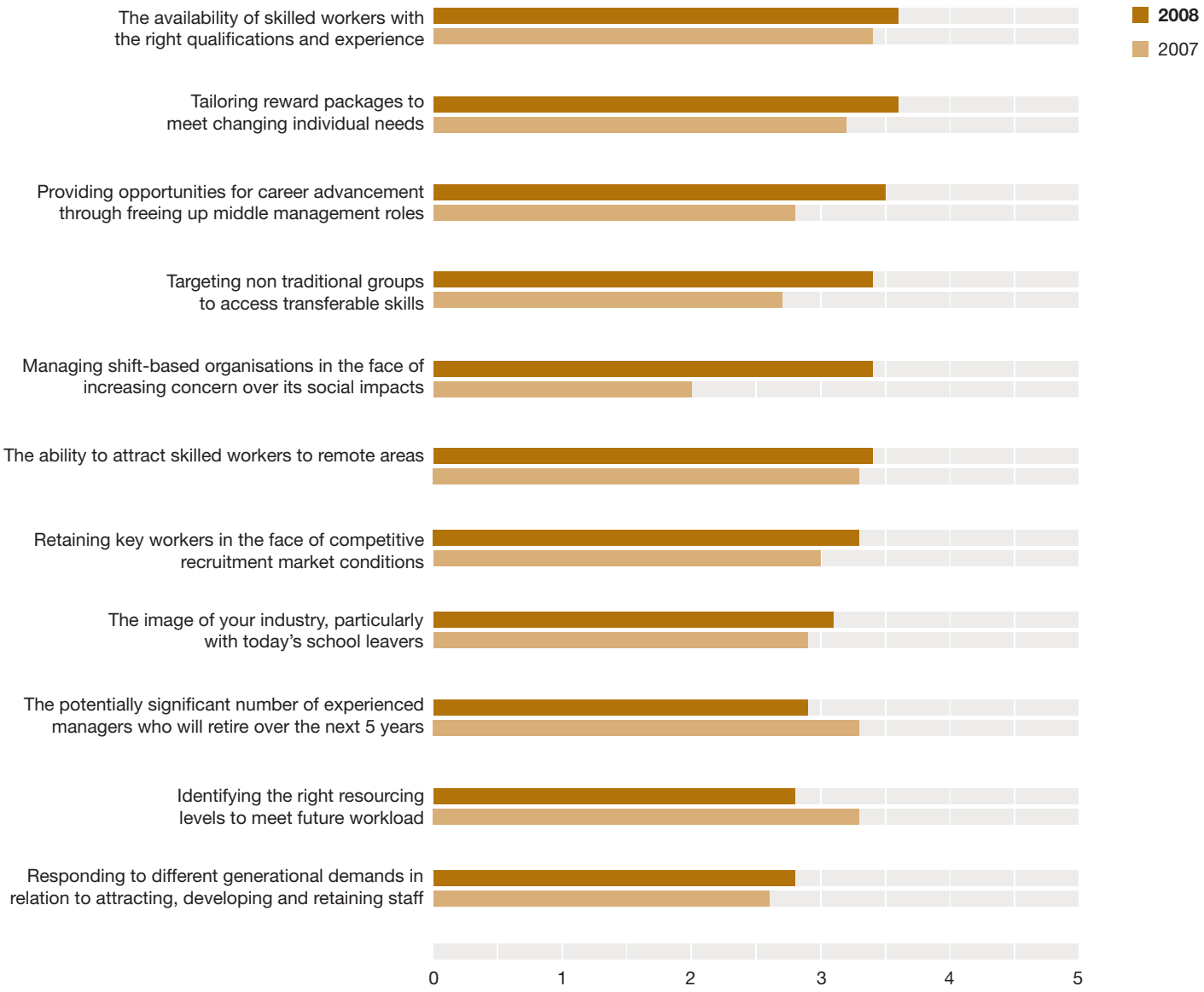

**Note: Note:** Average response. Rate where: 5 = very important; 1 = not important
*Question not asked in 2007
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

## Human resource constraints

The abundance of large infrastructure projects across a range of industries and growing demands for a skilled workforce has resulted in a talent shortage within the energy sector. Intense competition to attract and retain key talent is compounded by the changing workforce demographics. Organisations that have constructed and delivered a compelling Employment Value Proposition, defined a robust candidate sourcing strategy and who are proactive in implementing initiatives to address the ageing workforce will gain a significant competitive advantage.

Multiple strategies are being employed to combat this problem. Some survey respondents have introduced programmes to build the skills of employees, while others have employed more innovative recruitment strategies including offshore resourcing in addition to local recruitment from more diverse groups.

Australia Figure 8: **In light of increasing scarcity of human resources, which areas are of greatest concern to you?**




**Note: Note:** Average response. Rate where: 5 = greatest concern; 1 = least concern
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

## Market structure and regulatory concerns

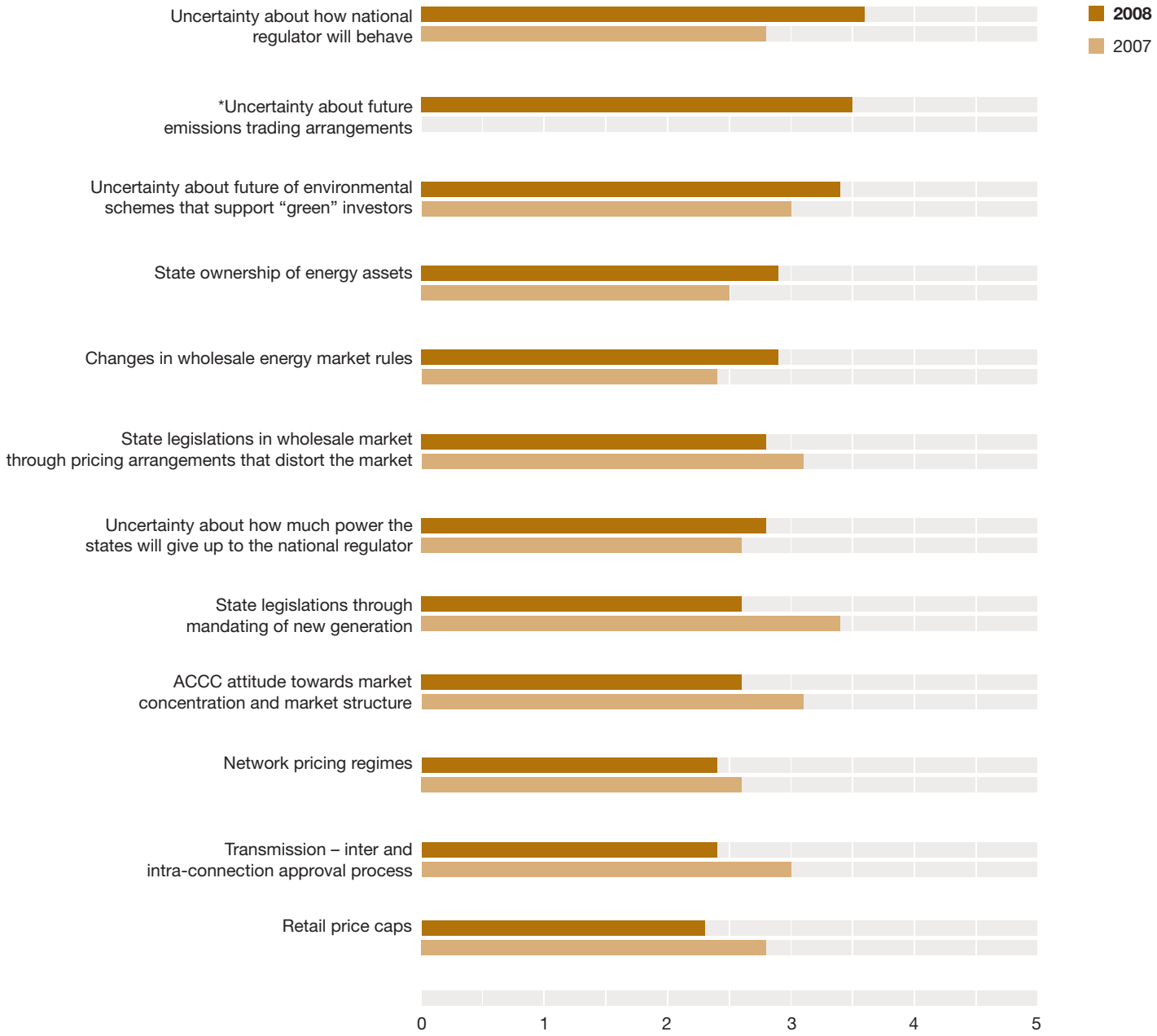
In 2007, the Australian Energy Market Commission (AEMC) determined that fundamental changes to the design of the National Electricity Market (NEM) are not required to address congestion management. The AEMC also decided to abolish the Snowy region by 1 July 2008 which is the first major change to the NEM regional structure since its commencement in 1998. The AEMC's Reliability Panel also determined, despite the tightening supply and concerns over future reliability, that changes to the NEM 'energy-only' market design are not required. Instead the Reliability Panel has proposed a rule change to increase the market price cap from A$10,000 per MWh to A$12,500 by July 2010 (the year emission trading commences).

With the rapid growth of the liquefied natural gas export market and moves by state and territory governments to increase Australia's percentage of gas-fired power generation to reduce carbon emission levels, the future demand and supply of gas for domestic use has emerged as a high priority issue. The Council of Australian Government (COAG) has decided to improve market efficiency by requiring the establishment of a Gas Bulletin Board. The Gas Bulletin Board is intended to facilitate trade in natural gas through the provision of system and market information to all users, potential users and other interested parties in the gas sector, and the management of gas emergencies through the provision of emergency-related information to industry and government. It is also regarded as a precursor to the development of a short-term trading market for gas. COAG has also endorsed a number of reform initiatives to improve the consistency of energy regulation across Australia and remove the duplication of inconsistent state-based regulatory regimes in energy networks and the retail markets.

Despite these recent policy and regulatory decisions, perceptions of regulatory uncertainty as a barrier to investment have increased from 2007 to 2008. Respondents rated highest the uncertainty about how the national regulator will behave. Other perceived major uncertainties affecting investment can be considered under the issues of the 'price of carbon' with the introduction of emissions trading and the potential impact of government-subsidised investment on the private sector. In comparison with last year's survey, respondents no longer perceive the Australian Competition and Consumer Commission's position on market concentration and market structure as a major concern. The recent decision by the Victorian Government to remove retail price caps for domestic customers and the Queensland Government's removal of retail price caps on gas have increased confidence that retail energy markets may finally be permitted to operate without government interference.

In New Zealand, a range of issues around the New Zealand Resource Management Act are considered a disincentive to invest. The Resource Management Act has caused lengthy delays in infrastructure projects due to the widespread consultation processes required in order to undertake new infrastructure investments. In addition the imminent introduction of the emissions trading scheme for energy businesses has created uncertainty over future energy prices. For monopoly activities, the regulatory regime continues to evolve. Due to the ongoing developments, investors face uncertainty about the level of returns they would be able to recover on their planned investments. This is a crucial issue, given the large amount of investment that needs to be undertaken in New Zealand in the short to medium term.

Australia Figure 9: **Which aspects of regulatory uncertainty provide the greatest disincentive to investment in the energy and utilities sector?**

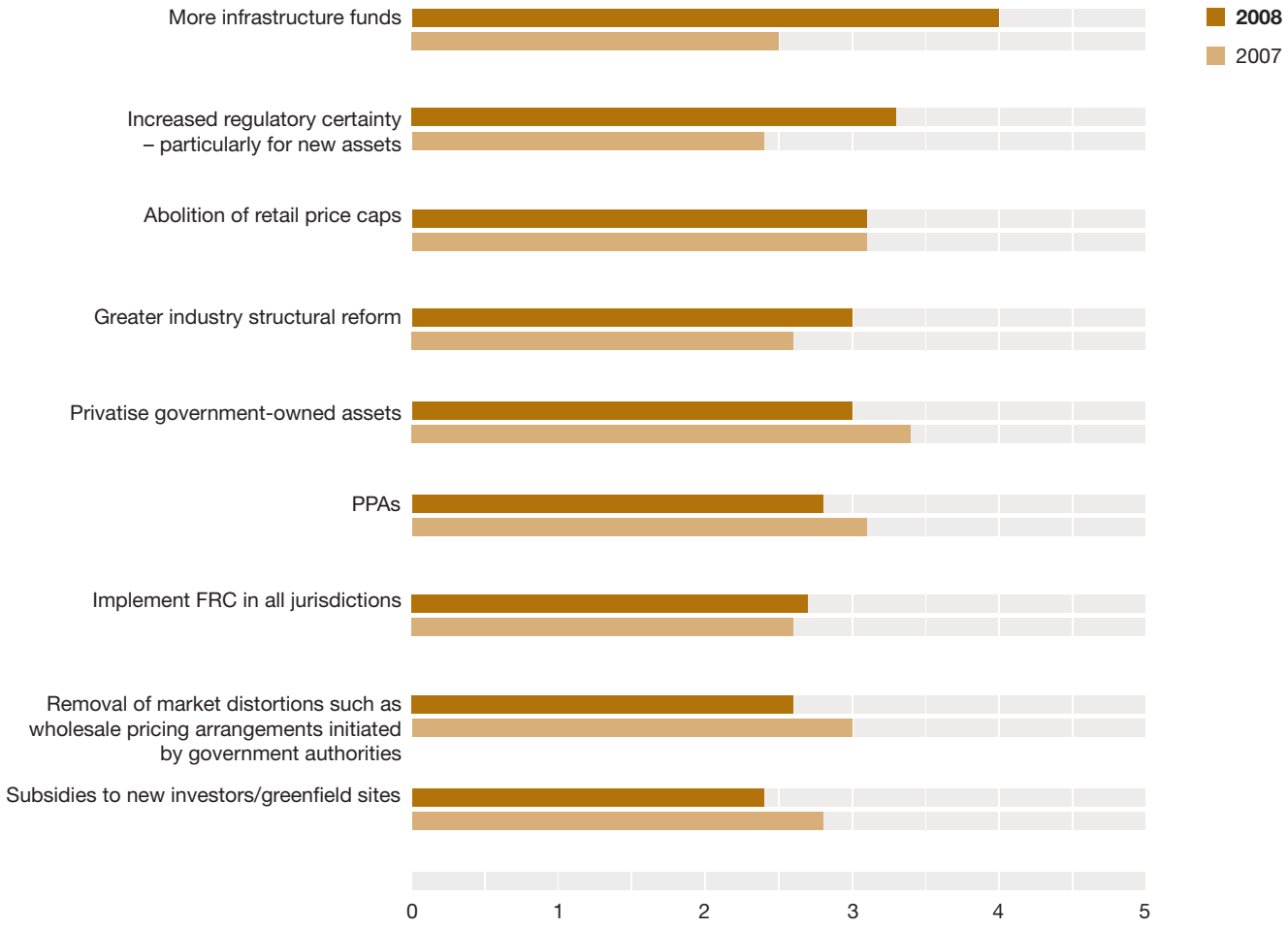



**Note: Note:** Average response. Rate where: 5 = greatest disincentive; 1 = least disincentive
*Question not asked in 2007
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

## Encouraging more investment

Greater regulatory certainty is seen as key to investment (see figure 10). More infrastructure funds, though, are viewed as the most important spur to investment. These are likely to grow in demand as public sector investment decreases. As Australia's state governments sell further assets, the need for further investment funds will increase. Energy infrastructure asset income streams are predictable and subject to less volatility than other investments. Therefore, increased regulatory certainty and abolition of retail price caps remain strong investment drivers. Given that Queensland has recently privatised their retail assets, other states are expected to follow the trend with the Owen report recommending the sale of NSW retail and generation assets.

Australia Figure 10: **What should be done to encourage more investment in energy infrastructure?**




**Note: Note:** Average response. Rate where: 5 = very important; 1 = not important
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

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# Advising on growth in the Australian utilities market

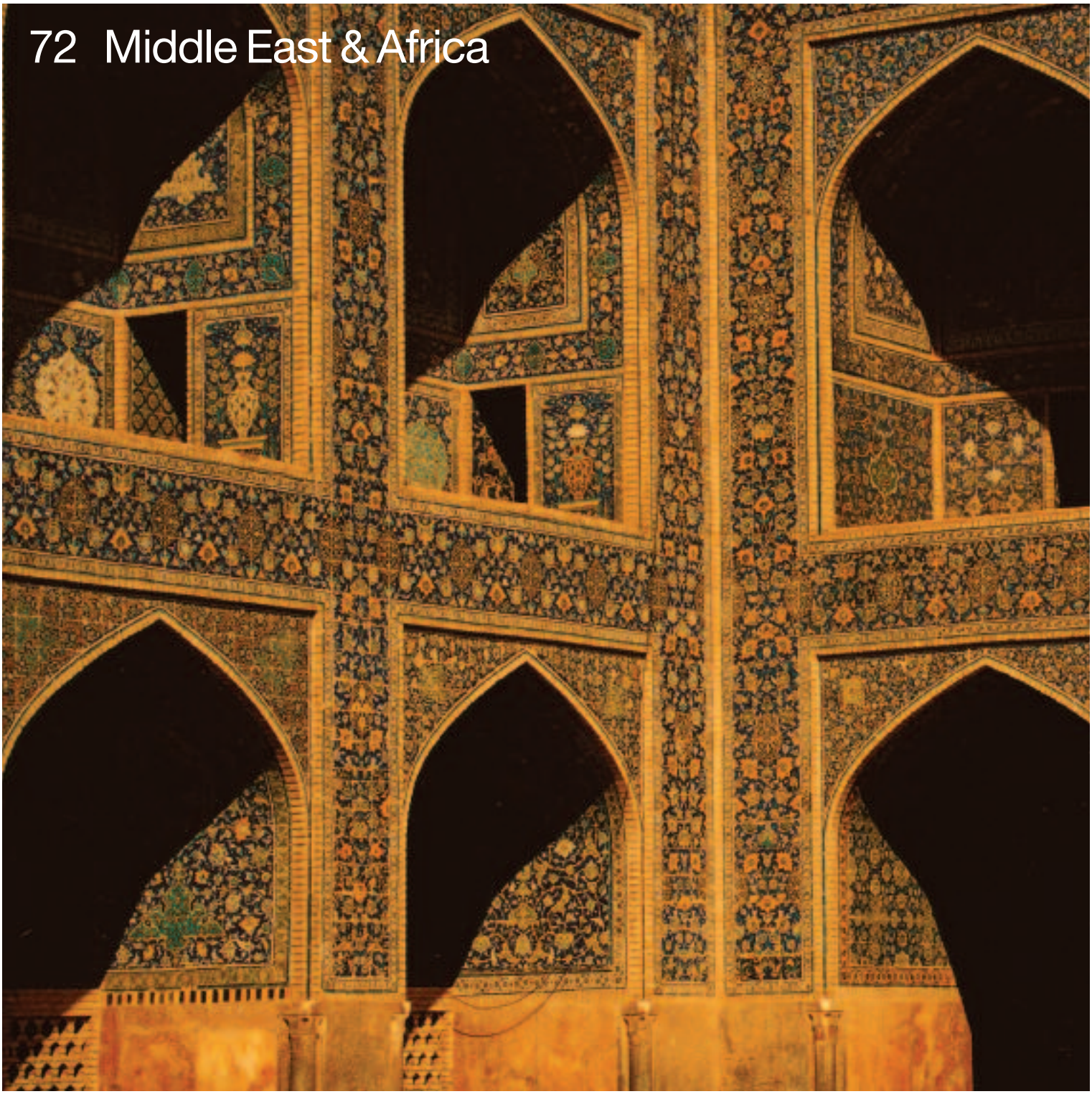
After an October 2000 listing on the Australian Stock Exchange, Alinta grew to become one of Australia's leading energy infrastructure companies. The company's value increased from A$300 million at the float to more than A$6bn in six years, wielding a diversified portfolio of operations and investments that spanned across Australia and New Zealand. In August 2007, a consortium comprising Singapore Power International, Babcock & Brown and three funds managed by Babcock & Brown acquired Alinta.

PricewaterhouseCoopers worked with Alinta from 2002 until 2007 when it was divested to the consortium. The rapid post-listing growth of Alinta was the result of an aggressive acquisition strategy with Alinta operating as an asset manager that had a partial interest in ownership of the underlying infrastructure. The pursuit of this strategy drove a number of client needs: financial and operational due diligence on potential target businesses; tax advice to ensure an efficient structure; and the raising of funds necessary to complete the acquisitions. In the latter case PwC fulfilled the role of the investigating accountant for public capital raisings and prepared reports for banks in support of debt financing.

In 2006, PwC helped Alinta successfully finish the lengthy process of acquiring the infrastructure assets of Australian gas and electricity provider AGL. The two-year transaction went through a number of phases and was complicated by the fact that Alinta only had access to AGL's publicly released financial information. PwC was given the role of finding ways to fill the information gaps to ensure the acquisition and anticipated synergies would not expose Alinta and its shareholders to undue financial and tax risk. The firm's due diligence work, including detailed tax and accounting modeling assistance in these areas met the requirements of the Australian Securities and Investments Commission (ASIC) and the Australian Tax Office. The resulting regulatory approvals contributed to an overwhelming positive vote from shareholders. Alinta was able to complete the transaction, nearly doubling the Alinta market capitalisation overnight.

In 2007, Alinta surprised the investment community with the news that a group within the company were planning to buy and reshape it. Subsequently, its board considered both an internal restructure and an auction. This process resulted in the sale to a consortium of Singapore Power and three Babcock & Brown infrastructure funds which between them split up the national portfolio of pipelines, plants, networks and trading businesses.

PwC was on both sides of this transaction, representing Alinta as well as the Babcock & Brown consortium. This demonstrated that PwC's teams could work independently and represent two parties in the same transaction to the satisfaction of both parties. The various teams' deep industry experience helped streamline this complex transaction. The successful completion of this deal, for both sides, was also a result of the fact that PwC has worked closely with investment banks who are increasingly involved in the utilities sector. We know how to approach transactions in this area which are quite unique in that they do not involve the analysis of trends and products but require an understanding of the structure of the deals and the cash flows that are needed.

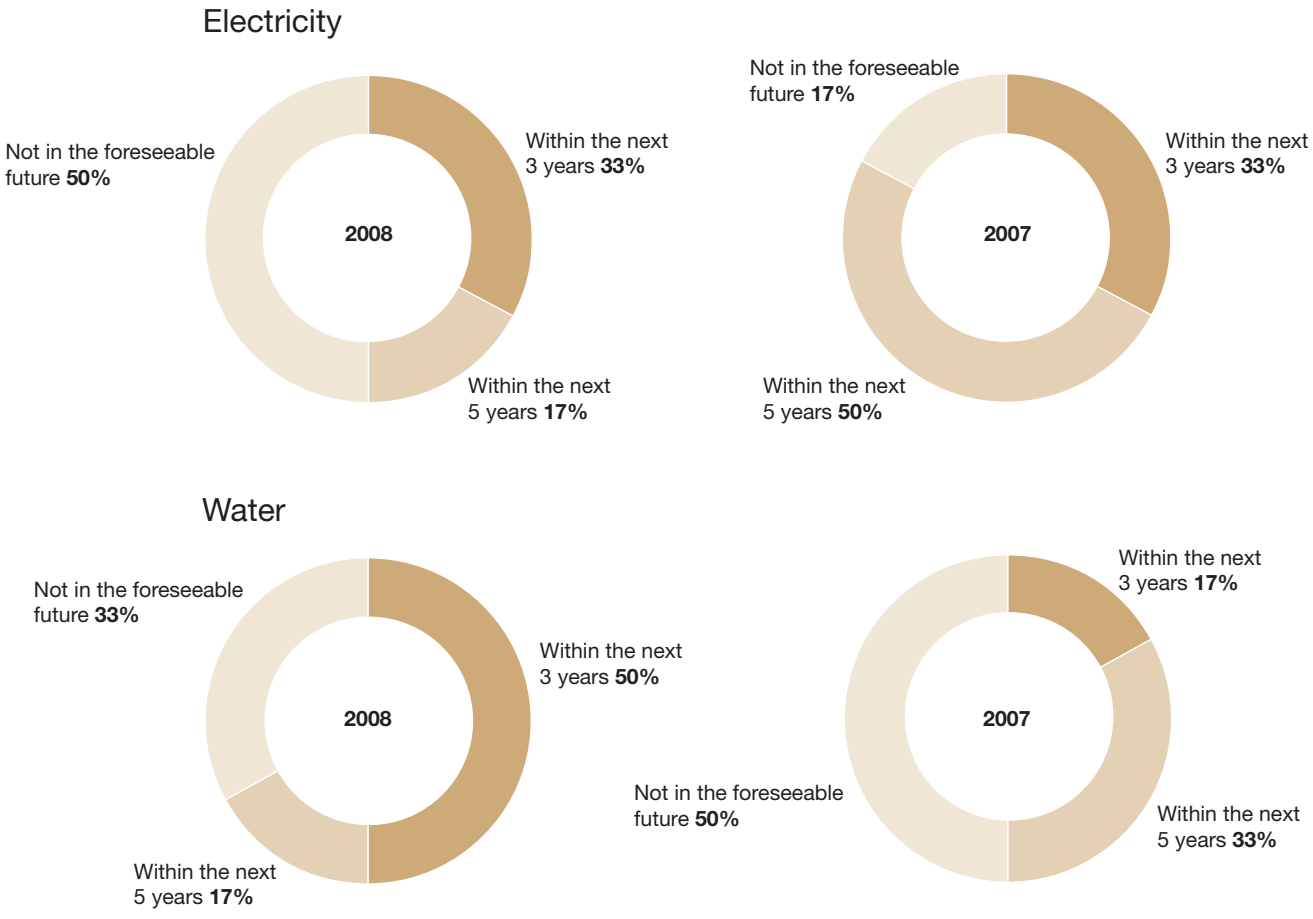


With expanding populations and economic growth, the need for additional power infrastructure is acute but materials, contracting resources and skills are in short supply.

# Middle East

The Middle East region contains a variety of market situations. Liberalisation is an important trend but is at different stages and moving at different paces. Fewer than 20% of respondents to last years' survey were in monopoly situations in their markets but, this year, the sample has a much higher proportion of such markets – 67% of respondents have a monopoly in electricity and half in water. Nonetheless, half of respondents expect their electricity market will liberalise within the next five years and two-thirds expect water to do likewise (see figure 1).

Middle East Figure 1: **Within what time period do you believe your market will liberalise?**




**Note:** Average responses only. % share of respondents
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

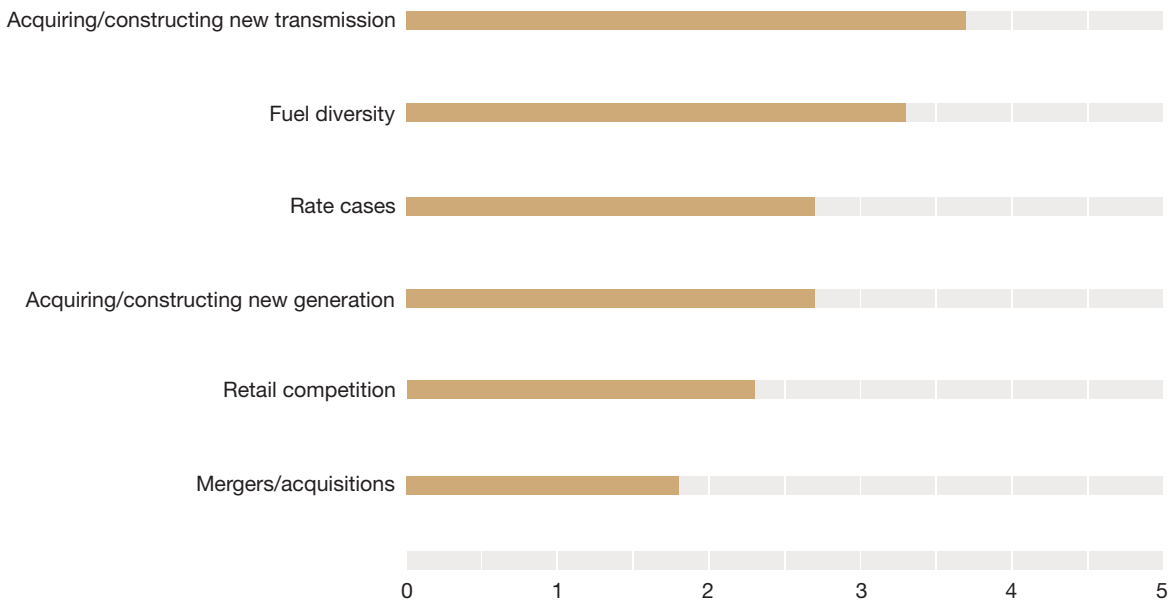
## Liberalisation

Egypt provides an example of market liberalisation. The country is set to open its electricity market to competition between suppliers, ending the government's monopoly. A new electricity law, to be phased in over a six-year period, will allow customers to buy power directly from private or public sector generating companies. The law will also strengthen the regulator, the Egyptian Electric Utility & Consumer Protection Regulatory Agency, which will oversee the transition to the liberalised market. The regulator will organise, monitor and help develop the sector, including setting power generating tariffs for the government-backed utilities and transmission and distribution tariffs across the sector. The largest customers will be the first to benefit from the new open market. During the first phase, consumers connected to the grid at a capacity above 20MW will have access to the competitive market. This will affect 100 industrial customers, which together account for 30% of electricity sold every year. Phase two will affect 4,000 customers who use at least 500kW. They account for 20% of the market. A third phase could involve residential and small customers but the government has yet to decide if this will happen.

## Infrastructure challenges

The construction of new power generation and transmission capacity heads the list of the most important focus for survey respondents over the next year (figure 2). With expanding populations and a growing industrial base, the need for additional capacity in the region is acute. The region's utilities are eager to ensure that new power and water capacity is installed as soon as possible. All of those questioned believe that private local investors will increasingly finance future investments in the utilities sector. However, booming activity in the power and water market means that both materials and contracting resources are in a short supply, driving up costs.

Middle East Figure 2: **Over the next year, what areas will the company be focusing on?**




**Note:** Average response. Rate where: 5 = high focus; 1 = low focus
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

Engineering procurement and construction (EPC) contractors are already overstretched and the situation is likely to get worse before it gets better. The cost of EPC for power has almost doubled from US$450 a kW of capacity in 2003 to US$850 a kW in 2007, while desalination project costs have risen by 40% from US$5 a gallon in 2003 to US$7 a gallon last year. Project developers must raise more cash to deliver the same thing. But with spiralling costs a key concern, lenders are being cautious and finance margins are increasing. Higher capital costs mean that cash flows are stretched more thinly and there is substantial reliance on international debt capital. It also means that more international debt sources will become important.

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## Strategic, regulatory and contract issues in the Middle East

The Middle East is the energy powerhouse of the world. PricewaterhouseCoopers is involved in a range of assignments across the utilities and wider energy sector. These include the following:

**New frameworks for gas regulation**
We have advised on the development of a natural gas industry. As lead advisor, we provided the financial, commercial, legal and technical inputs required to create the appropriate framework in which the new gas company would operate. Our work included advice on gas supply issues; creating an economic model of the gas system; designing an appropriate gas transportation tariff system; and commenting on the draft Gas Law.

**Designing new power regulation**
We have advised on the setting up of a national electricity regulatory authority. Our work involved advising on issues of institutional planning and organisational design; identifying the role of the regulator and the skills and staffing required to carry out those roles, and the interim arrangements during the transitional period while the regulator was being established.

**Contract disputes**
We were engaged as an expert witness in an arbitration concerning a price revision dispute under a cross-border, take-or-pay gas sale and purchase agreement. Our role involved analysing the economic, gas and energy market issues relevant to the issue in dispute.

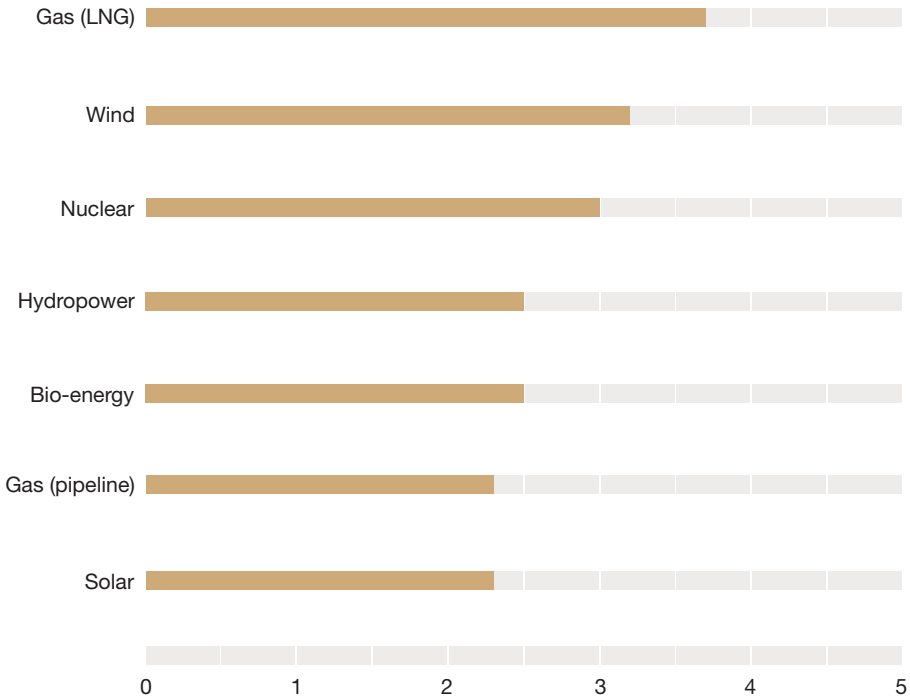
**Liquefied Natural Gas**
We have acted as lead advisors to several companies considering the export of liquefied natural gas (LNG) from North Africa to markets in Europe and the US. Our work involved analysis of the financial and commercial feasibility of each element of the value chain, from upstream gas production to liquefaction, shipping, regasification, grid entry, offtake arrangements and gas marketing, together with options for commercial structuring, partner selection and finance raising.

## Fuel diversity

Survey respondents also identify fuel diversity as a key focus over the next year. As oil prices have increased significantly during the recent period and are to be expected to increase further, the concentration on gas gets more and more important. However, natural gas is not sufficiently available. Demand for gas in the region is, of course, not exclusively driven by power generation and desalination. Power and water sectors are constantly competing with the needs of the industrial and oil sectors. The lack of availability of natural gas has resulted in a significant increase in utilities' overall fuel costs.

The importance of gas is reflected in the fact that respondents single out liquefied natural gas (LNG) as the most important future influence, out of a range of fuel sources, on electricity pricing in the region. Unlike pipeline gas, of course, LNG can be shipped to a much wider range of overseas markets. Major LNG facilities are coming onstream in the region and the growth of the international LNG trade will have a bearing on the availability and pricing of gas supplies for the local regional gas market. Indeed, in anticipation of continuing gas shortages, the region has begun exploring alternatives for power generation. Coal, for example, has been proposed as a solution for both Oman and Dubai but there is uncertainty about global coal supplies and a lack of local availability.

Middle East Figure 3: **Which of the following alternative sustainable energy sources do you believe will affect competitive electricity pricing in your region in the near future?**

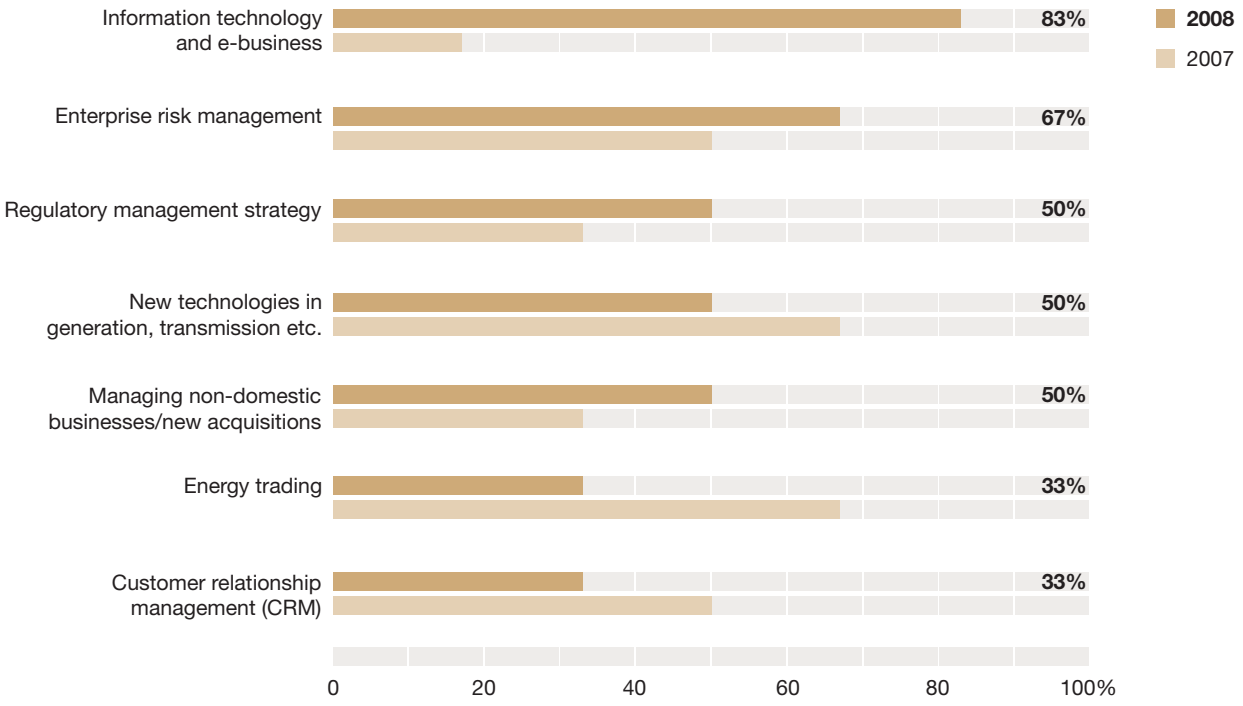



**Note:** Average response. Rate where: 5 = high focus; 1 = no focus
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

## Business modernisation

Rapid growth in the demand for power and water has resulted in an extraordinary expansion of business for the utility companies in the region. According to our survey respondents, this has been matched by a rapid growth in investment in information technology and e-business – up from 17% in 2007 to 83% in 2008 – as companies modernise their businesses. In addition, many companies are also prioritising investment in enterprise risk management systems as well as other investments (see figure 4).

Middle East Figure 4: **In which areas of your business have you invested recently?**




**Note:** Average responses only. % share of responses
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

With expanding populations and a growing industrial base, the need for additional capacity in the region is acute.

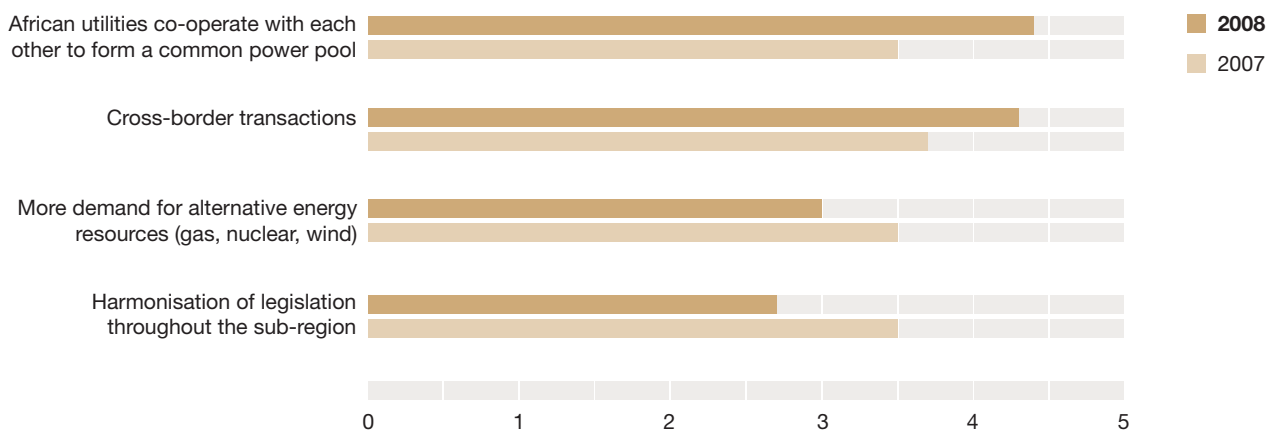
# Africa

African utility companies continue to face the challenge of meeting the growing demand for power driven by the economic growth experienced in the last few years. The need for investment in additional capacity and resources in all areas of the electricity supply value chain has seen countries, governments, business and other stakeholders working together to develop solutions and take action to deal with current supply shortages in the region.

## Outlook for pan-African initiatives

Survey respondents are more optimistic about the outlook for key pan-African initiatives compared with last year's survey. The likelihood of co-operation between utility companies to form a common power pool is rated much higher than in 2007 and respondents are also more optimistic about the prospects for cross-border transactions. In contrast, though, respondents are more pessimistic about the prospects for legislative harmonisation and about demand-led development of alternative energy sources (figure 1).

Africa Figure 1: **In keeping with the NEPAD principles of connecting Africa, how likely is the following?**




**Note:** Average response. Rate where: 5 = very likely; 1 = unlikely
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

## The capacity challenge

Survey respondents expect increased demand for electricity in the next few years to spur both new investment in generation capacity and a return to service of stations that were previously mothballed. The need for new capacity continues to be highlighted by regular power outages in many countries throughout Africa, including the leading economy, South Africa. Lower generation reserve margins and ageing plant requiring maintenance/refurbishment in South Africa have resulted in an accelerated build programme, increased demand-side management targets and contingency planning for power outages in the country.

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## Restructuring electricity distribution in South Africa

As part of the South African Government's Electricity Distribution Industry Restructuring Strategy, six 'wall to wall' REDs (Regional Electricity Distributors) will be established through the consolidation of Eskom and 187 licensed municipal electricity distribution businesses. The establishment of the new companies will be overseen and controlled by the Department of Minerals and Energy, through the EDI Holdings company that has been established for this purpose.

The electricity distribution business at most of the 187 municipalities are highly integrated with other municipal activities with the surpluses generated from electricity services generally used to subsidise other municipal services. Ring-fencing is a key initial step in the restructuring process for these municipalities, during which all existing electricity distribution processes and resultant assets, liabilities, revenues, costs and obligations are separated from the current parent organisation, in preparation for business transfer to the REDs

Ekurhuleni Metropolitan Municipality (EMM) is the second largest metropolitan municipality in South Africa. PricewaterhouseCoopers was appointed in 2005 to ring-fence EMM's electricity and energy business unit, in preparation for business transfer, with project completion achieved in 2007. Key project phases delivered were:

- Ring-fencing and assessment of the current state of operations.
- Design of the optimum future business within the new legislative requirements.
- Implementation of the future business; and
- Maintenance of the future business.

The EMM electricity and energy business unit faced a number of challenges, including:

- Insufficient maintenance of assets.
- Shortage of skilled technical staff and support service staff, such as HR, legal and finance.
- A range of accounting and financial procedure problems such as incomplete asset registers, financial items unable to be attributed directly to the electricity services which then needed to be apportioned in an appropriate and relevant manner; and
- Lack of proper funding strategies.

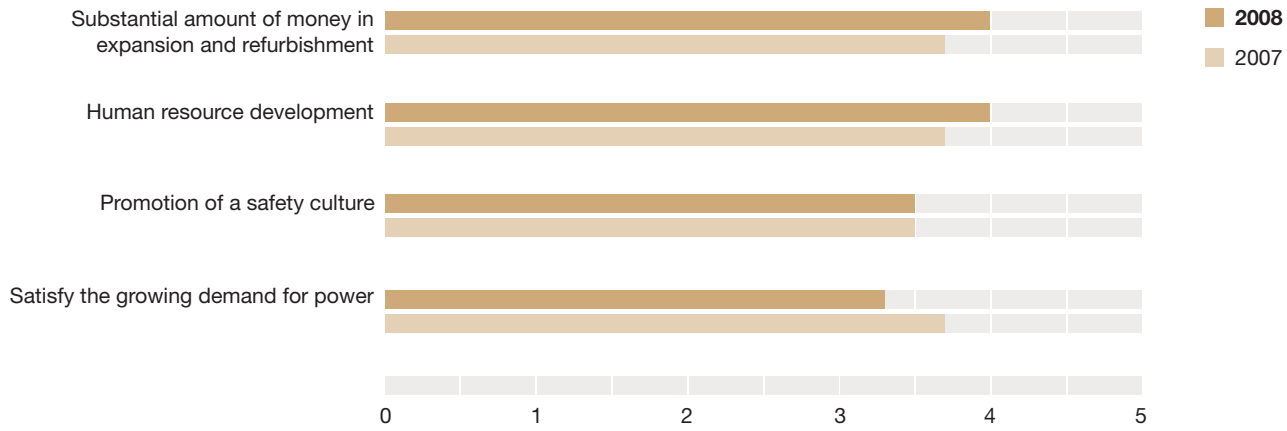
PwC provided client support and advice at strategic, tactical and operational levels to meet the restructuring challenges faced. We provided a boxed solution incorporating various advisory solutions to deliver one project. Project implementation was focused around a number of workgroups (finance; HR; process/operational; IT; engineering; legal and tax) which each delivered a specific service solution, all of which were interdependent and necessary for the success of the project.

Upgrades to existing stations, return-to-service projects, cogeneration, pumped storage schemes and open cycle gas turbine projects together with a new baseload 4,788MW coal-fired power plant will add much needed generation capacity in the region. However, shortages of knowledge and skills are becoming a critical issue for utility companies. Skills development and retention strategies are high on the agenda for most utilities. Figure 2 shows that utility companies believe that human resource development will be just as important for the future of the sector as funds for expansion and refurbishment.

## Cleaner energy

Alternative sustainable energy sources and rising fuel costs will affect electricity pricing in the region in the future. Survey respondents expect solar and hydropower, in particular, to have an impact in the future energy mix (figure 3). The potential for both in Africa is substantial and the big increase in expectations around solar, compared to last year's survey, reflect the greater optimism among survey respondents that technological progress will accelerate the impact of this source of power. Indeed, across the board, it is noticeable that expectations of the impact of all alternative fuel sources are higher compared with last year's survey. This is likely to be in part because of the gathering momentum behind the prioritisation of clean energy but, also, in recognition of the higher costs of such generation compared to traditional coal plant.

Africa Figure 2: **What are the priorities for the sector?**

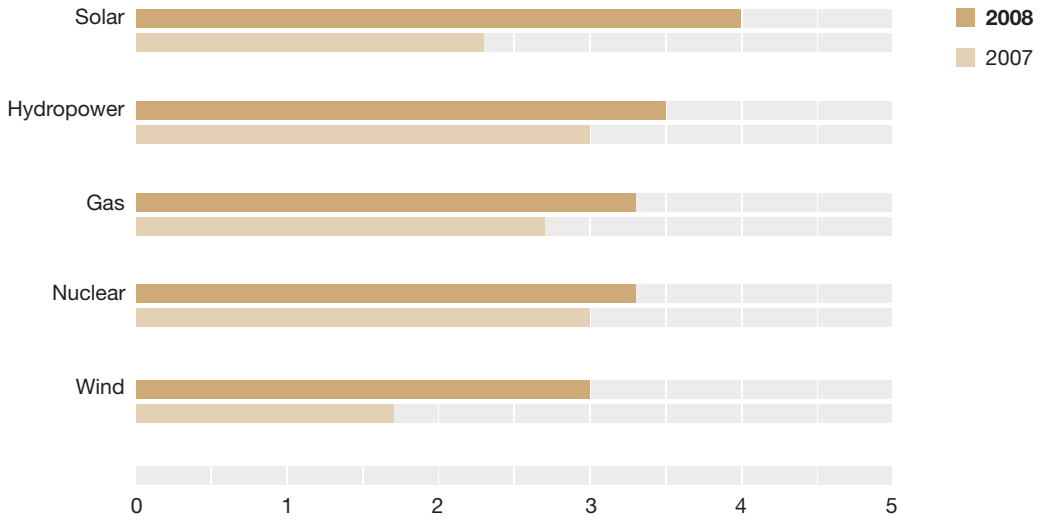



**Note:** Average response. Rate where: 5 = high priority; 1 = low priority
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

## Looking ahead

South Africa is by far the dominant generator and user of electricity through state-owned company Eskom whose power stations are mainly coal-fired. Eskom's coal-fired stations account for approximately 78% of output. However, with a strong government commitment to nuclear, there are indications that this fuel mix will change. The Nuclear Energy Corporation of South Africa expects nuclear capacity to increase to approximately 27GW. Across the continent there are various projects looking at increasing supply to development corridors and spatial development initiatives. On the risk side, coal price volatility represents the single biggest risk due to the dependence on this fuel and there is unlikely to be any immediate change to this risk over the next few years.

Africa Figure 3: **Which of the following alternative sustainable energy resources, or mix of resources, do you believe will affect competitive electricity pricing in your region in the foreseeable future?**




**Note:** Average response. Rate where: 5 = high impact; 1 = low impact
**Source:** PricewaterhouseCoopers, *Utilities global survey 2008*

The need for new capacity continues to be highlighted by regular power outages in countries throughout Africa.

# Looking ahead

Sweeping changes lie ahead. Two big sea changes are affecting the industry. First, there has already been a significant shift in pricing patterns. All fossil fuels have become a lot more expensive which has given other forms of generation a boost in the market, increasing the value of renewable generation or other generation such as nuclear that does not produce carbon. The second big change is the growing commitment of governments to deliver a shift in the fuel mix in response to worries about security of supply and climate change. The next five to ten years will test how far this commitment will spread and intensify. It is a period that is likely to see more intervention to put a price on carbon.

The implications of these two forces on the future are likely to be profound. Just think how much the landscape has changed in the past without these forces in play. As recently as 1980, a country like the UK had no gas-fired power generation – now 40% is gas-fired. At the beginning of the 1990s, no wind turbine existed in a country like France – now they are a recognised part of the landscape in countries around the world.

These changes occurred over a 15-25 year period. The shift towards greener and more distributed generation is likely to be on a similar timescale. But the extent to which the future generation landscape will change will rest critically on the economic cost of change, the existence and effectiveness of future economic signals for the price of carbon, and the willingness of government and society to absorb extra costs and become more energy efficient.

Within the power utilities industry, the change in outlook about the range of generation technologies that will have an impact in future markets is rapid – many more survey respondents are now expecting that wind, nuclear, solar, distributed and other generation will be significant in the future. But given that coal and gas will remain mainstays in the generation mix, many observers will feel that there needs to be greater recognition that it will be changes to these largest sources of generation that will be vital if there is to be a real impact on GHGs. In this respect, it will not be the landscape of smokestacks that will change but the technology inside the stack.

The coming decade is also likely to see landmark change in industry structure. Within the current utilities footprint there is already repositioning in response to regulatory concerns about industry structure and bundling. Momentum towards separate networks will continue. But the bigger changes will be played out around the boundaries of the sector and the interfaces with power equipment and technology suppliers, oil and gas companies and mining companies. Technology itself will play a role in this interface. Carbon capture and storage, for example, embraces both the overground world of utility plants and the underground world of mining and the oil and gas industry.

There is likely to be a blurring and a convergence of the fuel supply chains upstream and the utilities downstream driven by the desire to secure supply and to secure markets. The national oil companies and oil majors are increasingly going to customers, for example in LNG, which is bringing these companies into the utilities marketplace. Similar shifts are taking place on the equipment and technological front with utility companies and equipment providers alike seeking to secure ownership of technological assets and market space. As we have seen with the strategic partnership between Westinghouse and uranium supplier, Kazatomprom, these moves will extend upstream to include resources as well as downstream to the utility sector.

Increasingly, the energy utilities landscape will be led by companies with global brands. The companies that have the most success will be those with big balance sheets to make the huge investments that are required in nuclear, carbon capture and storage and other technologies. The vital role of power, however, will mean that national interest will interplay with globalisation. In some markets, ownership may remain nationally focused as governments reach for an element of protectionism to limit foreign ownership. In other markets, we are likely to see the emergence of big national champion companies, such as has occurred in Europe. These national champions, whether from Europe, the Americas, Asia or Africa, will increasingly operate outside of their own immediate markets and some will compete with other players to become the global energy brands of the future.

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## Methodology

*A world of difference tomorrow's power utilities industry* is based on research conducted between January-February 2008 with 118 senior executives from 115 utility companies across 37 countries. Research covered the four major regions of Europe, the Americas, Asia Pacific, Middle East and Africa. The majority of utility participants were Senior Vice-Presidents and Presidents, CEOs or other senior managers. No more than two interviews were taken from any individual company, although multiple respondents were taken from some countries. The survey sample is comprised of power and gas utilities (suppliers, transmission companies, traders or generators) that have developed a broad range of interests in a number of complementary utility sectors or other regions.

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