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Laka digitizes books and magazines from the international movement against nuclear power.

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Laka plays with, amongst others things, its information services, an important role in the Dutch anti-nuclear movement.

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Industries
Energy, Utilities & Mining

A world beyond recession*

Utilities global survey 2009

Utilities global survey 2009

A world beyond recession*

credit crisis financial crisis

economic growth widespread

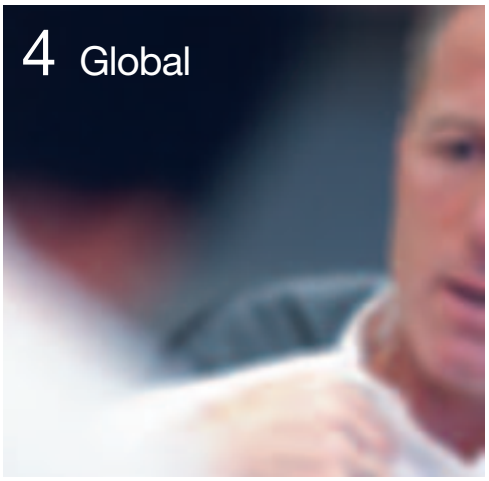
receding recession being ready

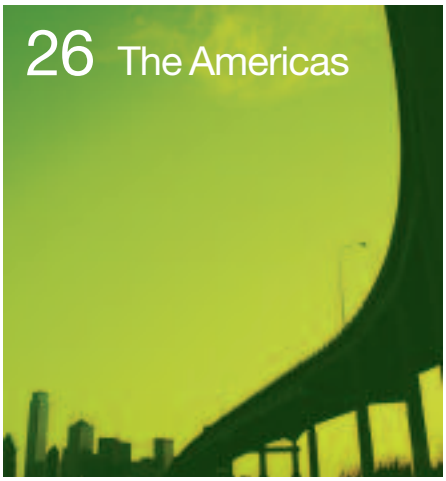
world insecurity future energy

climate change debate sustainable

In the space of the past 12 months, utility companies have found themselves in a very different world with a series of momentous events – the collapse of giants of the banking system, the credit and wider financial crisis, the reversal in demand and price growth, and outright recession in many major markets. But the time horizons required for planning in the energy sector require companies to plan and think a long way ahead. *A world beyond recession* looks at the impact of the events of the past year, through the views of senior utility company executives, and ahead at the world that lies beyond the downturn.

recession
to power the upturn
security
cleaner power

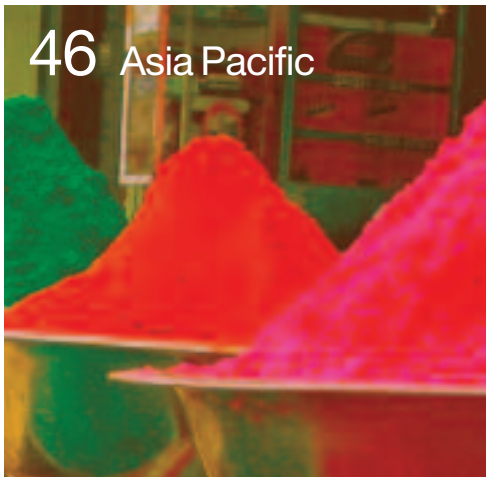


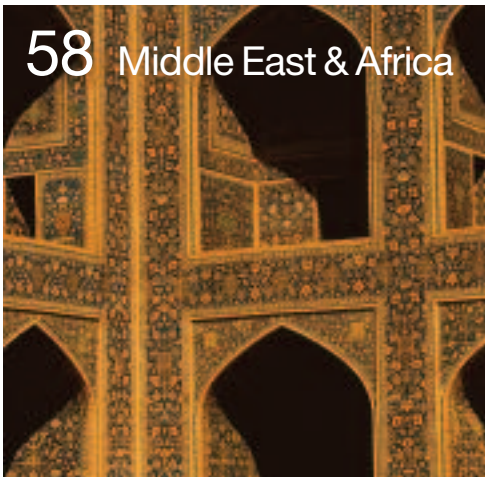


Utilities global survey 2009

"We are experiencing a transformational economic crisis – one that is on course to fundamentally change globalization well beyond the domain of international finance"

Klaus Schwab, founder and executive chairman of the World Economic Forum





This year's survey interviewed 69 senior power utility executives from 65 utility companies in 39 countries from 4 major regions.

The Americas
Argentina
Canada
Chile
Ecuador
Mexico
Peru
United States

Europe
Austria
Czech Republic
France
Germany
Hungary
Poland
Portugal
Russia
Spain
Sweden
United Kingdom

Asia Pacific
Australia
India
Korea
Malaysia
New Zealand
Philippines
Singapore
Thailand

Middle East & Africa
Botswana
Ghana
Israel
Jordan
Kenya
Mauritius
Namibia
Nigeria
Qatar
South Africa
Tanzania
United Arab Emirates
Zambia

Energy utility companies find themselves operating in a very different world from just a year before. It is a world shell-shocked by the rapidity of the financial and economic collapse, where previous certainties have been replaced by uncertainty, where faith in markets and regulation has been shaken and where recession has taken the place of growth.

For utility companies, however, the timescales required for imperatives such as infrastructure renewal, new generation and greener energy reach beyond the recession. The very business of power requires them to stretch their horizons further. The investment required in the sector is considerable. Yet the financial crisis has tightened the availability of capital. Governments are debt-laden, clouding the outlook for future subsidy for greener energy, and the downturn has dampened demand, particularly from big industrial consumers.

Utility companies face a delicate balancing act. They need to make the adjustments necessary to steer through the changed economic and financial environment but also maintain a long-term horizon. Fewer investments will surely mean reduced reserve margins in the future with the danger of higher price spikes and greater competition for limited supplies when the evolving global recession recedes.

Each year PricewaterhouseCoopers goes to the heart of boardroom thinking in energy utility companies with a survey of senior utility executives across the globe. In 2008, our *World of difference* report mapped the enormity of the changes witnessed in the last 10 years and those lying ahead in future decades. Our 2009 report, *A world beyond recession*, looks at the impact of the economic downturn and financial crisis on the sector but, also, beyond to the time horizons that are important for long-term energy planning.

We interviewed about 70 executives from leading power utility companies in major markets around the world to gain their perspective on the implications of this very different world environment. We also include the viewpoints of CEOs from a number of leading utility companies in different parts of the world.

Manfred Wiegand
Global Utilities Leader

Credit crunch clouds outlook for future targets

Utility companies have to judge the pace and level of investment programmes to respond to a complex mix of future demand, energy security and climate change drivers. One result of the current market environment has been to cast considerable doubt on whether investment will come forward in a timely manner to keep pace with future demand for power and climate change targets. Two-thirds (67%) of our survey respondents report that a shortage of capital is having a high or very high impact on their activities.

Investment barriers heighten

The development of new generation capacity and the renewal of existing generation plant is a priority area for most companies; 83% are seeking to make medium to large investment in new generation and three-quarters are seeking to do likewise in transmission and distribution. However, the senior utility company executives in our survey are worried about the high costs and high levels of cost uncertainty associated with projects. Two-thirds cite problems in securing finance as a medium or high barrier to project development. Skill shortages and access to good procurement capability also continue to pose challenges for many companies.

Risk controls set to red alert

The current environment is heightening energy trading risk. Liquidity in the market is a major concern. Eighty-six per cent of respondents indicated that reduced liquidity in energy trading markets was having an impact on their companies, with 60% of all respondents rating this impact as high or very high. Customer credit risk is also identified as an area of major concern and 90% of respondents reported a high or very high impact of increased sales and retail credit risk. Companies are mindful of the risks of customers going into liquidation, defaulting on payments, bargaining over delivery or simply shutting down plant and requiring less supply.

Maintaining a focus on climate change

2009 will be a watershed year for climate change regulation with world leaders seeking to agree a successor to the Kyoto Protocol. Utility companies in our survey emphasise the importance of greater clarity of climate change policy but express concern that the economic recession is undermining the chances of an effective response to climate change. Asked if the economic recession would slow down responses to climate change, 79% felt it would with two thirds of the 79% saying it would have a high or very high slowdown impact. Many of those surveyed also thought that a return to high energy prices would dilute commitment to environmentalism.

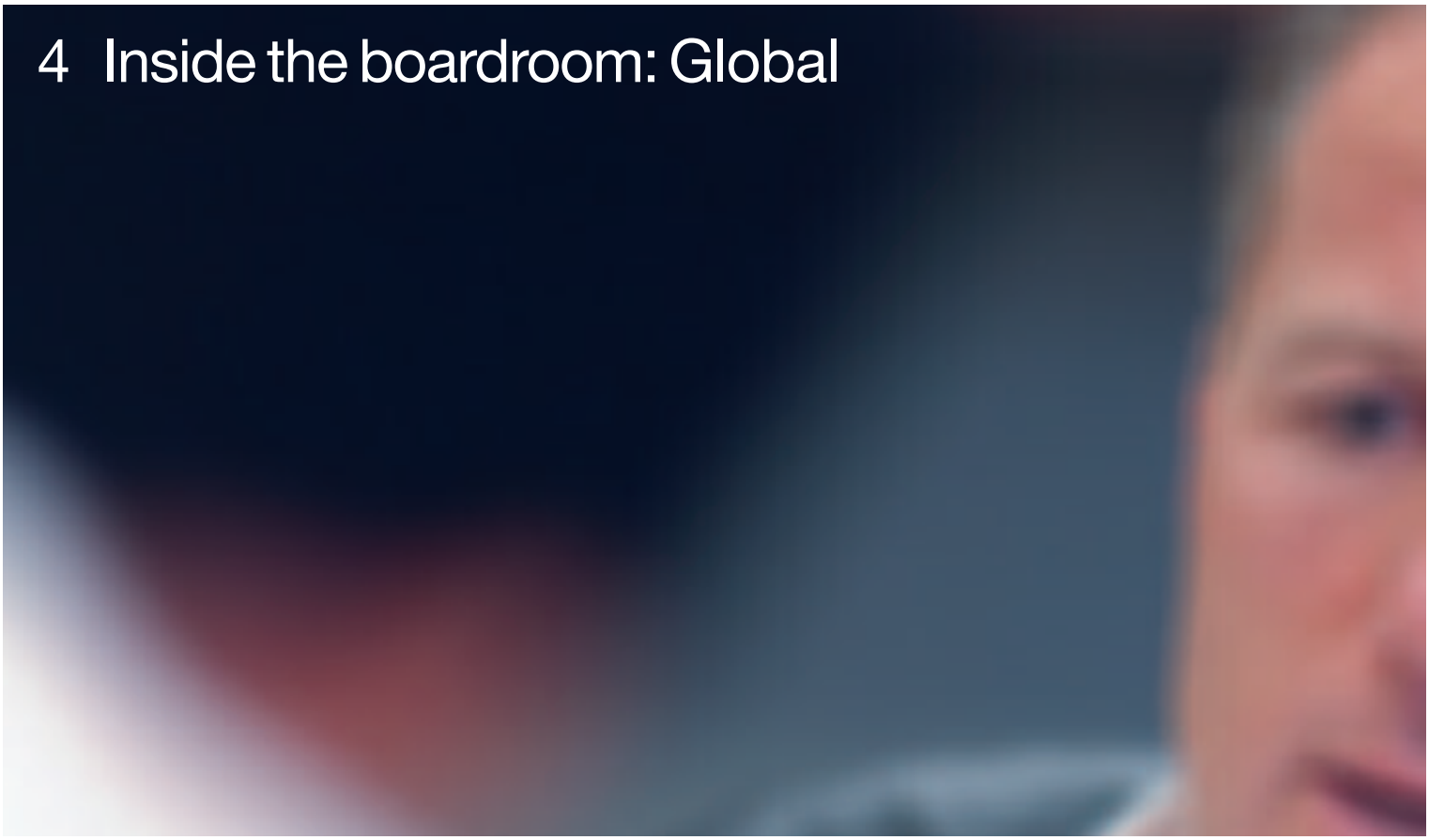
Economic incentives needed to boost renewables in the mix

Nearly three-fifths of respondents (59%) feel that their renewable energy investment programmes are being affected by the lack of clarity from governments on renewable energy targets and financial support for renewable energy. The importance of greater certainty on both targets and economic mechanisms to support renewable energy is highlighted by the fact that, even coming off the back of a period of record high power prices, only 28% of respondents believe that unsubsidised renewable power can compete commercially against fossil fuel generation.

Technology holds the key

Technology will be central to future growth and competitive advantage. The importance of technology for key developments, such as energy efficiency and the expansion of nuclear power, has led many survey respondents to pinpoint power equipment and technology companies as a more significant competitive threat than even direct competition in the retail market by other utility company home market rivals. Technological innovation is seen as central to a range of key developments in the sector. In the coming decade, technological innovation is seen as having most new impact on energy efficiency, solar power, combined heat and power, distributed generation and combustible renewable generation. Looking further afield, carbon capture and storage will be essential for the sector's contribution to the mitigation of climate change.

4 Inside the boardroom: Global



Risk

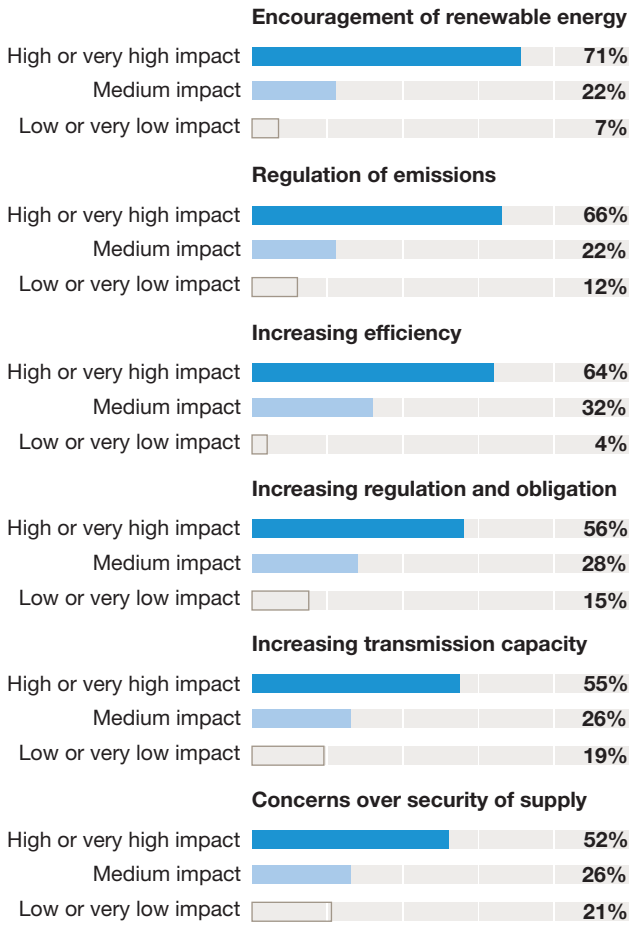
Economic recession and the financial crisis have heightened the risks that utility companies must manage. A major area of risk for utility companies comes from balancing both short-term and long-term supply and demand. In turn, that means judging the pace of investment programmes to respond to a complex mix of future demand, energy security and climate change drivers.

An estimated cumulative investment of US$13.6 trillion is needed by the power industry in the period to 2030 according the reference scenario model used by the International Energy Agency. Although this outlook predated the intensification of the economic downturn in late 2008 and early 2009, the timeframe for the model and, indeed, the timescales required to develop new generation capacity, particularly in nuclear, take the industry's horizons beyond even a deep recession. Moreover, much of the projected electricity demand growth occurs outside of the OECD and this rebalancing of world demand is likely to remain a key trend even during recession.

The investment challenges for the sector flow from three principal imperatives – renewal, diversification and growth. The need for renewal of ageing infrastructure may be alleviated by falling demand but the underlying requirement to replace or upgrade plant and networks will not go away. Similarly, the need for diversification, driven by the twin imperatives of greater energy security and responding to climate change, remains in place. Energy security concerns have again been highlighted with interruptions to Russian gas supply to Europe in early 2009. On the climate change front, the latest scientific consensus on climate change indicates that the timetable for effective responses is more urgent than ever.

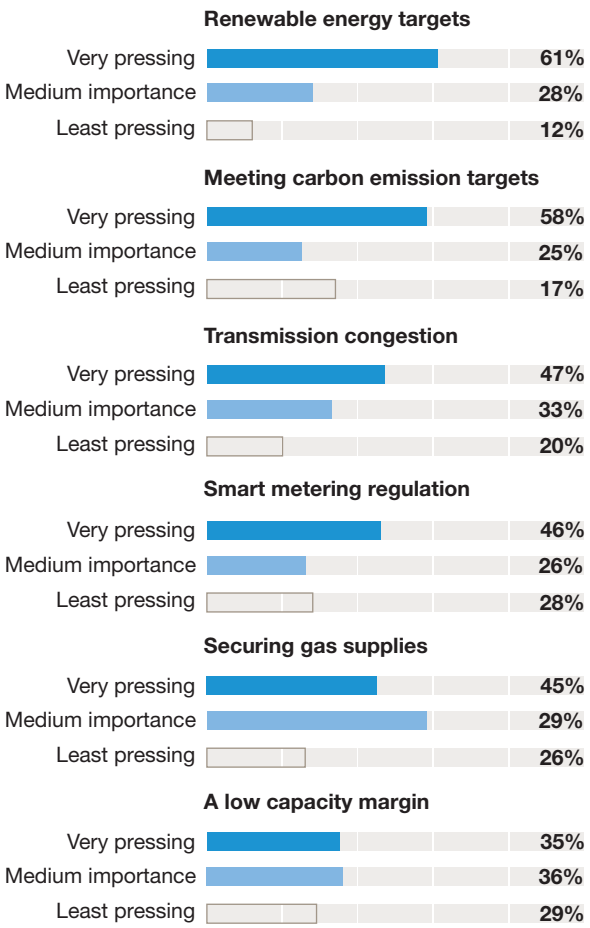
These concerns are reflected in the industry's assessment of the most important developments in their power market in the coming decade (see Figure 1) and the most pressing investment priorities (see Figure 2). The need to respond to the encouragement of renewable energy and to reduce emissions is emphasised by the majority of survey respondents. Concerns over security of supply also remain strong with over half of respondents stating that this would remain a key issue in their market in the coming decade. The transmission infrastructure challenge is reflected in its reappearance in the top six chart in 2009 after dropping out in the past few years. Significant proportions of respondents highlight the need for investment to respond to worries about transmission congestion, capacity margins and securing upstream gas supply.

Figure 1: **Top six ranking of the most important developments in your power market over the next 10 years?**



Source: PricewaterhouseCoopers, *Utilities global survey 2009*

Figure 2: **The most pressing investment drivers**

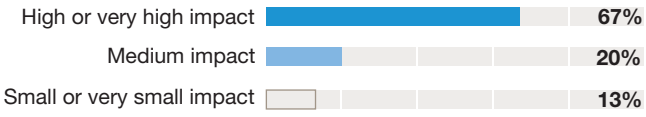


Source: PricewaterhouseCoopers, *Utilities global survey 2009*

The current economic downturn has dampened energy demand, particularly from big industrial consumers, but the long-term imperatives highlighted by respondents remain in place. One result of the current market environment has been to cast considerable doubt on whether investment will come forward in a timely manner to keep pace with future demand for power and climate change targets. Two thirds (67%) of respondents report that a shortage of capital is having a high or very high impact on their activities (see Figure 3).

Uniformly high responses were recorded to this question across all regions in the world and this is being reflected in cutback announcements. In the US, for example, almost half of the top ten utilities have announced reductions to planned 2009 capital expenditure. In such a bearish climate, utilities are more than ever mindful that the cost and availability of capital is a key risk when determining a project's financial viability.

Figure 3: **The impact of a shortage of capital for infrastructure projects**



Source: PricewaterhouseCoopers, *Utilities global survey 2009*

The cost of capital

The debt markets remain open to most utility companies but at higher cost. For example, the spreads (to benchmark curve) on utility corporate bonds issued by European utility companies in late 2008 and early 2009 increased more than twofold from 2007. Similarly, the margins on loans have risen dramatically in the last 12 months and tenors are substantially shorter than seen in recent years with 7 years now being considered long.

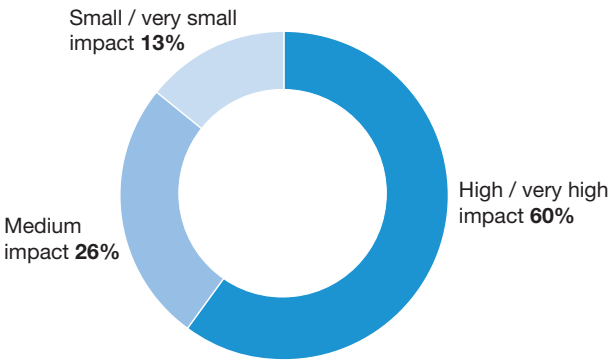
When it comes to raising funds through equity, the heightened risk perceived in capital markets has also been reflected in higher estimates for the equity market risk premium (EMRP). The cost of equity has risen for utility companies relative to previous years. In particular there has been a significant increase in financing costs for any short-term capital requirements. It is possible for utility companies to raise equity capital through rights issues, but the timing and perception of the issue can affect cost and success.

In such an environment, investments in energy efficiency and renewable energy may be lower than previously expected, investments with low upfront costs will be preferred to highly capital-intensive ones and plant retirements may be delayed. Retirements will reduce the short-term need for new capacity but reduced capital project construction levels and a slowing of renewable energy development could have a significant long-term impact when energy demand picks up.

Trading and credit risk

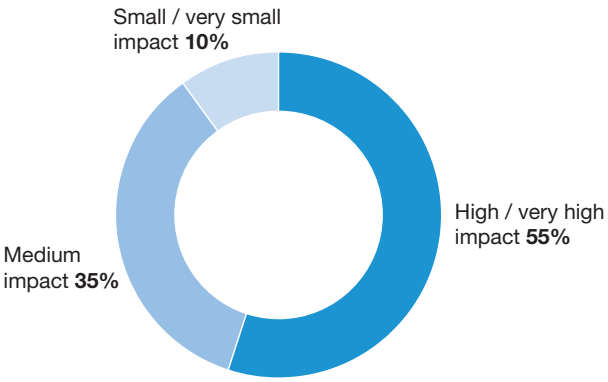
The current environment is also heightening energy trading risk. Liquidity in the market is a major concern, especially with the withdrawal from energy trading of some banks and other financial players. Eight-six per cent of respondents indicated that reduced liquidity in energy trading markets was having an impact on their companies with 60% of all respondents rating this impact as high or very high (see Figure 4).

Figure 4: **The impact of reduced liquidity in energy trading**



Source: PricewaterhouseCoopers, *Utilities global survey 2009*

Figure 5: **Increased credit risk in the sales and retail business**



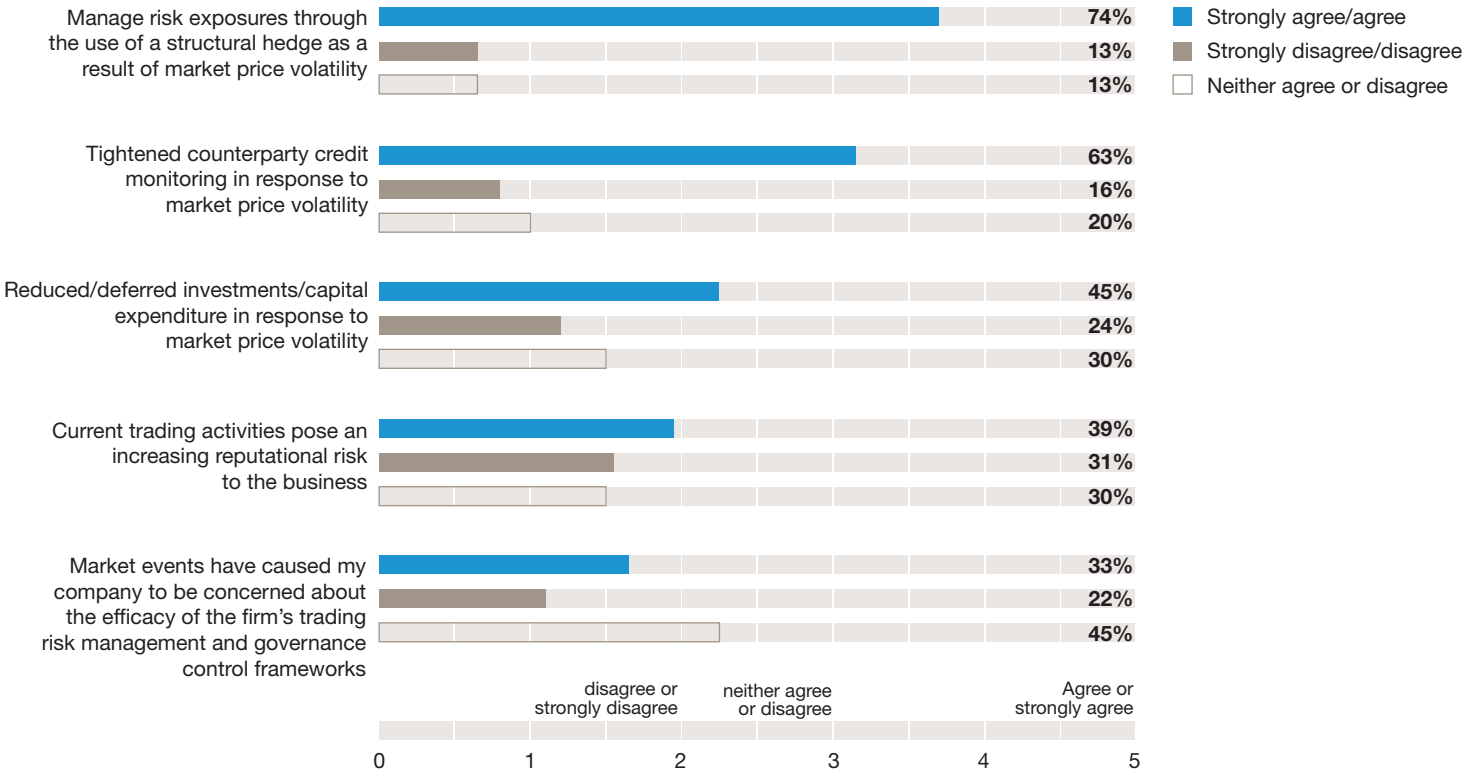
Source: PricewaterhouseCoopers, *Utilities global survey 2009*

Liquidity is especially critical because companies are increasingly dealing on a cleared exchange basis. If they are in the over-the-counter market, there are collaterals to be made. Large amounts of funds need to be available for collateral or as a variation margin. As a result, credit risk management is a very important area for companies. Customer credit risk is also identified as an area of major concern and 90% of respondents reported a high or very high impact of increased sales and retail credit risk (see Figure 5). Companies are clearly mindful of the risks of customers going into liquidation, defaulting on payments, bargaining over delivery or simply shutting down plant and requiring less supply.

Price volatility

Companies are having to manage the latest turn of events against a background of continuing energy price volatility. They are responding in a range of ways. A significant majority of respondents have taken measures to offset the impact of volatile energy prices through structural hedging and tighter counterparty monitoring (see Figure 6). Uncertainty and instability in wholesale energy markets is also having an effect in terms of reductions or delays in capital expenditure. Respondents are mindful of the potential for trading activities to cause reputational risk to their companies and, indeed, 39% see such potential increasing. However, only a third go so far as to express concern about the efficacy of their firm's trading risk management and governance control frameworks.

Figure 6: **The impact of market volatility**



Note: Rate where 4-5 = agree/strongly agree; 3 = neither agree or disagree; 1-2 = disagree/strongly disagree
Source: PricewaterhouseCoopers, *Utilities global survey 2009*

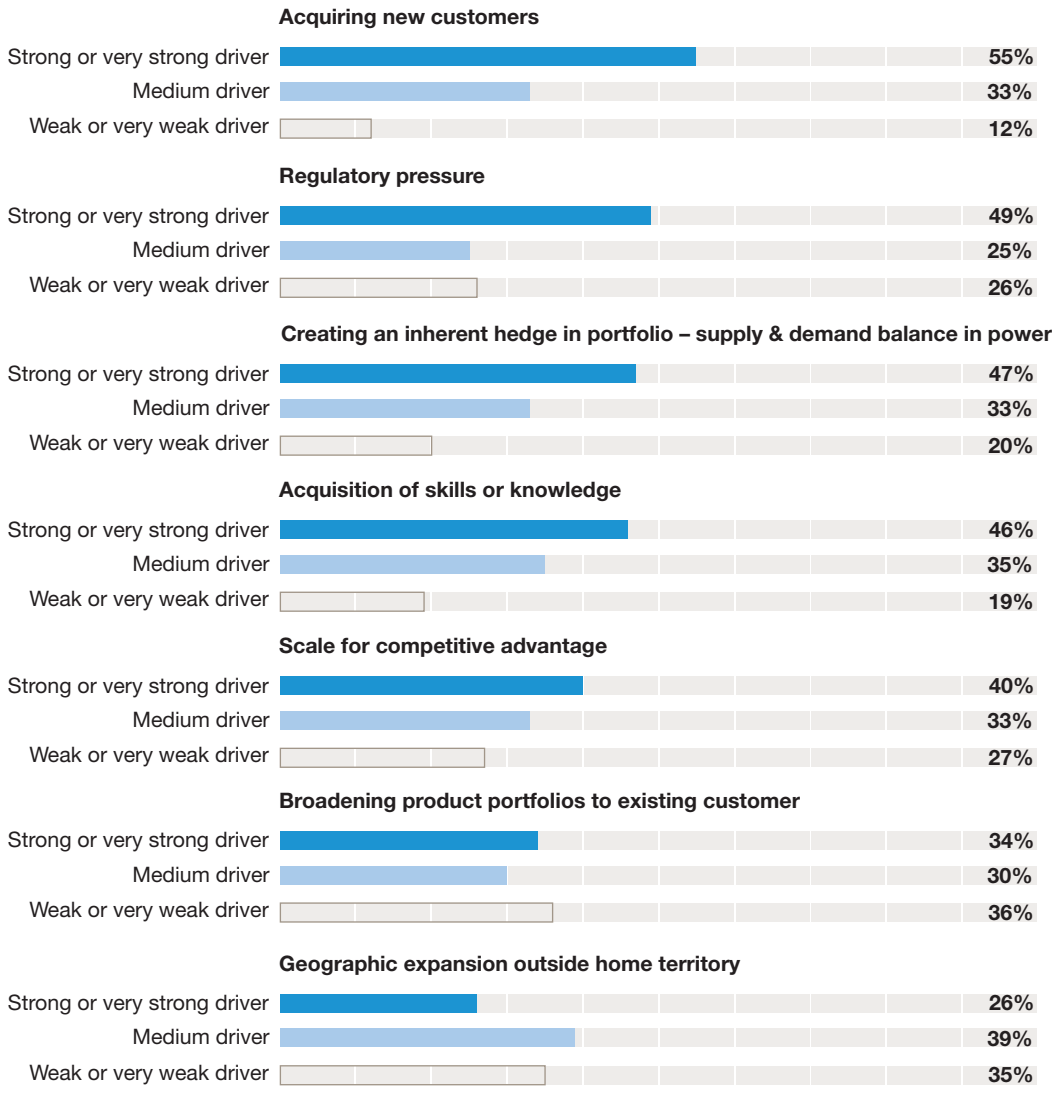
Growth

The power utilities industry has come off the back of a series of record-breaking years for mergers and acquisitions activity. Inorganic growth has been the order of the day for many companies, particularly in Europe, as companies sought to acquire scale and presence across territories. Now, many of the busiest M&A players are concentrating on bedding down their acquisitions and delivering the synergies they are seeking. The constrained availability of finance will also inhibit deal activity and, until that situation is eased, there is unlikely to be a revival in deal values.

Inorganic growth

However, some players will be less constrained than others by the financial markets. Transformational large transactions cannot be ruled out but the main activity is likely to be at lower value levels and with an emphasis on individual assets as well as corporate assets. Certainly the underlying drivers of consolidation, supply security and capitalisation remain in place and will create increasing pent-up deal demand. M&A remains a key route for acquiring new customers, securing supply and demand balance in power, the acquisition of new capabilities and delivering scale (see Figure 7).

Figure 7: **Inorganic growth: what is the driver of M&A within your business?**



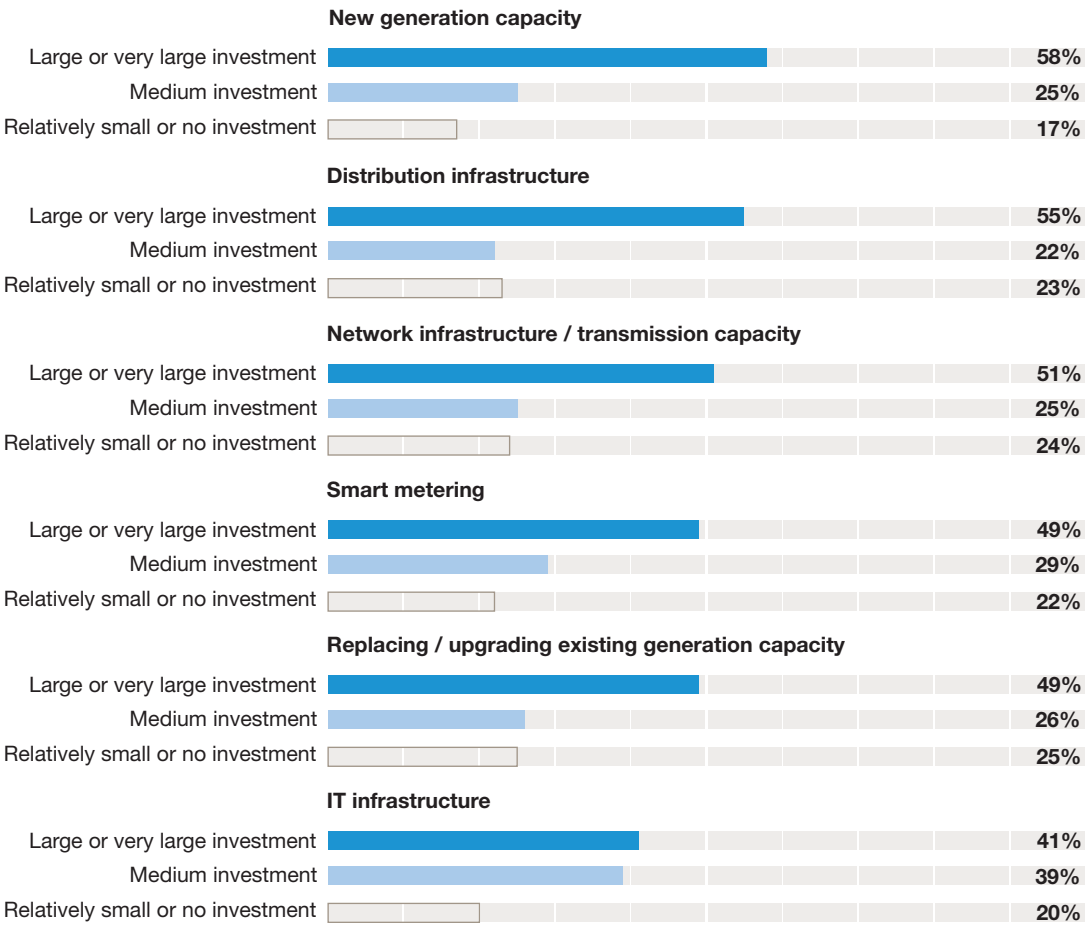
Source: PricewaterhouseCoopers, *Utilities global survey 2009*

Regulatory pressure was also identified as a strong driver for M&A, especially by European and Asia Pacific respondents. A significant proportion of companies are continuing to prioritise international expansion and, again, this is particularly the case among European and Asia Pacific respondents. A quarter of all respondents reported that growth outside home territories was a strong or very strong M&A driver. This rose to a third in the case of European respondents and slightly more still for those in Asia Pacific.

Organic growth

In a constrained M&A environment, organic growth assumes even more importance. The development of new generation capacity and the renewal of existing generation plant is a priority area for most companies with over half reporting that they are seeking major investment in generation (see Figure 8). Investment in transmission and distribution is a similarly pressing issue with many companies seeking to make large investments in network infrastructure. Companies are also placing a strong emphasis on more effective IT infrastructure and the introduction of smart metering. These results were fairly uniform across different parts of the world although IT was given less emphasis by European respondents. Only 23% of European respondents are looking to make major IT investment, perhaps a reflection that European market liberalisation has already spurred investment in more sophisticated platforms.

Figure 8: **Organic growth: where are you looking to make new investments?**



Source: PricewaterhouseCoopers, *Utilities global survey 2009*

Upstream supply

Securing upstream supply, particularly of gas, remains essential for most utility companies and our survey shows a progressive ramping-up over recent years of procurement strategies and moves to secure access to resources. More companies are placing long-term contracts or sourcing supply from new regions in order to secure their energy supply; 70% and 55% of respondents respectively cited these two moves compared with only 49% and 26% just two years ago (see Figure 6). There is also a notable increase in the proportion of respondents reconsidering their fuel mix in both new and existing plants.

The UK is an example of the trend to establish long-term contracts from foreign sources to replace a declining North Sea gas supply. UK utility companies have put in place long-term contracts for gas – from Statoil in Norway (through the Langeled pipeline); from Gazprom in Russia piped through Europe and the Bacton-Zeebrugge interconnector; and for LNG shipments from sources such as Qatar. The latter has necessitated considerable investment in LNG offload, regasification and pipeline infrastructure. The BG Group has embarked on a major international acquisition spree to gain access to Australian coal methane gas for LNG shipping to international markets in Asia Pacific and further afield.

Figure 9: **How are you responding to upstream fuel challenges now and in the next 5 years?**

	2007	2008	**2009**
Improve your company procurement	39%	64%	**77%**
Secure current fuel mix by entering into long-term contracts	49%	54%	**70%**
Secure current fuel mix by sourcing fuel from new regions	26%	38%	**55%**
Change fuel mix in new & planned plants	29%	38%	**55%**
Upstream integration via direct investments	33%	51%	**52%**
Upstream integration via joint venture or alliance	27%	53%	**46%**
Change fuel mix in existing plants	27%	28%	**39%**
Upstream integration via acquisitions	16%	37%	**35%**

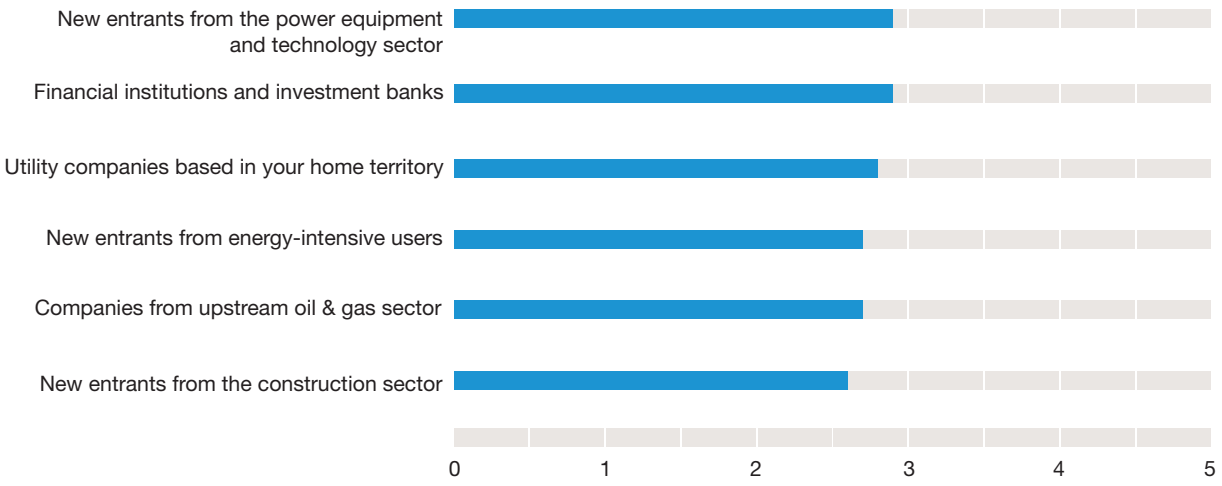
Source: PricewaterhouseCoopers, *Utilities global survey 2009*

Technology-driven competition and growth

Technology will be key to future growth and competitive advantage. The importance of technology for key developments, such as energy efficiency and the expansion of nuclear power, has led many survey respondents to pinpoint power equipment and technology companies as a more significant competitive threat than even direct competition in the retail market by other utility company home market rivals. Only 14% of survey respondents viewed equipment and technology companies as no threat and 35% identified them as a strong or very strong threat.

'New entrant' technologies, being invested in by companies with strong balance sheets, are a threat to companies with older and less efficient coal and gas generation. Among the important technologies currently being introduced, for example, are very efficient combined cycle gas turbines (CCGTs) that have a thermal efficiency of well over 50%. Super-critical coal technology uses high pressures and high temperatures to achieve thermal efficiency of above 40% region (compared to mid-30s for most existing coal fired generation). These are cleaner, as well as more efficient, power generation technologies. Early CCGTs sometimes had an efficiency of only 40% with limits on their flexibility. Looking ahead, the potential for stand-alone or distributed local off-grid generation may also provide opportunities for power equipment and technology companies to play a more visible role with end-customers in the future power landscape.

Figure 10: **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?**



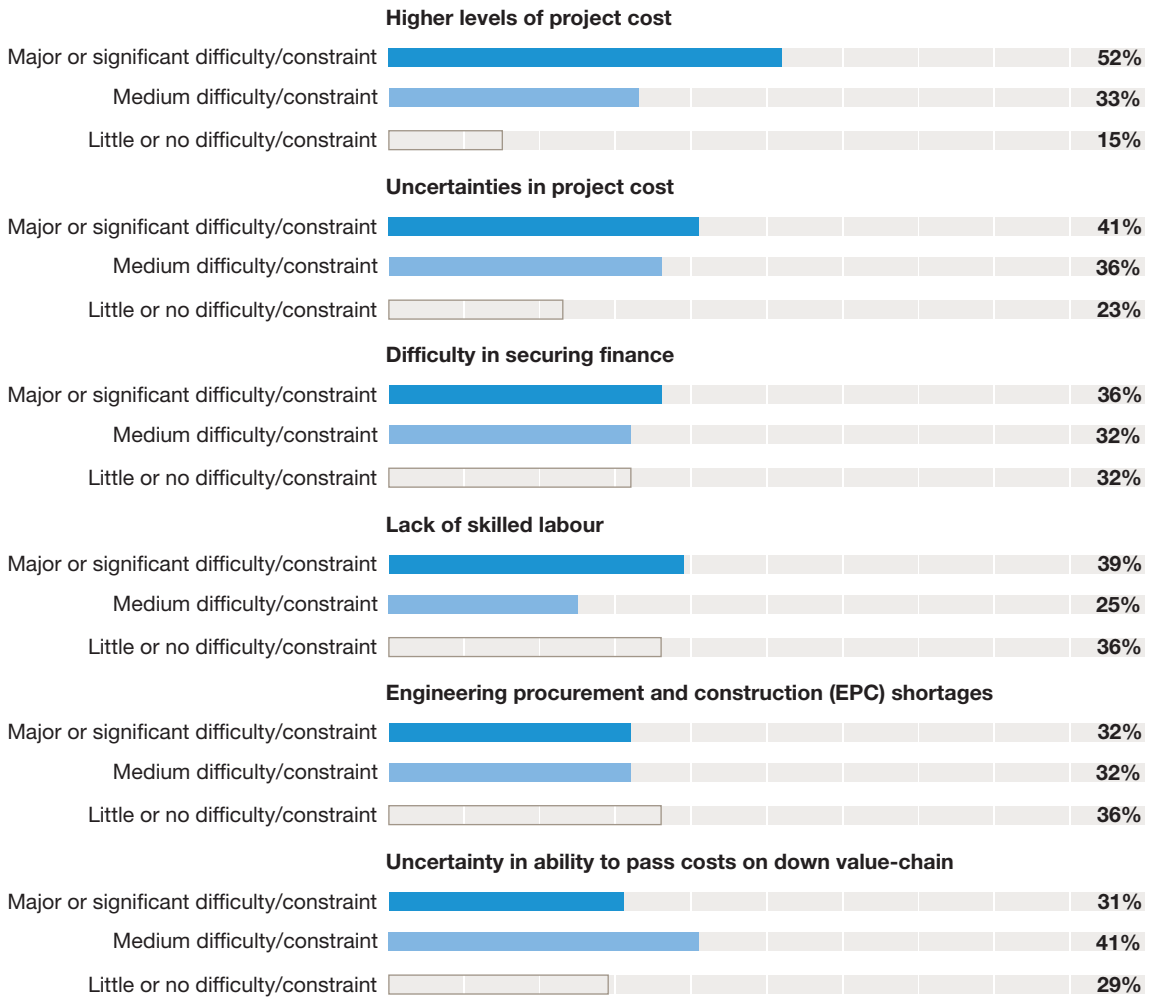
Note: Rate where 5 = greatest threat; 1 = no threat
Source: PricewaterhouseCoopers, *Utilities global survey 2009*

Barriers to growth

The importance of capital projects is reflected in the challenges that companies identify in delivering their growth strategy. Respondents are worried about the high costs and high levels of cost uncertainty associated with projects. Over a third cite problems in securing finance as a major barrier to growth. Skill shortages and access to good procurement capability also continue to pose challenges for many companies.

The downturn may ease some of these constraints but finance could continue to be a problem for many projects, particularly in the renewable energy field where uncertainties about market competiveness are clouding many investments. Falling carbon prices have exacerbated the difficulties faced by renewable energy projects. Sector-wide, companies are expected to adjust their strategies by reducing costs and evaluating risks versus returns on new and existing projects. Postponement or cancellation, however, can increase costs and leave companies exposed to market share losses in an upturn.

Figure 11: **What difficulties/constraints do you anticipate in realising your growth strategy?**



Source: PricewaterhouseCoopers, *Utilities global survey 2009*

Regulation

From market structure and rules, pricing and competition requirements through to emissions frameworks and the encouragement of renewable energy, regulation plays a vital role at the heart of the utilities sector. As we saw in Figure 1, 84% of respondents to our survey expect regulation to play an increasing role in the next 10 years and two-thirds of the 84% say it will have a large or very large impact on their market.

Market change

Regulation is already making itself more strongly felt. For example, structural change within energy markets is a key regulatory challenge faced by major utilities today. Initiatives such as the Energy Third Package in Europe have been designed to facilitate a more transparent and competitive landscape. This is raising issues such as asset unbundling and cost reduction. In Europe, the past 12 months have seen anti-trust investigations and court rulings on power market competition and market access. The exact shape of European market reform will not be clear until summer 2009 and there are signs of compromise on network unbundling (see Europe section). In the UK, the energy regulator Ofgem is seeking new powers to investigate and fine electricity companies for market abuse amid concerns that generators are exploiting weaknesses in the system to push up prices.

In turn, we see utility companies stepping up their responses to regulatory change. Ninety three per cent of survey respondents said their company was implementing operational measures to respond to regulatory moves – up sharply from 76% of respondents two years ago (see Figure 12). A significant proportion of respondents are also repositioning within the value chain (43%) or by country (41%) – again up from just two years ago. In some cases, such as Eon's earlier proposed sale of its networks, companies are seeking to be proactive in anticipation of regulatory moves. Repositioning, while most evident in Europe with 83% of respondents saying their company is repositioning by country and 50% within the value chain, is not confined to that continent. Half of Asia Pacific respondents and a third of American respondents report that their company is repositioning along the value chain in response to regulatory initiatives.

Attitudes towards the regulator

Despite the challenges that can come from regulation, most survey respondents are appreciative of the regulatory role and many more disagreed than agreed with a set of statements critical of regulation. Only 32%, for example, felt that their market had an 'unclear or non-transparent regulatory process' and only 30% complained that there tended to be 'frequent changes to regulatory decisions and outcomes'. These minority criticisms were slightly more felt by respondents in countries in Asia Pacific, the Middle East and Africa.

The less mature evolution of regulation in some of these countries was also reflected in a greater lack of support for regulation and lack of personnel with experience of regulation within utility companies. For example, 44% of Middle East and African respondents felt that they lacked an experienced regulatory resource in their company compared with only 14% of American respondents. The stepping up of regulatory initiatives in Europe also appeared to be causing concern among European respondents about their companies' regulatory capacity – as many (41%) felt they lacked resource as felt their internal set-up was adequate.

Figure 12: **How are you responding to regulatory challenges?**

	2007	2008	**2009**
Operational initiatives to respond to regulatory framework & execution (e g unbundling, cost cutting, performance improvement etc)	76%	81%	**93%**
Industry-wide initiatives, aiming to improve regulatory framework & execution	76%	75%	**81%**
Reposition in the value chain, ie reducing or increasing presence in individual countries, following regulatory terms & conditions	32%	28%	**43%**
Reposition by country, ie reducing or increasing presence in individual countries, following regulatory terms & conditions	31%	38%	**41%**

Source: PricewaterhouseCoopers, *Utilities global survey 2009*

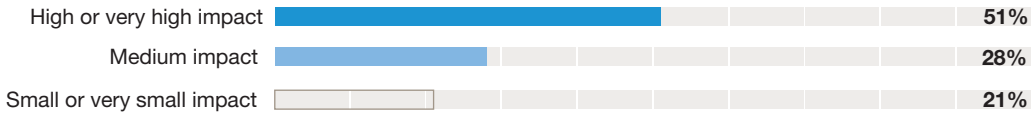
Climate change

2009 will be a watershed year for climate change regulation. Falling energy and carbon prices are casting doubt on the viability of some renewable energy schemes and the economic downturn is testing commitment to climate change mitigation. Governments have a chance to set a more certain framework for the industry. The first year of the Obama presidency, the direction of travel in the run-up to the December 2009 UN Climate Summit in Copenhagen and the outcome of those talks will all have a vital bearing on the outlook for the power utilities industry. The political will of heads of government for a new climate treaty and the extent of their ambition for clean energy will set the context for the sector for many years.

Whether governments have the political will to drive through measures to combat climate change is in some doubt in the minds of our survey respondents. Asked if the economic recession would slow down responses to climate change, 51% felt that it would have a high or very high impact on a likely slowing of responses and 28% felt that it would have a medium impact (see Figure 13). Only 21% thought it unlikely that the recession would slow climate change responses.

We also tested respondent views about the political will behind climate change action by asking whether high energy prices would deter governments from increasing utility company environmental obligations. More respondents (40%) felt that high energy prices would dilute environmentalism than disagreed with this view (30%). The remainder were undecided. Respondents from Asia Pacific, Middle East and African countries were most likely to see a direct trade-off between energy prices and environmentalism – 50% of Asia Pacific respondents and 54% of Middle East and African respondents believe that higher prices would soften policy requirements.

Figure 13: **Will the economic downturn slow down responses to climate change?**



Source: PricewaterhouseCoopers, *Utilities global survey 2009*

A watershed year for climate change policy

Call for clarity

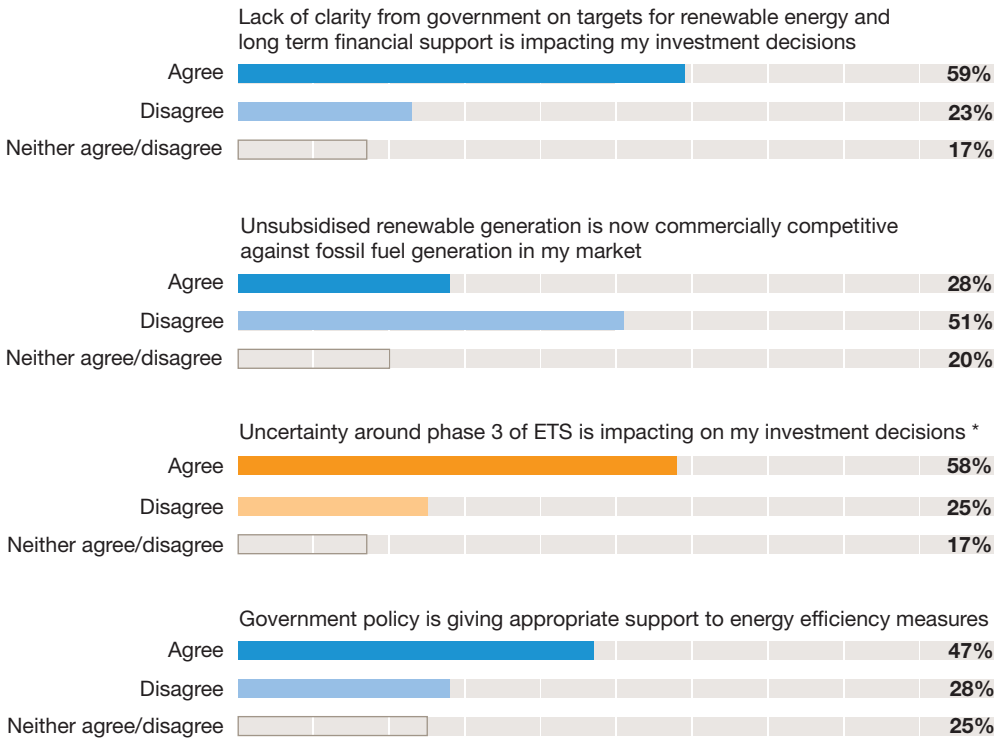
The importance of governments delivering greater clarity and developing an effective framework for the development of cleaner energy is highlighted by survey responses to a series of statements about renewable energy and cleaner energy investment decisions (see Figure 14). Nearly three-fifths of respondents (59%) feel that their renewable energy investment programmes are being affected by the lack of clarity from governments on renewable energy targets and financial support for renewable energy. There were, however, strong regional variations in responses with European respondents much happier with the renewables policy framework.

The EU has committed to a 20% target of renewable energy by 2020. Negotiations are taking place to translate that overall target into individual country targets. Such negotiations will prove the testing ground for how far the EU target can be realised.

The Obama administration in the US has placed considerable emphasis on building 'clean energy' measures into its economic stimulus package. The Obama-Biden New Energy for America plan has pledged US$150bn over 10 years to such measures and aims to produce 10 per cent of the country's electricity from renewable sources by 2012, and 25 per cent by 2025. The plan was announced in late January 2009, part-way through our survey interviews, and may go some way towards assuaging the 60% of American survey respondents who felt that lack of clarity was affecting their investment decisions.

The more patchy approach to renewables targets in Asia Pacific, the Middle East and Africa, is reflected in larger majorities of survey respondents in these regions stating that lack of policy clarity is holding them back. However, even in Europe, there is a need for greater certainty given the long-term timescales for investment. For example, 58% of European respondents report that uncertainty over the shape of phase 3 of the EU emissions trading scheme post-2012 is hampering their investment decisions.

Figure 14: **Do you agree with the need for environmental regulatory clarity?**



Note: *European respondents only
Source: PricewaterhouseCoopers, *Utilities global survey 2009*

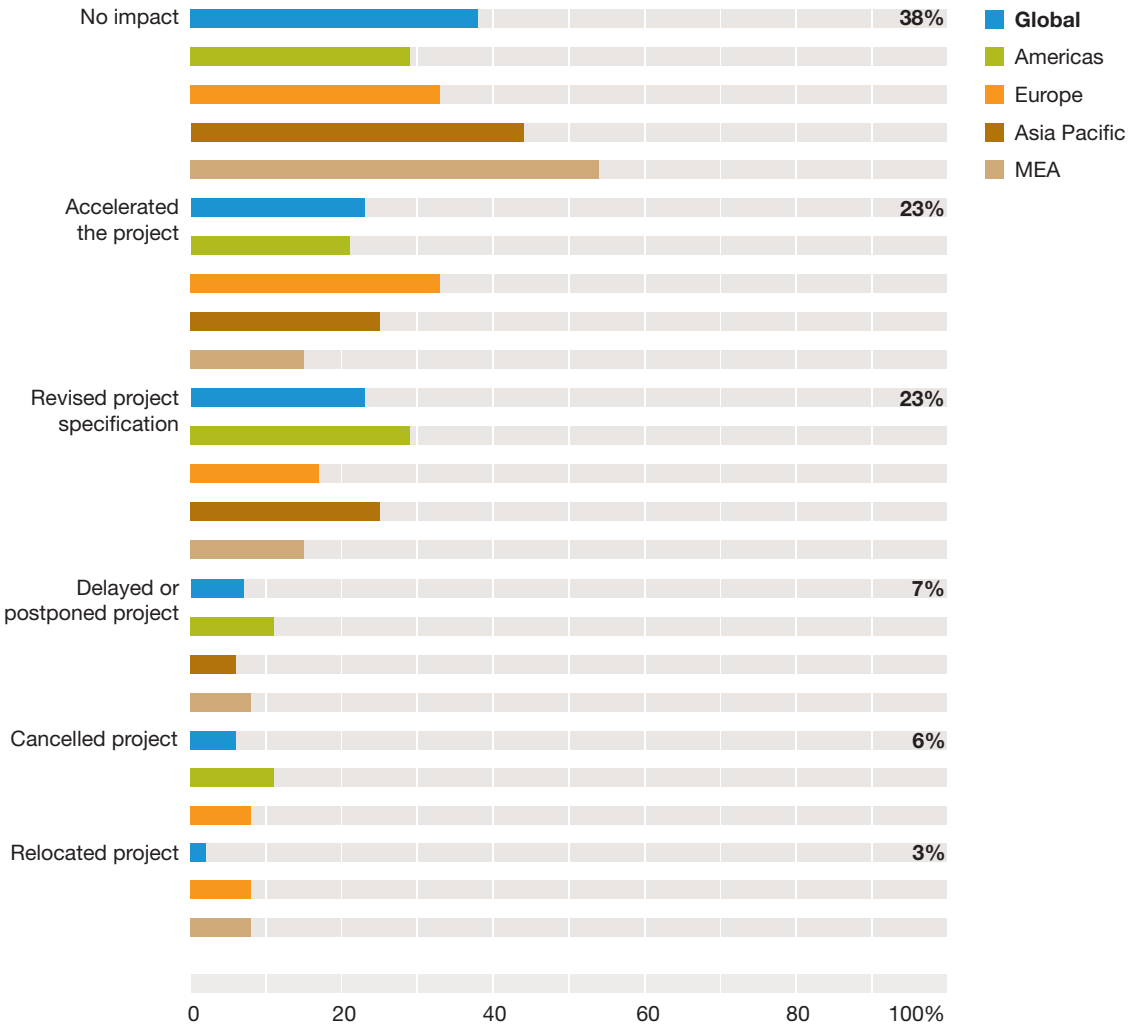
The importance of greater certainty on both targets and economic mechanisms to support renewable energy is highlighted by the fact that, even coming off the back of a period of record high power prices, only 28% of respondents believe that unsubsidised renewable power can compete commercially against fossil fuel generation. American respondents are especially likely to see renewable power as uncompetitive – only 11% felt it could currently compete without subsidy.

Moreover, the current financial crisis and constraints on capital investment are exerting significant pressure on investment in renewable energy. Investments in wind, solar, and other evolving technologies have been among the first to be cut. Alone out of the regions, respondents in Asia Pacific were more optimistic about the ability of renewable power to hold its own in the marketplace.

Impact of climate change regulation

Utility executives in our survey also highlight the need for more effective specific policy mechanisms to restrict greenhouse gas emissions (GHG). Even in Europe, where the EU emissions trading scheme has been in operation since 2005, a third of respondents felt that GHG regulations had had no impact on their capital project investment decisions (see Figure 15), although the impact of emissions trading was more tangible in European responses to a separate question on the scheme (see Europe section). Around half of the respondents from Asia Pacific, the Middle East and Africa reported that such regulation had no impact on them. Everywhere, few respondents said that GHG regulation had caused the cancellation of projects.

Figure 15: **How have existing and proposed GHG regulations and the carbon price affected major capital project investment decisions to date?**



Source: PricewaterhouseCoopers, *Utilities global survey 2009*

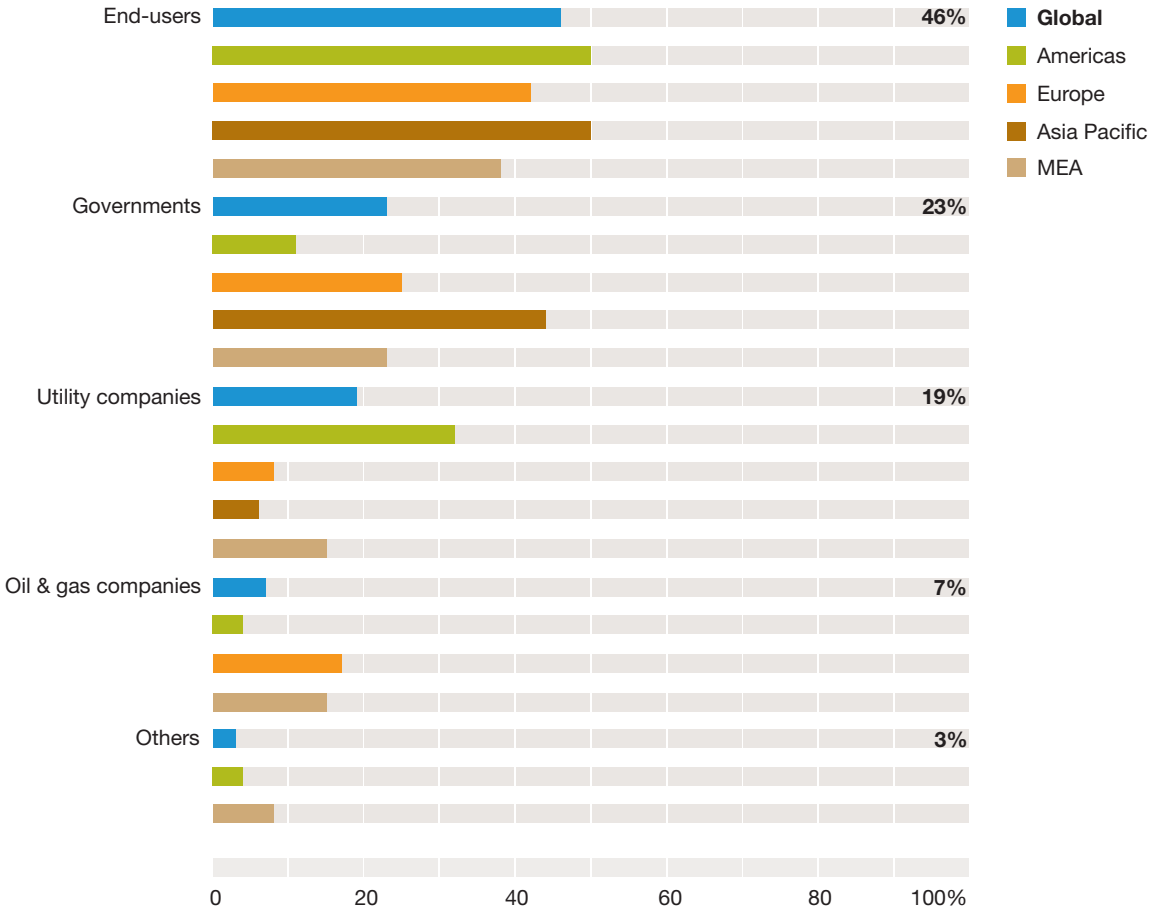
Energy savings and efficiency

As the responses in Figure 14 show, utility company survey respondents are less critical of regulatory support for energy efficiency measures than on other regulatory matters, with only 28% of all respondents disagreeing with the proposition that government policy is giving appropriate support. Again there are strong regional differences. European and American respondents are much more likely to feel that energy efficiency support has not been developed sufficiently.

Energy efficiency is a critically important element in the energy equation. Energy saved through efficiency is the only source of 'free' energy that is available. However, if significant reductions in per capita energy use are to occur, huge technological advancements will be required. As we develop more and better technologies, these efficiencies will enable us to maximise precious energy resources, meet long-term energy challenges, and revolutionise energy usage in transportation and in industry.

But who is to take the lead? Despite continuing initiatives, there is the danger that energy saving is something that falls between different stools and, indeed, only really comes to the fore when prices are high. Our survey indicates the danger that this will continue to be the case. There is an increasing belief among respondents that it is not for governments to take the lead (see Figure 16). In contrast to last year's survey, when 59% of all respondents felt that governments should take the lead, only 23% were of this viewpoint in 2009. Instead, 46% felt the lead needed to come from the end-users who would benefit from efficiency savings. However, unless prices are high, it has to be questioned just how effective such an approach will be.

Figure 16: **Who should take the lead in achieving energy savings and efficiency?**

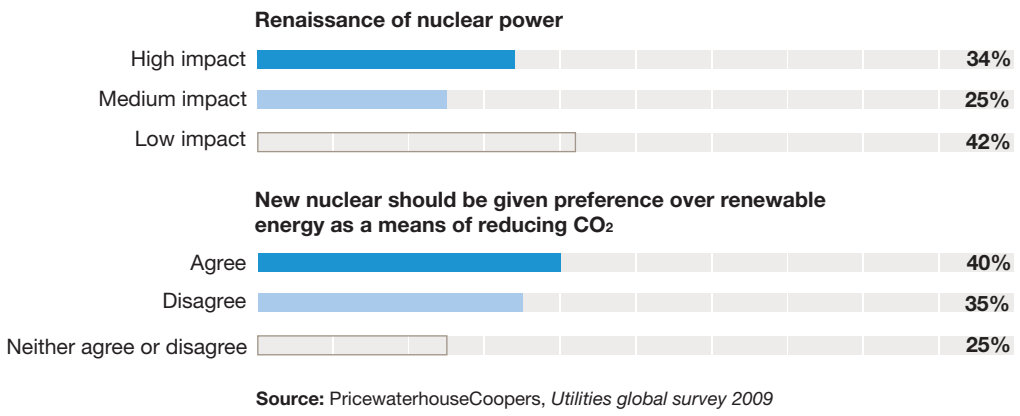


Source: PricewaterhouseCoopers, *Utilities global survey 2009*

Nuclear power expansion

Nuclear power is undergoing a renaissance as more governments change their policy stance on new nuclear expansion. In February 2009, for example, Sweden announced it will allow the construction of nuclear power stations, ending a ban imposed after a 1980 referendum. Italy looks set to follow suit and the UK has already announced a programme of growth in its nuclear plant. This revival of nuclear power is reflected in 59% of respondents worldwide anticipating that nuclear power would have a significant impact in their market (see Figure 17). More than half of these felt that it will have a high or very high impact. Indeed, some respondents go further and believe that nuclear power should be given preference over renewable energy in reducing CO_2 emissions although their views are nearly balanced by those who would prioritise renewable over nuclear power.

Figure 17: **Nuclear maintains momentum**



Source: PricewaterhouseCoopers, *Utilities global survey 2009*

Nuclear power set to make a significant impact

Operations

Our survey focused on three critical operational areas for utility companies – delivering technological improvements, limiting the growth of greenhouse gases and achieving improvements in operational and environmental performance. Effective responses on these challenges will be vital for many aspects of individual company success, requiring innovation from power utility companies.

A focus on technology

Where will technological developments have most impact in the coming years? As Figure 18 shows, with regard to generation and supply, respondents see technology having a high but steady impact in areas such as wind and nuclear power. However, growing scores for energy efficiency, solar power, combined heat and power, distributed generation and combustible renewable and waste generation indicate that these are seen as the likely areas where technology will have the most new impact. All these developments will increase the likelihood of technology-driven competition highlighted earlier in Figure 7.

Figure 18: **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?**

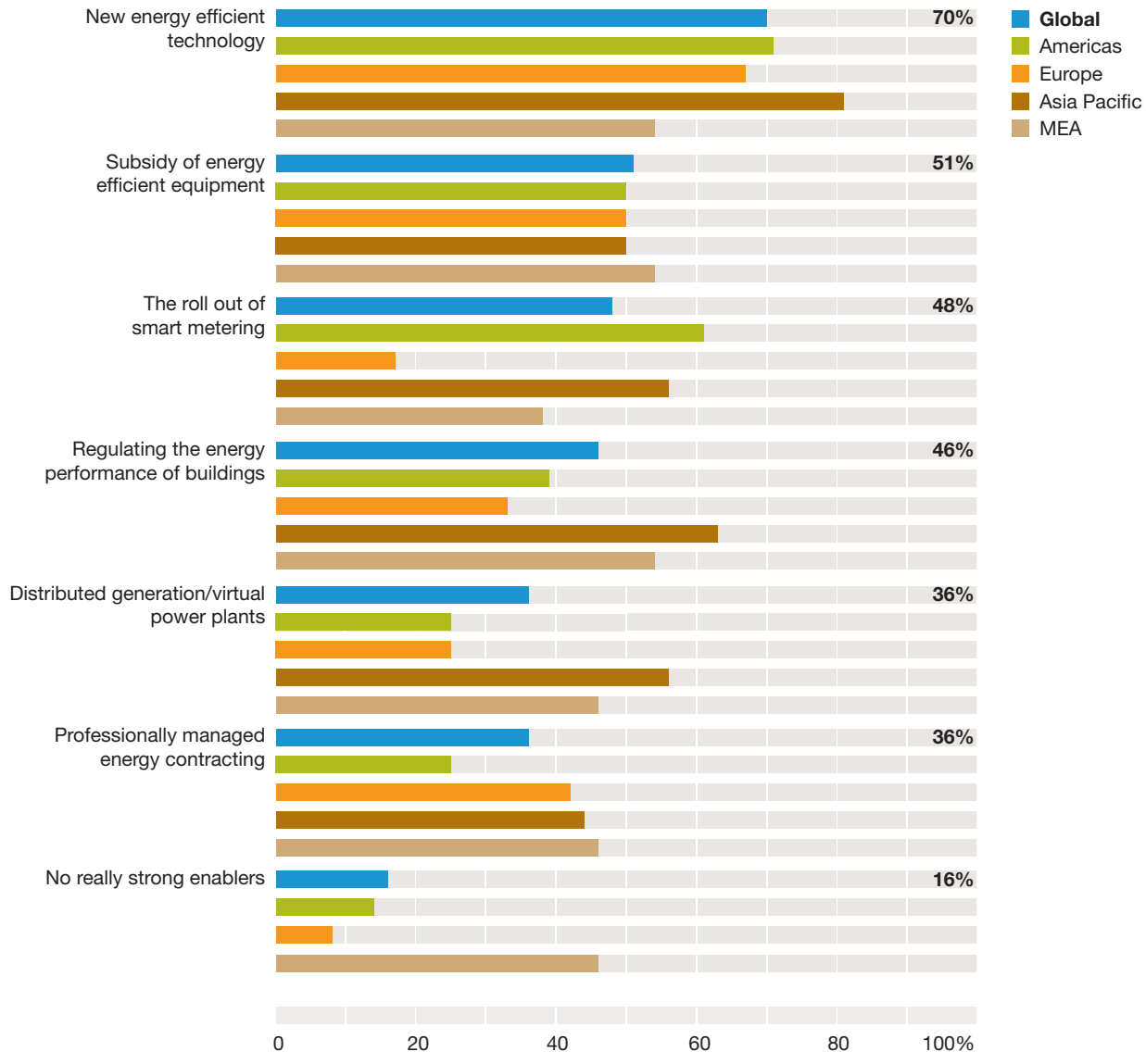
	2007	2008	2009
Energy savings and efficiency	62%	79%	**81%**
Wind power plants	66%	62%	**68%**
Gas-fired plants	45%	69%	**67%**
Solar power plants	29%	54%	**62%**
Combined heat and power (CHP) plants	33%	52%	**61%**
Distributed generation	38%	49%	**59%**
Coal-fired plants	45%	49%	**57%**
Nuclear power plants	56%	57%	**54%**
Combustible renewable	33%	47%	**54%**
Waste incineration and landfill gas	26%	41%	**51%**
Micro-generation	-	-	**45%**
Geothermal	24%	40%	**39%**
Hydro power plants	31%	36%	**36%**
Oil-fired plants	11%	20%	**35%**

Source: PricewaterhouseCoopers, *Utilities global survey 2009*

The introduction of new energy efficient technology energy is seen as a key enabler to major improvements in energy efficiency (see Figure 19). Subsidy of energy efficiency equipment is also seen as important. The Obama-Biden New Energy for America plan includes a US$1bn per annum federal grant programme "to identify and support local manufacturers with the most compelling plans for modernizing existing or closed manufacturing facilities to produce new advanced clean technologies". However, unless prioritised by governments as part of stimulus programmes, the potential for substantial subsidy schemes is likely to be restricted because of the pressures on the public spending in many countries as a result of the cost of the various bail out and stimulus measures.

Smart metering, which helps individual users to better monitor and control the way they use energy, is viewed as playing a key role by American and Asia Pacific respondents although, in Europe, despite the EU mandating an 80% roll-out of smart metering by 2020, only a minority of respondents saw it as important. European utilities appear sceptical about the ability of smart metering to deliver major improvements in energy efficiency. Smart metering in Europe is mainly predicated on other gains such as firm monthly bills, back and front office cost savings and improvements in outage management. In contrast, smart metering in North America and many Asia Pacific countries offers greater 'demand response' advantages due to the very high summer air conditioning loads. Other measures that were identified as playing a role in delivering efficiency gains included regulation of the energy performance of buildings and distributed generation. By placing power generation close to the end user, distributed generation could play a part in reducing energy lost in transmission and distribution systems.

Figure 19: **What are the key enablers for major energy efficiency improvements in your market?**



Source: PricewaterhouseCoopers, *Utilities global survey 2009*

Limiting the growth of greenhouse gases

Expansion of renewable power sources and nuclear energy remain the principal routes by which respondents to our survey anticipate that GHG growth will be contained in future decades (see Figure 20). Despite its potential importance in the generation mix, carbon capture and storage (CCS) of emissions from coal-fired generation comes lower down the list of expected technological impacts over the next ten years. In the short-term, respondents are right to be cautious as, although the technology is available, it is expensive and is yet to be applied to large-scale power plants. Current pilot demonstration projects are still a few years away. Reference scenarios modelled by the IEA assume commercialisation will not come until around 2020 (*World Energy Outlook 2008*, International Energy Agency).

However, it is anticipated that CCS will have a significant long-term impact. Even in its less ambitious 550ppm policy scenario of stabilising GHGs, the IEA assumes that CCS will feature in 101GW of the 323GW of additional coal generation capacity coming onstream between 2021 and 2030, including 70% of additional capacity in OECD+ countries. Thus, survey respondents' expectation that the coal carbon capture and storage picture in 2050 will be little different from 2018 seems pessimistic and, indeed, slightly alarming given the continuing importance of coal in the generation mix. The IEA's reference scenario projects coal-fired generation to grow at two percent per annum to 2030, maintaining a 47% share of the power generation fuel mix. In the 550ppm policy scenario there is a substantial reduction in the growth of coal-fired generation but, even in this scenario, it would still play a major role and, indeed, is projected to be 26% higher by 2030 compared to current levels.

Figure 20: **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?**

	Over the next 10 years			By 2050		
	2007	2008	**2009**	2007	2008	**2009**
Renewable power generation	47%	50%	**54%**	43%	54%	**54%**
Nuclear	43%	53%	**45%**	59%	58%	**54%**
Energy efficiency improvements	42%	42%	**48%**	38%	35%	**46%**
Displacement of new and existing coal fired capacity with gas-fired generation	–	18%	**16%**	–	14%	**7%**
Coal-fired generation with carbon capture & long-term geologic storage	–	25%	**20%**	–	26%	**26%**
Gas-fired generation with carbon capture & long-term geologic storage	–	13%	**17%**	–	13%	**13%**
Carbon capture and storage	26%	–	–	26%	–	–
Coal gasification	19%	–	–	21%	–	–
Gas-fired generation	22%	–	–	14%	–	–

Source: PricewaterhouseCoopers, *Utilities global survey 2009*

Operational and environmental performance

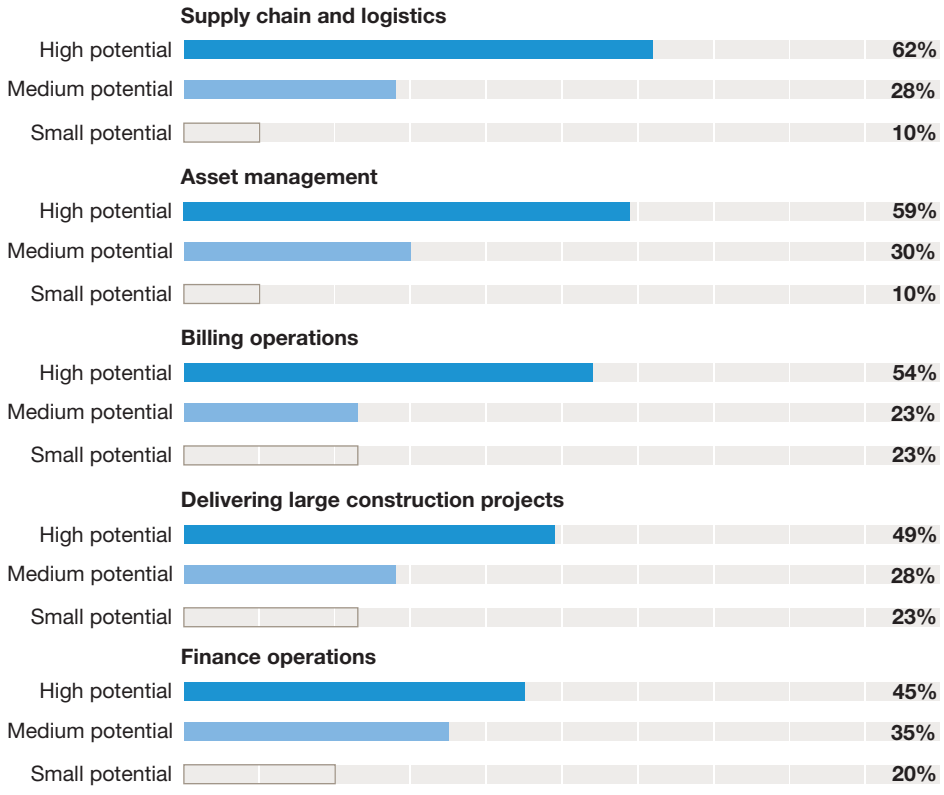
Reduced demand for power in the economic downturn reinforces the importance of utility companies maximising their operational performance. Our survey identified a range of opportunities for performance improvement (see Figure 21). Better management of the supply chain, utilisation of assets, billing operations and the delivery of large capital projects were seen as areas where high or very high performance improvement could be achieved. Indeed, at least half of survey respondents thought the scope for improvement was high or very high in these areas. Relatively few felt there was little scope for performance gains. Supply chain management stood out with 62% identifying a high or very high potential for performance improvement and only 10% seeing little potential.

A company's environmental performance is becoming increasingly important from an investment point of view, particularly where carbon trading or other regulatory mechanisms impact investment feasibility and market performance. The senior utility company executives we interviewed reported that communicating their environmental performance was aiding their investor relations (see Figure 22). Seventy per cent reported a positive impact, up from 57% last year, with very few reporting a negative impact.

People

Having the right people skills in place and using these flexibly is critical to sustaining business strategy and responding to market changes, especially as companies face tougher market conditions. Utility companies have diverse workforces, often working remotely and geographically dispersed. While the economic downturn has helped to push the people factor slightly lower down the boardroom agenda, the issue of a limited supply of candidates with the right skills remains a major challenge. In the long-term, companies are worried about declining enrolment in university courses for the sciences and technologies, and expect difficulties in recruiting and integrating younger employees.

Figure 21: **The scope for operational improvements**

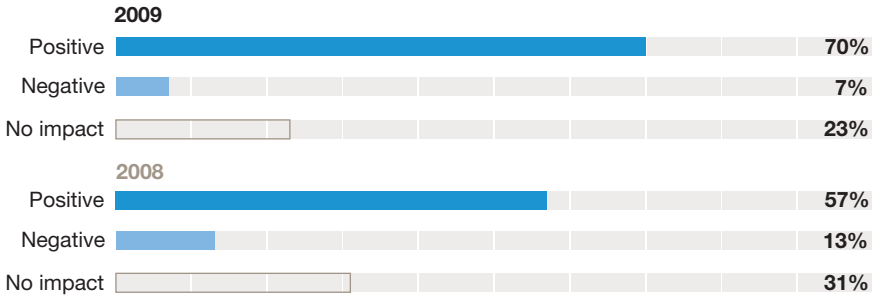


Source: PricewaterhouseCoopers, *Utilities global survey 2009*

Our survey confirmed continuing skills shortage concerns among utility companies, particularly in the field of capital project management and technical expertise in the growth areas of renewable power and nuclear energy (see Figure 23). Concern about lack of capital project management expertise was particularly expressed by American respondents, reflecting the relative lack of infrastructure investment in recent years and the need to ramp up such investment in the period ahead. In Europe, in contrast, anxiety about nuclear expertise stood out, again reflecting the need to expand nuclear generation after a period in which nuclear power was largely off the development agenda.

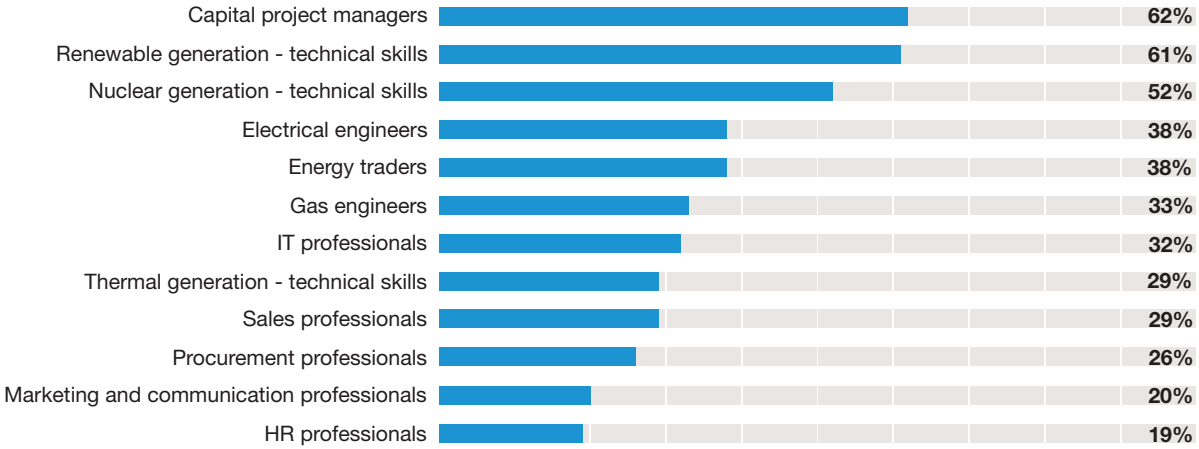
Companies are deploying a range of strategies to respond to these concerns. In order to meet immediate needs, 70% of respondents said their companies were outsourcing specific operations to specialists. A minority (41%) were also looking to the international labour market and importing talent from abroad. Looking to the longer term, 77% of respondents reported that their companies are stepping up close co-operation with universities and academic institutions on course content and 54% were developing and running their own academies. In-house academies were particularly favoured by Asia Pacific respondents with 69% saying that they are taking this route.

Figure 22: **What has been the impact of your environmental strategy & performance on your investors?**



Source: PricewaterhouseCoopers, *Utilities global survey 2009*

Figure 23: **In which sectors do you have a skills shortage?**



Source: PricewaterhouseCoopers, *Utilities global survey 2009*

With survey respondents putting so much emphasis on the need to balance short-term reaction to the financial crisis and economic downturn with a long-term focus on a world beyond recession, we decided to hear the viewpoint of chief executives and top leaders from power utility companies in North America, Europe and Asia.

Dr. Jürgen Großmann is president and CEO of RWE AG, one of Europe's leading energy companies. Reflecting on the changes of the past year, he says: "No one could have suspected that we were about to face the biggest financial crisis in the post-war era. Its extent and consequences still cannot be predicted entirely." He points out that one impact of the events of the past year has been that many people "now question the entire (banking) system and are second guessing the fundamental principles of the market economy. State intervention in the economy has become the order of the day. Could we have imagined this a year ago? Certainly not."

The need to look ahead decades not years

Among the short-term impacts Dr. Großmann observes that "industrial energy consumption is on the decline, and customers are experiencing difficulty in making payments. Financing costs are on the rise and politicians are increasingly inclined to regulate functioning market processes more intensely." However, notwithstanding these factors, and the profound nature of the changes wrought by the financial and economic crisis, RWE emphasises the importance of maintaining a long term perspective: "We should think in terms of decades, not years. This is why, in addition to the demands currently placed on us, we always keep a watchful eye on the fundamental challenges facing the energy industry that have lasting effects. Major investments must be made in Europe's energy infrastructure, especially in new generation capacity, electricity and gas grids, and gas storage facilities."

Bob Elton, president & CEO of Canada's BC Hydro, the third largest electric utility in Canada, emphasises that power utility companies are used to facing short-term situations that are different from the long-term outlook. The important thing is maintaining focus on the long-term while optimising, and indeed looking for opportunities, in the short-term. "The key objective of any leader must be to be clear about where you intend to be when the recession is over. You do have to adjust the pace a bit but the important thing is to make sure that you're facing in the right direction when it is over and it doesn't have an impact on your long term course," says Elton.

Like RWE, BC Hydro has experienced reductions in demand for power. "There are pluses and minuses," Bob Elton points out. "It can give you more time and reduce risks. For example, there are opportunities to step up maintenance programmes and other capital asset improvements. It gives us a chance to drive down costs, particularly on the capital side, to take advantage of the market being a bit softer." Skills shortages and an ageing workforce are among the key challenges facing power utility companies in North America and in many regions around the world. Again Elton highlights advantages that flow from the downturn: "Responding to the talent shortage has probably been a bit easier this year because of reduced hiring in the general economy. We're continuing to hire more young people to address demographic imbalances in the workforce."

Climate change policy

While utility companies are used to planning for the long-term, the stakeholder landscape is more complex and can be more short-term. "Our customers are less interested in the long-term trends and, in some jurisdictions, government policy has a tendency to change pretty quickly towards short-term measures," observes Elton. "A good example is environmental rules or legislation on climate change. It is tempting for governments to lose focus on that which I personally think would be a big mistake. I have seen that in some parts of the world, although not in our home market. Some form of carbon pricing is very important".

Sources: BC Hydro and CPI – PwC interview. RWE – Do It. The New RWE, Annual Report 2008. CPI quotes also published in *Risk, Responsibility & Opportunity: The CEO's guide to climate action*, PwC in conjunction with the Copenhagen Climate Council

CEO viewpoint: maintaining a focus on long-term sustainability

The importance of maintaining a focus on climate change is reiterated by Li Xiaolin, vice president of China Power Investment Corporation (CPI) and Executive Director, President of China Power International Holding Ltd. CPI was established from part of the constituent businesses of the former State Power Corporation of China and, by 2008, had controllable installed generation capacity of 51990MW and equity installed capacity of 40116MW. Li Xiaolin believes that "dealing with climate change now … will hopefully secure a happy and healthy future for our children" and stresses that climate change needs to be a priority CEO issue as it "benefits business operations — by becoming cleaner and more efficient, companies should secure increased profits over the long term."

In Europe, much of RWE's focus is on seeking a more certain long-term policy context. "Political decisions in the field of energy policy have a significant impact on the options available to the RWE Group to reduce CO_2 emissions sustainably," says RWE. As a utility with a significant proportion of coal-burning generation plant, RWE is likely to be a key player in the development of carbon capture and storage (CCS) technology but stresses that CCS needs more support from government: "We welcome the rules for the promotion of CCS power plants. However, the planned subsidy is unlikely to be sufficient to realize the ten to twelve demonstration plants envisaged by the EU. This will require further subsidies from the member states."

In China, CPI's Li Xiaolin makes the point that: "Stepping up scientific innovation and international cooperation will be crucial. Achieving development goals with minimum GHG emissions is a must-go direction for the future, which can only be made possible through technological innovation and international cooperation." She stresses that "efforts must be made to perfect the market mechanisms under the United Nations Framework Convention on Climate Change, with a focus on facilitating technological development and transfer, and to ensure that consensus is reached quickly in the international community. If these technologies can be transferred and deployed to developing countries at relatively low cost, it may well help reduce large amounts of GHG emissions."

RWE is seeking to more than triple generation from its renewable subsidiary, RWE Innogy, to 4.5 gigawatts by 2012. However, renewable plant is not sufficiently certain to be the mainstay for delivering base-load power.
RWE observes that "the most effective and affordable way to avoid emissions is to extend the lifetimes of nuclear power plants. Nuclear power generation emits practically no carbon dioxide, and if nuclear power stations are shut down, they will have to be replaced by higher-emission fossil fuel-fired power plants. This is because renewables-based facilities are not capable of generating the same amounts of base-load power. We could prevent up to an additional 15 million metric tons of CO_2 emissions per year merely by extending the lifetimes of our two Biblis units." This is a key focus of RWE's discussions with the German government.

A different kind of power sector

Looking further ahead, BC Hydro's Bob Elton foresees a world where the traditional model of large grid supply is turned on its head. He points to two key trends that will force change. "In developed countries, it is becoming increasingly difficult to build large infrastructure projects, whether that is power plant or transmission lines. Each one is getting more challenging and that will put a premium on demand side management and distributed generation." Urbanisation is another key trend influencing a future where distributed energy plays more of a role. Elton points out: "In 1800 only 3% of the world's population lived in urban areas, by 1950 it was 30% and by 2007 it was just short of 50%. By 2050 it is projected to be 67%. Cities will have to become increasingly self-sufficient."

"Distributed power sources will mean the grid will be the back-up service and not the primary means of delivery in the future" predicts Elton. Distributed generation and a revolution in demand side management will, in turn, demand different approaches by utility companies. "If you are an integrated company then you'll need to decide early on what kind of role you want to take in this new energy world. It will require new relationships with customers. Individual customers and communities of customers will be much more involved in developing their own solutions and companies will need to be very good at partnering and facilitating that."

United States

The United States moved into the downturn ahead of other world economies and has seen some of the most dramatic events of the financial crisis. Historic US federal government intervention, designed to prevent a more severe economic crisis, has come from both the outgoing Bush administration and the new Obama presidency. In this environment, fundamental operational matters have played a prominent role in US utility company priorities. Companies continue to focus on plant capacity and maintenance, customer service, long-term capital projects, rate case preparedness, and environmental/climate change readiness rather than on mergers and acquisitions or other strategic restructuring moves.

The drive to deliver shareholder 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 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, 67% of the US respondents to our survey cited 'improving capacity factors' as receiving a high focus in their companies (see US Figure 1).

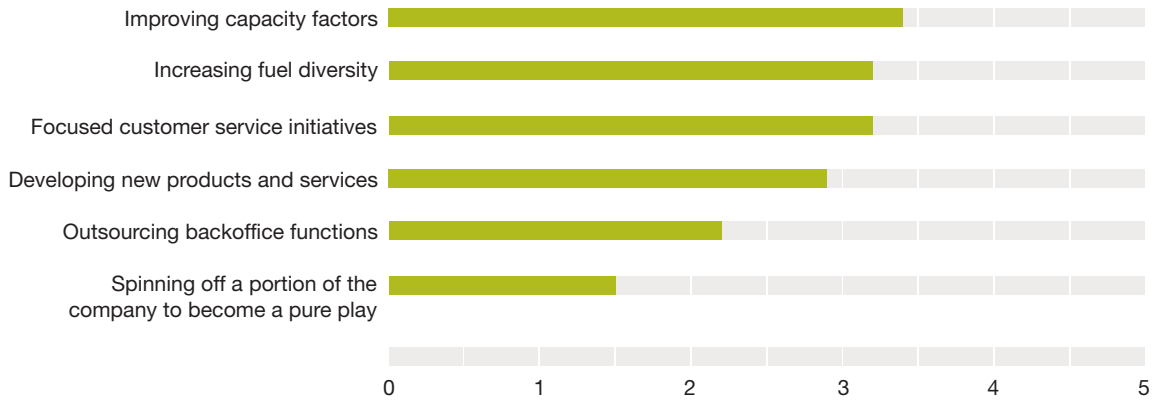
Utility managers are also focusing more on fuel diversity than they did in the past. This is cited as an important route to more shareholder value. Fifty-seven per cent of respondents reported that this was being given a 'high' or 'very high' focus. The importance of greater fuel diversity is partly 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.

Similarly, utility managers are seeking new ways to provide better and more efficient customer service with half of respondents giving this a high or very high focus as a means of delivering shareholder value. Investments are being made in new and information-rich customer billing systems.

Advanced metering infrastructure (AMI) and other smart meter/grid technology is being either 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.

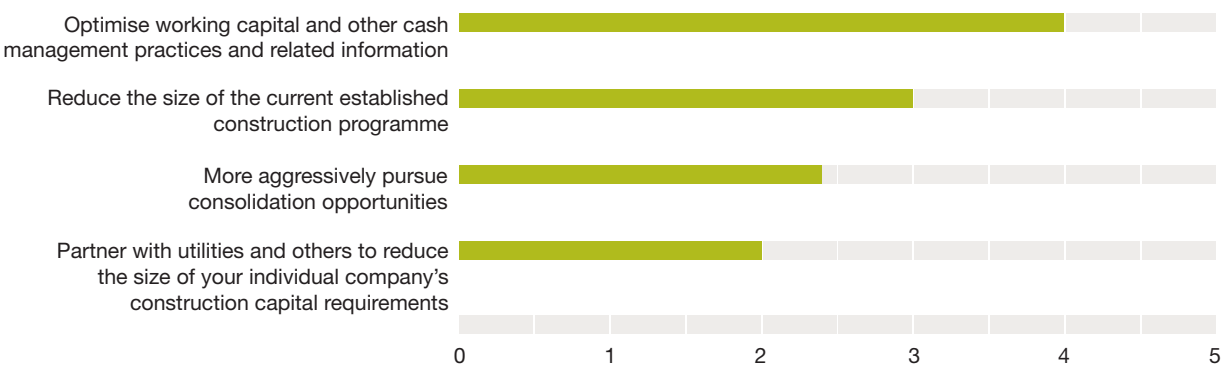
The ability to drive shareholder value is further complicated by the difficulties in accessing the capital markets. High performance in the areas of focus highlighted in Figure 1 are an integral part of demonstrating the ability to be an outstanding operator and thus not further limiting access to capital markets. Survey respondents are focused on optimising working capital and other cash management practices in order to respond to the increased tightening of the capital markets (see US Figure 2). In addition to the areas of focus above, working capital optimisation practices include such strategies as expense control, collateral management, maintaining headroom on existing credit facilities, and hedging interest rates and commodity price risk.

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 2009*

United States Figure 2: **How will your company respond to the increased difficulties to access the capital markets?**



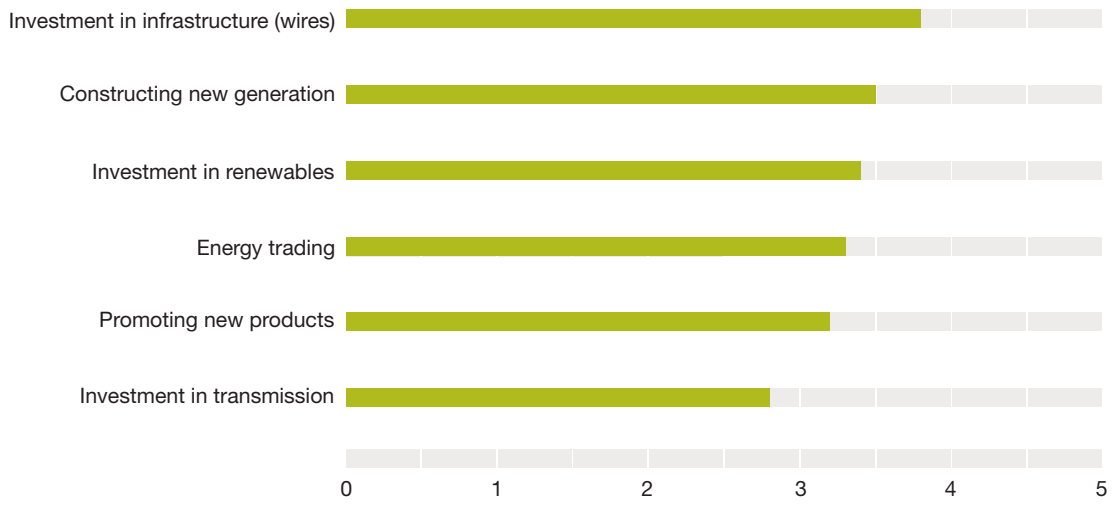
Note: Average response. Rate where: 5 = greater focus; 1 = least focus
Source: PricewaterhouseCoopers, *Utilities global survey 2009*

A focus on infrastructure and major construction

Large-scale construction and other capital projects began increasing at a rapid pace from 2006 onward. This trend has continued into 2009 with the announcement of many new projects, including an unprecedented level of focus on nuclear generation. Investment in infrastructure and construction of new generation head the list of strategic growth priorities for survey respondents in the coming year (see US Figures 3 and 4). Transmission congestion, carbon and other government environmental initiatives, increased demand in certain markets and the need for greater reliability are among the issues most often cited by utility managers as drivers of this investment.

There is also new interest in nuclear construction as utilities, independent power producers, and other industry participants develop generation to meet the demand for new capacity. The sizable costs of such an environmentally driven investment, allied with the related construction risk, mean companies and regulators will need to collaborate thoughtfully to ensure shareholder and ratepayer interests are equitably maintained. There may be significant hurdles to obtaining financing for new construction. In addition, even if financing is available, the resurgence of construction has created a long lead time and increasing prices. These issues may further delay development.

United States Figure 3: **What are your company's strategic growth opportunities?**



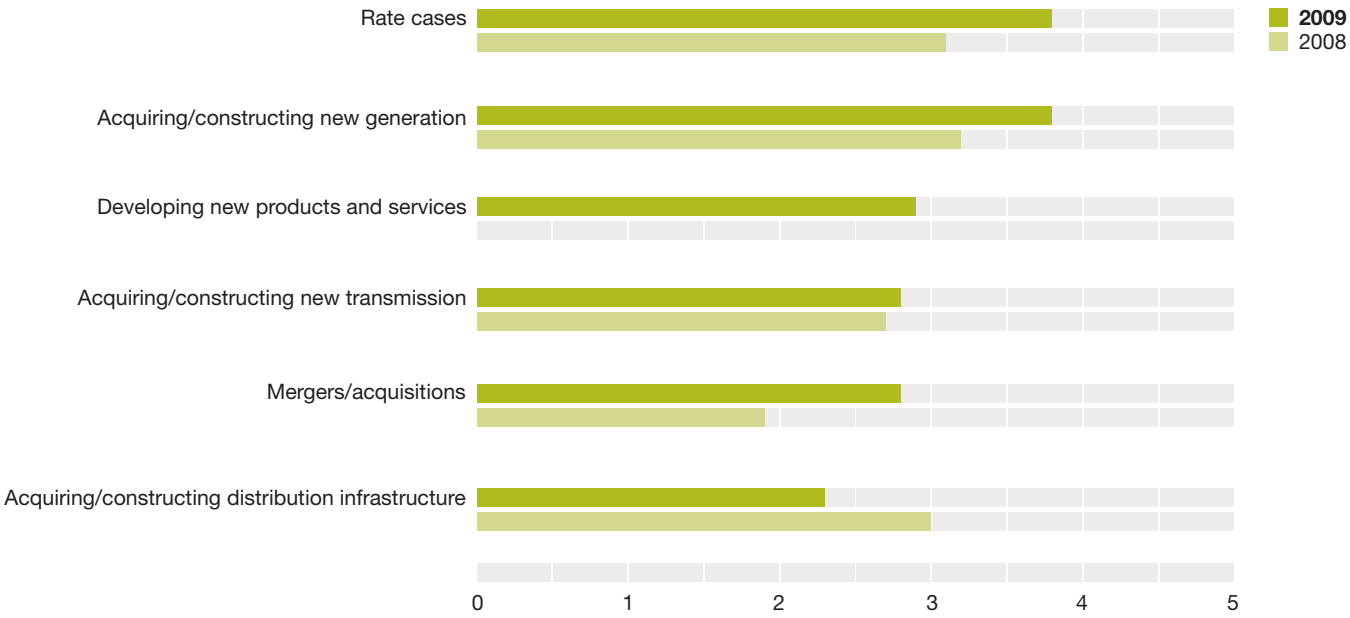
Note: Average response. Rate where: 5 = most strategic; 1 = least strategic
Source: PricewaterhouseCoopers, *Utilities global survey 2009*

Regulation and government – the new administration

The beginning of 2009 ushered in a new political administration focused on embracing economic recovery. Utilities continue to experience rising costs for power, materials, labour, and other costs to provide services. In addition, transition periods and rate freezes have ended or are ending in many states. Rate cases are now the number one focus for utility companies in the coming 12 months. Many utilities are filing rate cases for the first time in years and are requesting significant rate increases to cover these rising costs and capital investment.

Consistent with expectations and the focus on market recovery, regulators are continuing to allow lower returns and rates than requested. The average return on equity received in 2008 rate cases was 10.28% versus an average requested rate of return of 11.13% (SNL Interactive). Mergers and acquisitions (M&A) are beginning to trend upward as compared with the prior year's responses. M&A is likely to be an important part of many company strategies as they respond to deregulated market opportunities and the capital market environment.

United States Figure 4: **Over the next year, what will your company's focus be on?**



Note: Average response. Rate where: 5 = most focus; 1 = least focus
Source: PricewaterhouseCoopers, *Utilities global survey 2009*

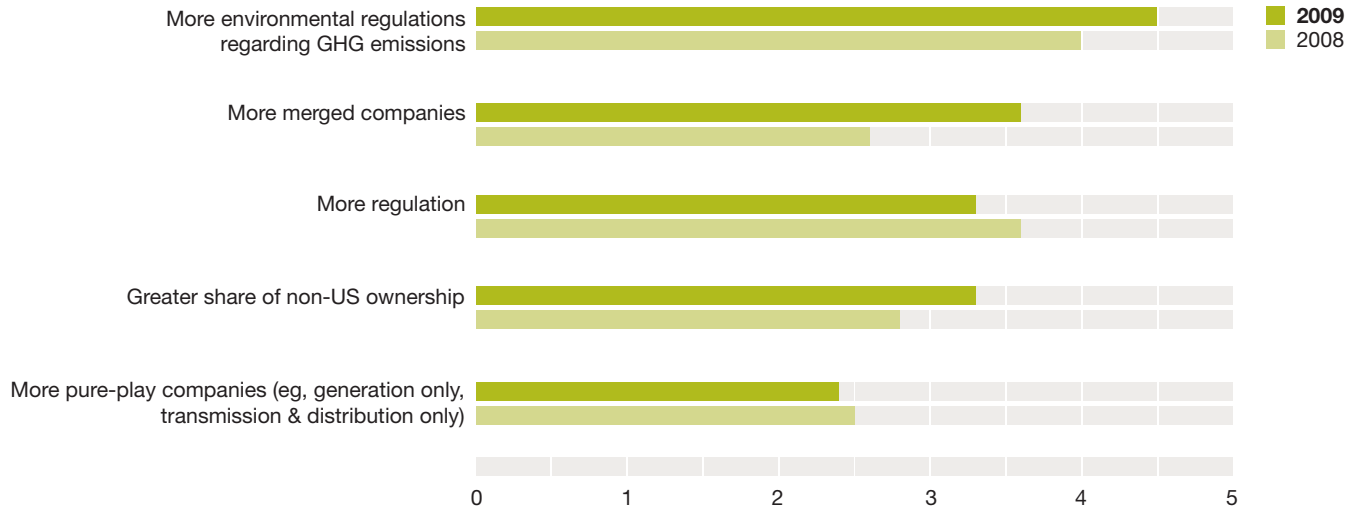
Rising costs and regulatory transition have elevated rate cases to the top focus of US survey respondents

GHG emissions – the big change issue

Looking ahead, US utility company senior executives are increasingly aware that legislation limiting GHG emissions is forthcoming with Congress seeking a cap-and-trade system and the administration supporting more Environmental Protection Agency (EPA) regulations and oversight. The vast majority (91%) of survey respondents expect a 'big' or 'very big chance' of more carbon emission regulation and none see a 'low chance' of more regulation (see US Figure 5). In this environment, power companies that own coal plants are reluctant to make investments in their existing or new assets as new regulations may significantly impact their decisions.

Further, US utility company senior executives see more mergers on the horizon – exactly half see a 'big' or 'very big' chance of more merged companies and a further 42% report a 'medium chance' of more M&A . Mergers may be necessary to raise capital to fund improvements and new construction. Support for critical infrastructure and renewable energy may lead to less complicated regulatory M&A approval. There is also a significant expectation of more foreign ownership coming into the sector – 84% gave this scenario a medium to high probability and none gave it a 'little or no chance' rating.

United States Figure 5: **What will be the biggest change in the US utility industry over the next five years?**

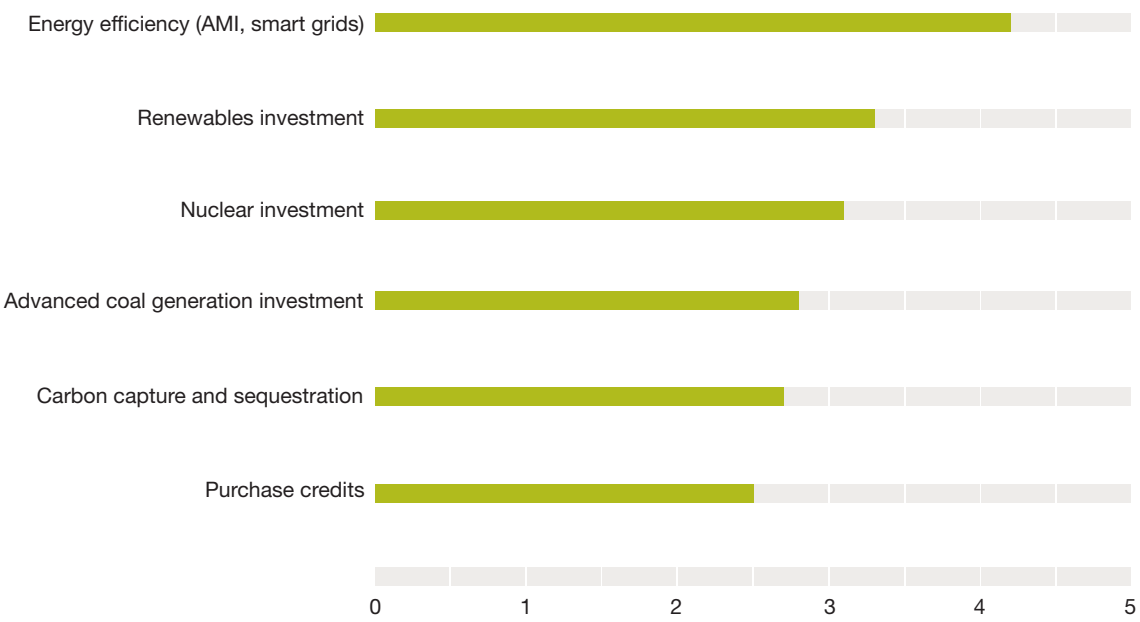


Note: Average response. Rate where: 5 = most change; 1 = least change
Source: PricewaterhouseCoopers, *Utilities global survey 2009*

To manage environmental demands, utility managers plan to make a range of technological and generation investments, headed by 'energy efficiency' technologies such as AMI (see US Figure 6), which 83% of respondents viewed as 'very important' or 'most important' with the remainder rating it as 'medium importance'. Renewables investment is also important. An increasing number of power deals have been for renewable assets or technology with wind energy leading the trend. Growth in 'renewables' will be fuelled by tax incentives and public sentiment for clean energy.

The new administration has pledged to significantly increase the production of alternative energy in the next few years to create a clean energy economy. A third of US survey respondents were attaching a 'most important' rating to renewable investment with a further third rating of medium or high importance to their companies' strategy for dealing with climate change. Significantly, half of survey respondents highlighted nuclear investment as 'most important' or 'very important' to their companies' climate change response.

United States Figure 6: **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 2009*

Nuclear license applications are on the rise and pro-nuclear sentiment is growing

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. Respondents have been accurate in some of their past projections. Last year, respondents generally felt that the markets were indicating the price was right (76%). With the significant fluctuations in the market during 2008, current year respondents have changed their views, with 67% now believing their stock is undervalued. The outlook among respondents continues to be bullish, with 75% expecting utility company stock prices to rise in the coming 12 months.

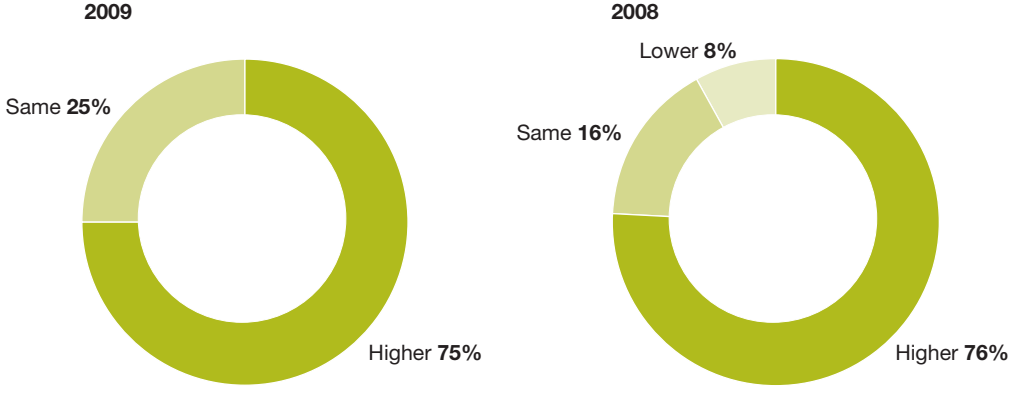
The impact of IFRS

Most of the world already talks to investors and stakeholders about corporate financial performance in the language of International Financial Reporting Standards (IFRS). In addition, US investors buy securities issued by foreign companies that report their information using IFRS. The Securities and Exchange Commission (SEC) continues to drive toward the adoption of IFRS to allow US companies to compete fairly against foreign companies for capital, as their financial information would be presented on a consistent basis of accounting.

United States Figure 7: **Is your utility company's stock appropriately valued?**

Source: PricewaterhouseCoopers, *Utilities global survey 2009*

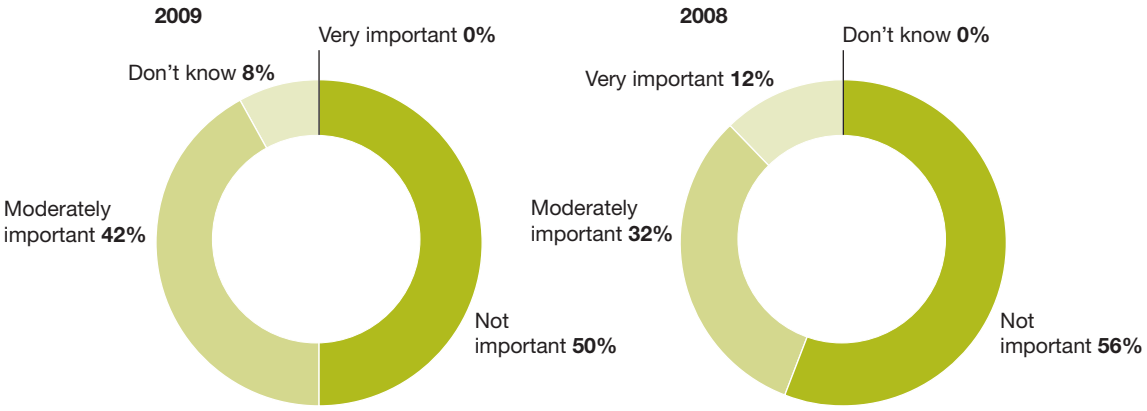
United States Figure 8: **What movement do you expect in utility stocks over the next twelve months?**



Source: PricewaterhouseCoopers, *Utilities global survey 2009*

In the second half of 2008, the SEC issued a roadmap for the adoption of IFRS as the primary financial reporting standard in the US for SEC registrants but has indicated that it will evaluate certain milestones before it mandates use of IFRS by all US registrants. Our survey indicates that the significance of IFRS is perhaps only just beginning to be felt in the US power utilities industry. Fewer than half of respondents believe a change to IFRS will be important to their companies, with 50% saying it will not be important (see US Figure 9). As the SEC continues to drive toward 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 9: **How important will a change to International Financial Reporting Standards (IFRS) be to your business?**



Source: PricewaterhouseCoopers, *Utilities global survey 2009*

Awareness of IFRS significance slow to take hold

Canada

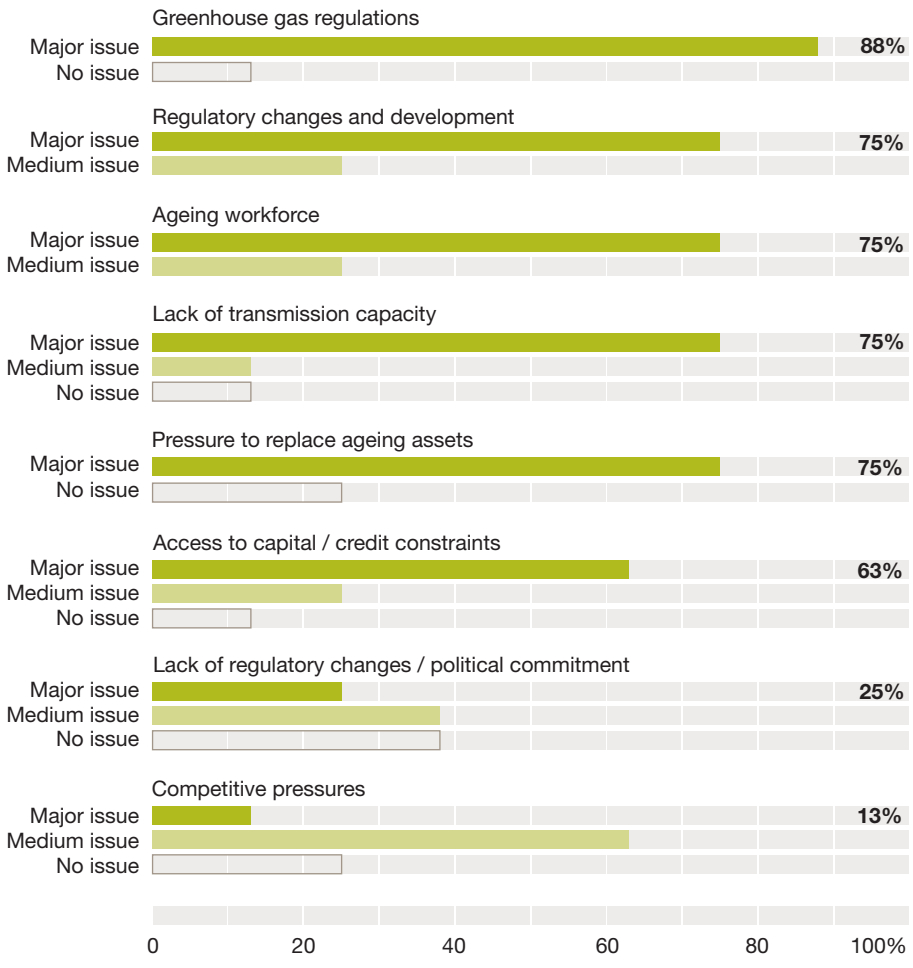
In common with many parts of the world, the challenge of responding to climate change and other regulatory challenges are at the top of major concerns facing the Canadian utilities sector. In addition, Canadian survey respondents highlight the problems of an ageing workforce and physical infrastructure as well as stretched transmission capacity (see Canada Figure 1).

Regulation

Regulatory concerns tend to be regionally specific. In Ontario, concerns about the size and scale of investment required in generation and transmission dominate with regulatory delays adding to cost concerns. In Alberta, much of the focus is on delays in getting major transmission projects moving, in particular a new transmission line between Calgary and Edmonton.

In 2007, the Alberta Energy Minister stated that "transmission is Job 1" Two years later, the project is still stalled and, in March 2009, the independent international research organisation, the Fraser Institute, called for a complete rethink of the Alberta transmission policy. In other Western Provinces transmission is also an issue with plans in Manitoba to build additional transmission capacity from the north.

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



Source: PricewaterhouseCoopers, *Utilities global survey 2009*

People

The recent economic slowdown and consequent spike in available staff does not appear to have had a significant impact on concerns about the skills shortages associated with the imminent retrial of long term experienced employees. Recent increases in the availability of junior and intermediate staff are unlikely to mitigate these concerns as it is not possible to rapidly replace the level and quality of the skills associated with retirees with junior or recent staff. The one area where the recent economic slowdown may have a beneficial impact is in the availability of skilled construction personnel and contractors.

Climate change

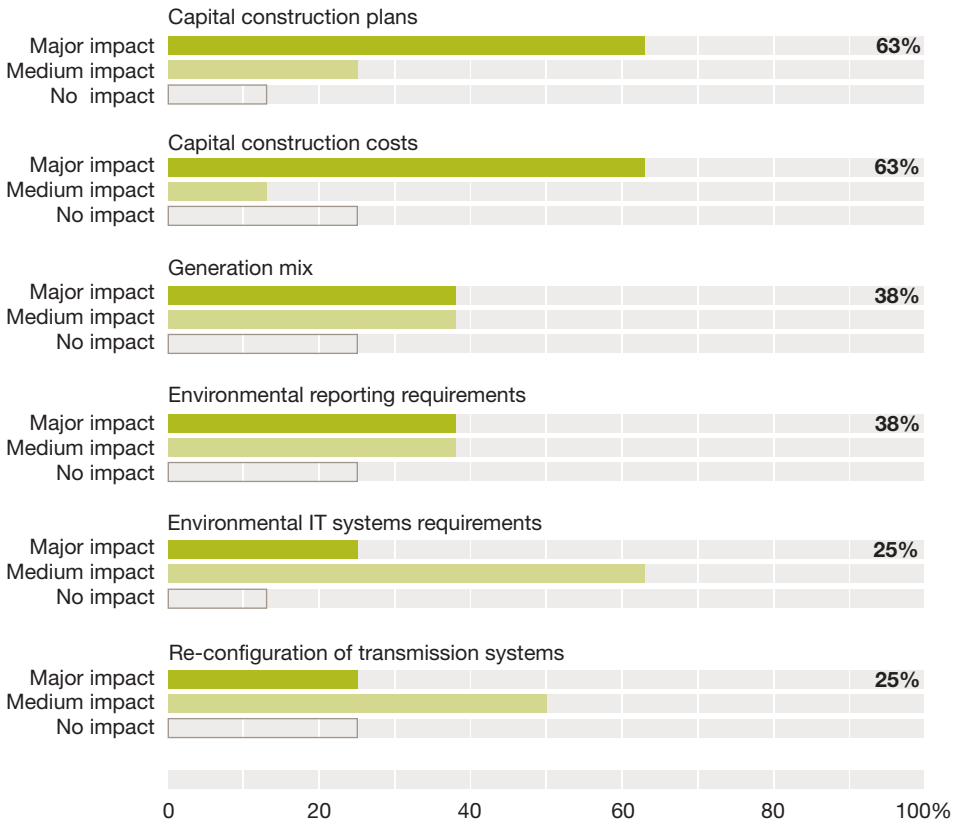
Climate change regulation in Canada is in a state of flux. British Columbia and Alberta have implemented carbon policies that are explict or implicit taxes on carbon emissions and the federal government has also implemented a regime. There is a strong commitment to the concept of 'intensity based' measures.

Such measures seek to restrict emissions to some pre-specified rate relative to input or output. However the financial impact and key underlying concepts of this regulation are being fundamentally affected by the collapse in energy prices and the rapid development in US policy.

Utility companies in our survey report that the issue of managing greenhouse gases (GHGs) is already having a considerable impact on their operations, in particular on capital construction plans and costs (see Canada Figure 2). Most companies are reviewing their generation mix – only a quarter say that GHGs are having little impact on the fuel mix.

There is significant investment by Canadian utility companies in wind power and very significant new hydro investment planned in specific locations in Quebec, Alberta and British Columbia. Expansion of nuclear power is also receiving strong backing. Alberta and Saskatchewan are two provinces that have previously been largely reliant on fossil fuels but now both have nuclear power plant proposals. There is also renewed investment in nuclear technology in numerous Ontario locations as well as refurbishment projects for reactors in Quebec and New Brunswick.

Canada Figure 2: **What has been the impact of the greenhouse gas issue on the following areas?**



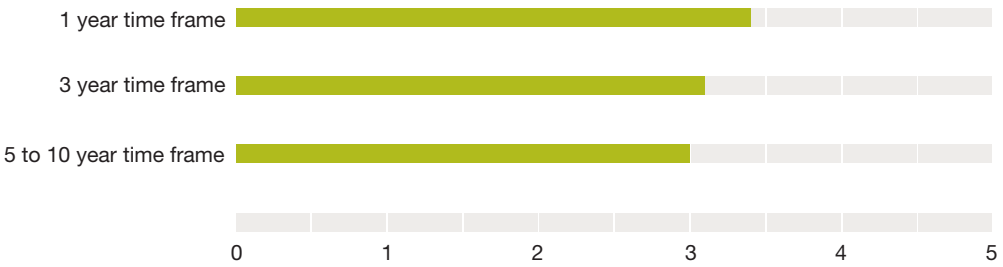
Source: PricewaterhouseCoopers, *Utilities global survey 2009*

Capital constraints

The credit crunch and ensuing financial crisis is having an impact on the availability of funding for utility company capital projects and other purposes (see Canada Figure 3). Half of Canadian survey respondents report that diminished access to capital is having a significant or major impact (scores of 4 or 5) on their planning over the coming 12 months and another quarter report a medium impact (a score of 3) over this time frame.

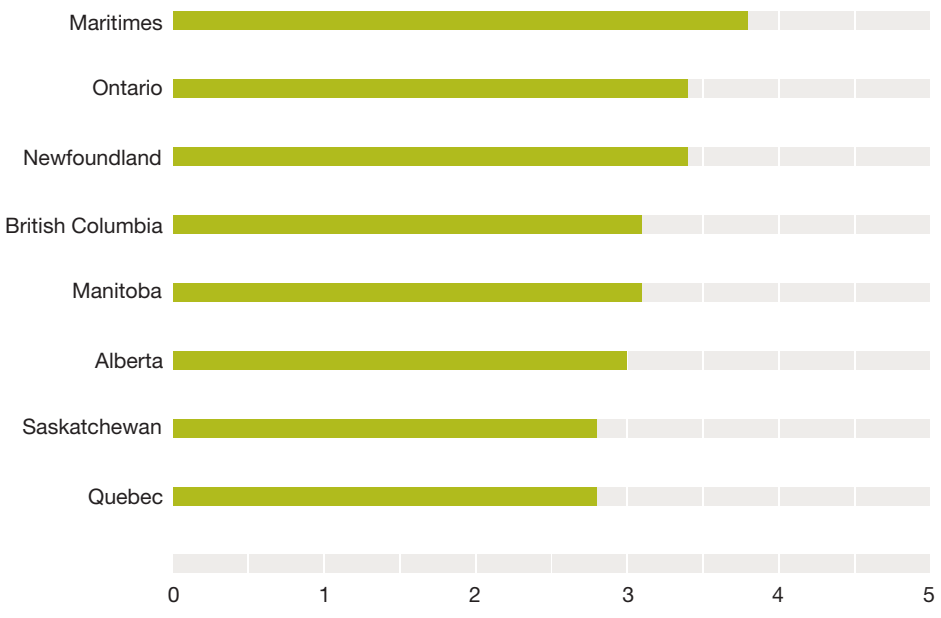
Nearly two-thirds (63%) viewed credit constraints as a significant issue for the sector (see Canada Figure 1). However, Figure 3 indicates that utility company executives expect these constraints to improve over time as current financial conditions ease. Figure 4 indicates some optimism about the potential for additional private sector financing through public private partnerships in some provinces. This is particularly the case in the Maritimes and Atlantic Provinces and Ontario, where expenditure needs are especially high.

Canada Figure 3: **What is the likely impact of diminished access to capital/credit constraints?**



Note: Average response. Rate where: 5 = major impact; 1 = no impact
Source: PricewaterhouseCoopers, *Utilities global survey 2009*

Canada Figure 4: **What is the likelihood that jurisdictions in Canada currently primarily serviced by Crown Corporations (or similar publicly owned entities) will seek to increase current level of public/private partnerships or other sources of private sector investment?**



Note: Average response. Rate where: 5 = very likely; 1 = not likely
Source: PricewaterhouseCoopers, *Utilities global survey 2009*

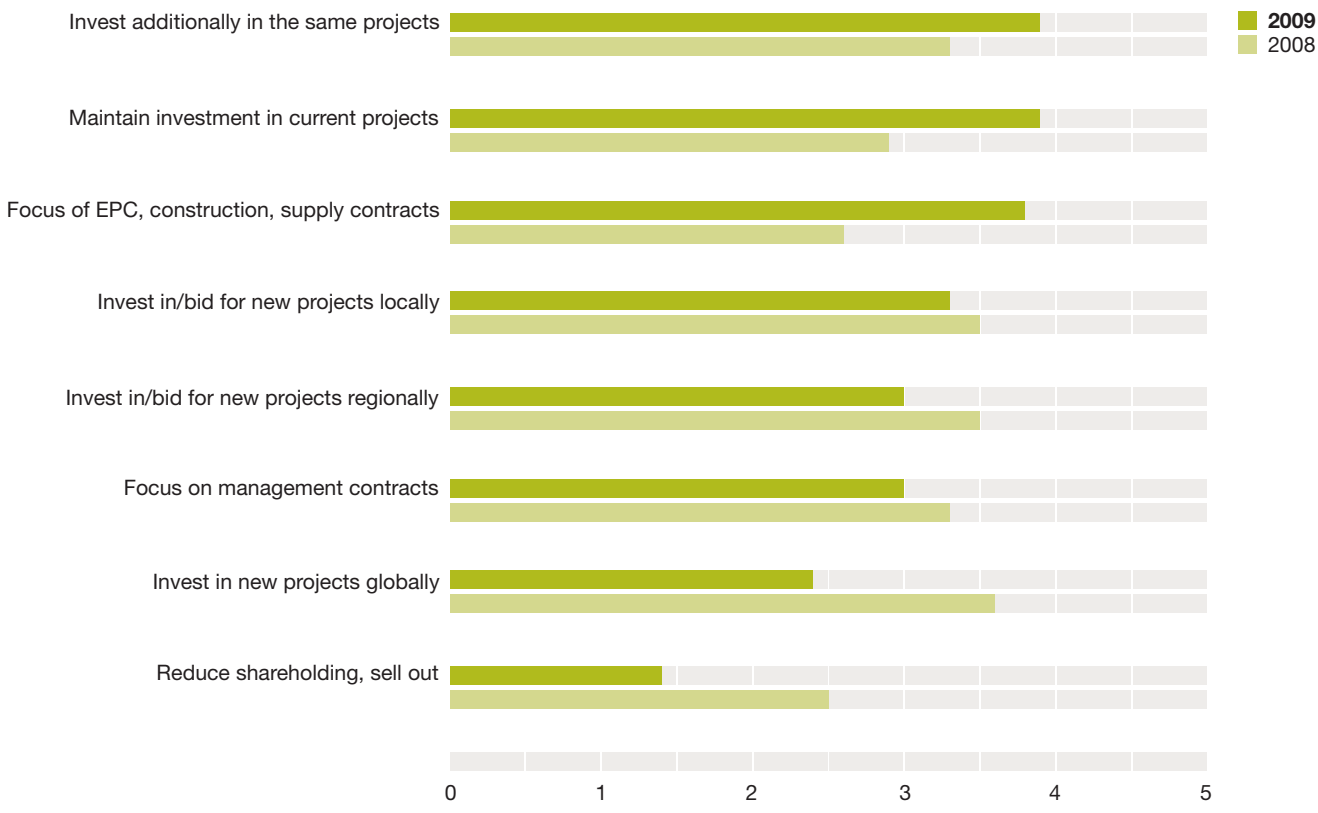
South America

After several years of strong economic growth, expansion in the region is weakening in response to the wider global economic downturn and financial crisis. The International Monetary Fund has forecast that Latin America GDP economic expansion will drop to 1.1% in 2009 after unprecedented annual expansion over the last six years at a rate of around 5%. In its March 2009 forecast, the World Bank anticipated that the Latin American economy is likely to contract in 2009, experiencing a drop of 0.6%.

Stalling or contracting economic growth is being accompanied by continuing tight financial conditions as the fall-out from the banking crisis runs its course. Most countries, whether developing or high income, have not been exempt from the impact of the financial crisis. Since developing countries have had less access to international capital markets, the slowdown will affect them mainly through indirect mechanisms, including reduced demand for their exports, lower commodity prices and reduced capital inflows.

During the extraordinary growth years, different countries pursued different economic policies and criteria that have had implications in the utilities arena. On one hand, Brazil, Chile, Uruguay, Peru and Colombia have seen improvements in their outputs, which have translated into the energy field. On the other hand, Venezuela and, in large part, the remainder of the countries in the region, have seen declines in energy activity.

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



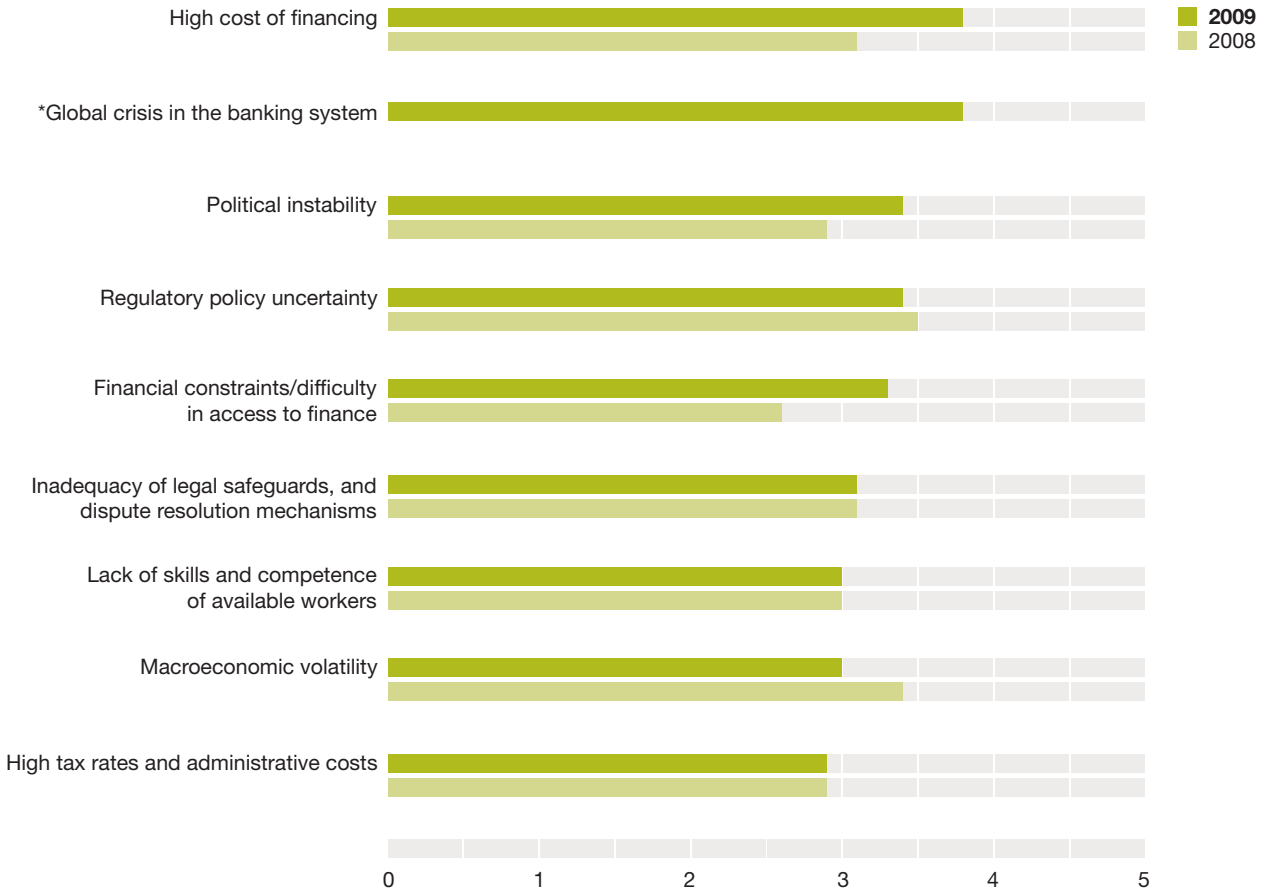
Note: Average response. Rate where: 5 = most focus; 1 = least focus
Source: PricewaterhouseCoopers, *Utilities global survey 2009*

The investment outlook

As can be seen in Figure 1, there has been a significant shift in the investment priorities of utility companies. Compared to responses in last year's survey, the appetite to invest in new projects, particularly outside the region, has been curtailed. Instead, priorities at present are focused on current projects, either to invest additional funds or just to maintain existing investments. The dampening of new project investment ambition also reflects energy policies implemented in countries like Bolivia, Venezuela and Ecuador, where many utilities have been nationalized impacting the investment plans of several companies. In addition, utility prices have remained relatively low in some countries, such as Argentina and Bolivia, discouraging investment in new infrastructure and concentrating efforts on maintaining current projects.

The changed investment priorities stem from the main concerns identified by survey respondents (see South America Figure 2). Both the high cost of financing and the global crisis in the banking system went from being among the least worrisome or 'unremarked on' issues in 2008 to become the two major concerns for 2009. The main concern in 2008 – regulatory uncertainty – remains a significant concern but has been eclipsed by the financial and global economic crisis. As well as the high cost of finance, survey respondents are more worried about the difficulty of accessing finance compared with 12 months ago. In contrast, macroeconomic volatility declined in importance, maybe in line with respondents' expectations of flatter economic growth. Perhaps in response to the implications of flat or contracting macro economic conditions, survey respondents once again express some concern about potential political instability, a factor which had declined in importance in the 2008 survey.

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?**



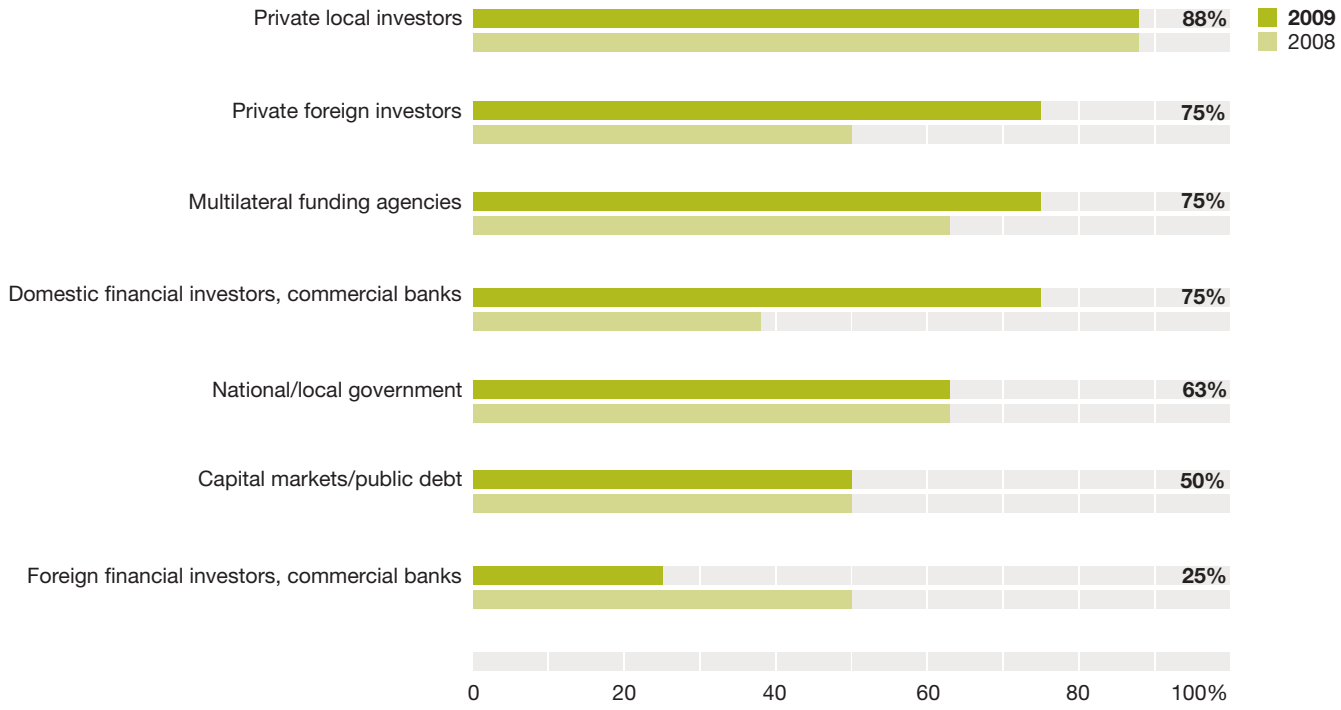
Note: Average response. Rate where: 5 = most concern; 1 = least concern
*Question not asked in 2008
Source: PricewaterhouseCoopers, *Utilities global survey 2009*

Future financing

Respondents believe that the main financial sources for next year will come from the private sector, primarily from local sources although with a continuing prominent role being played by private foreign investors and multilateral funding agencies (see South America Figure 3). The role of domestic versus foreign banks has changed sharply from last year. The state of the international financial markets and banking sector has led to only a quarter of respondents expecting to get finance from foreign banks or financial investors in this year's survey compared with half last year. In parallel, the expected role of domestic financial investors, such as commercial banks, has moved in the opposite direction, being considered as a financial source for the utilities sector by 75% of respondents compared to just 38% last year.

It should be noted that all financial options, with the exception of international commercial banks, have increased or maintained the previous year's level. This result could indicate that utility companies will seek funding from multiple sources with the objective of achieving the necessary funds to make investments in new or existing projects. There has been a process of intensification of the role of the national government in the economies in many South American economies in the past year, both through nationalization of companies as well as in infrastructure planning and levels of investment, which provides some context to the 63% of those surveyed who mentioned government finance.

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



Source: PricewaterhouseCoopers, *Utilities global survey 2009*

Sustainable energy

Alternative sustainable energy pricing will affect competitive electricity pricing in the near future. Gas (both pipeline and liquefied natural gas) still stands out, and with more emphasis than previous years, as the main sustainable energy source identified by the respondents, followed by hydro power (see South America Figure 4). Half of the electricity generated in Latin America comes from hydropower sources and one quarter comes from natural gas sources. It is important to emphasise that these figures vary significantly between the various countries in the region. For example, in Brazil the greater part of generation comes from hydro power sources while in Argentina it comes from natural gas.

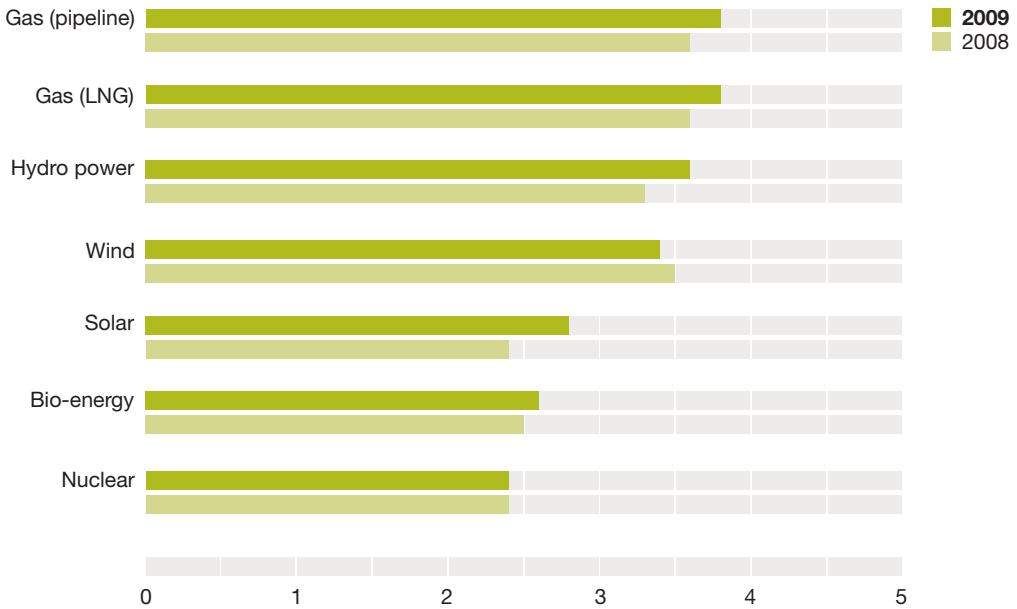
The importance of Liquefied Natural Gas (LNG) has been growing since 2007 as concerns grow about the reliability of supply from net exporting countries like Bolivia and Argentina. This has encouraged countries such as Chile and Brazil to analyse the possibility of installing LNG liquefied plants in their territories. Respondents attach relatively less importance to bio-energy, nuclear and solar power in terms of their impact on future electricity pricing.

Restructuring of power markets

Performance improvement remains in first place as the key driver for restructuring of generation and distribution markets (see South America Figure 5). In the light of the more constrained financial market context, lack of investment and the inability to maintain networks, identified as the least important driver in 2008, rose in importance in the minds of survey respondents to be the second key driver. Other factors, such as tariff rationalisation, competition, legislation and improved customer care, are also seen by senior utility executives as more important key drivers than in the past, but still play an underpinning role to performance improvement and investment.

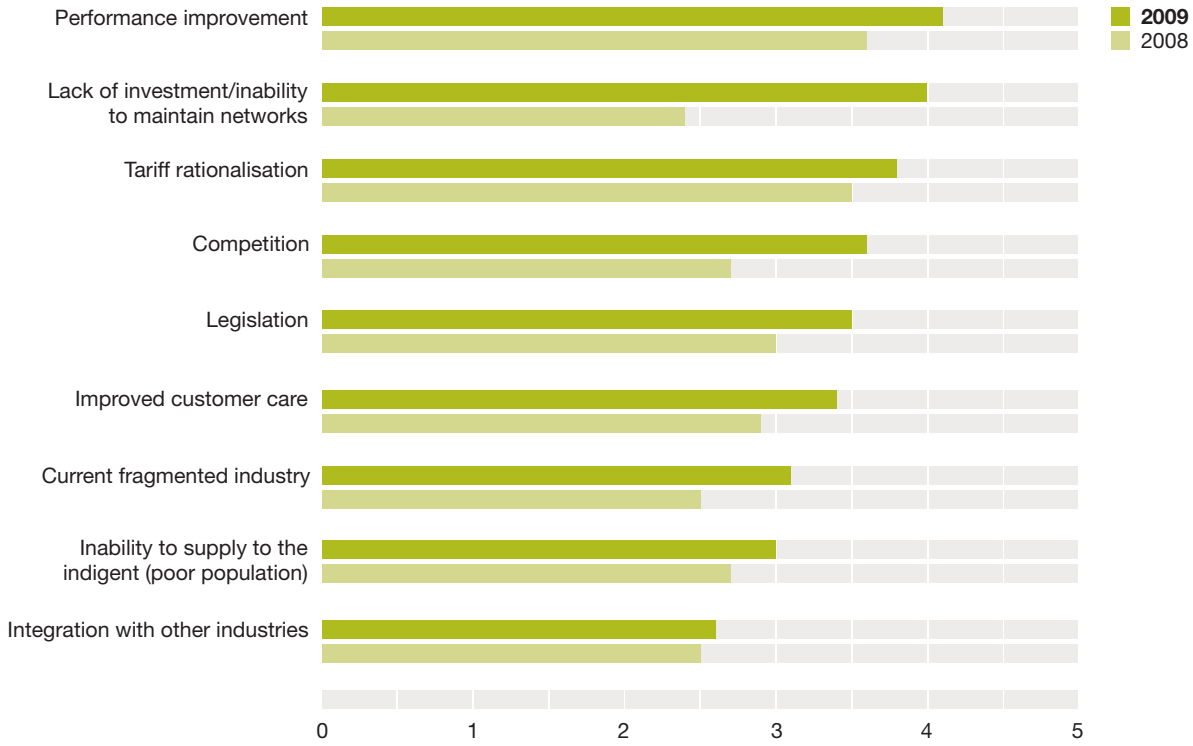
Reflecting the focus on performance improvement, cost reduction and a return to core business are seen as the main tactics to improve utility company profitability (see South America Figure 6). However, cost reduction is not expected to be achieved primarily through personnel reduction. Price/ tariff increases continue to be seen as an important contributor to improved profitability although reorganizing capital structure, which took first position last year, has declined in importance, again reflecting the more constrained financing environment.

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?**



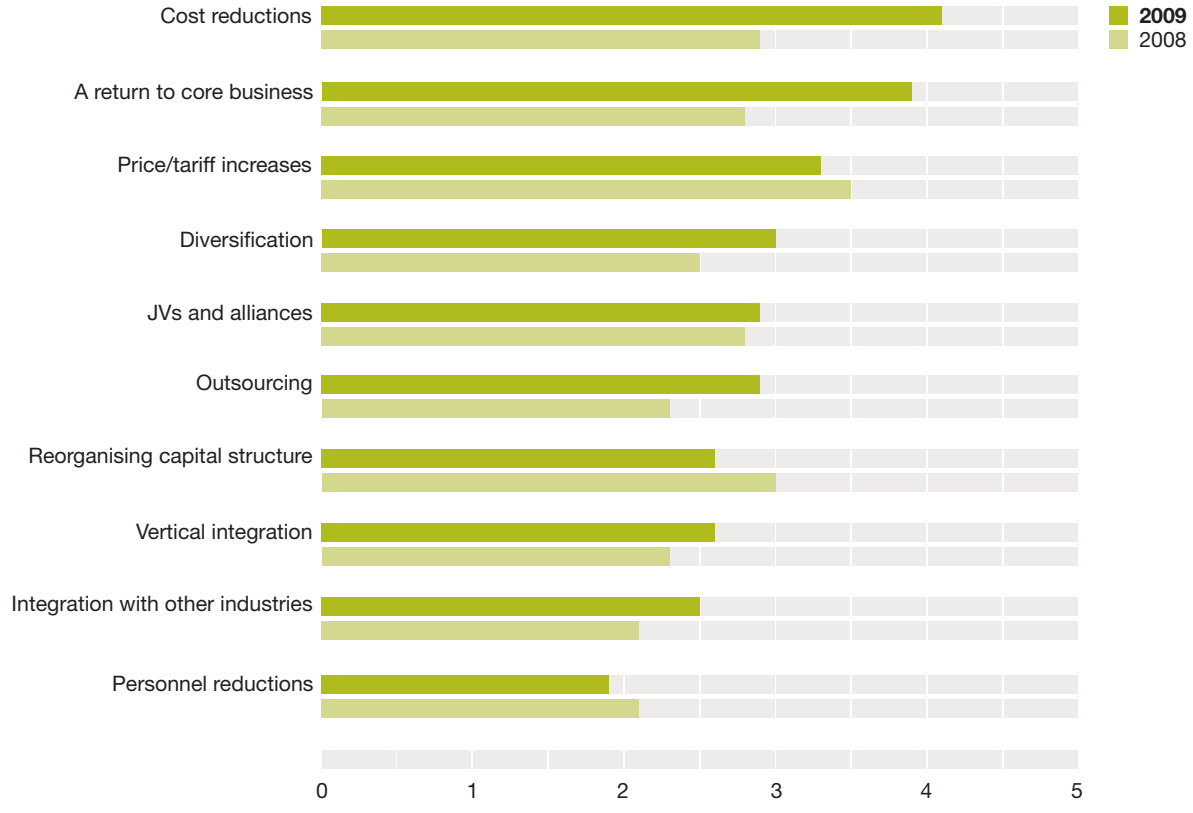
Note: Average response. Rate where: 5 = strongly affect; 1 = least affect
Source: PricewaterhouseCoopers, *Utilities global survey 2009*

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



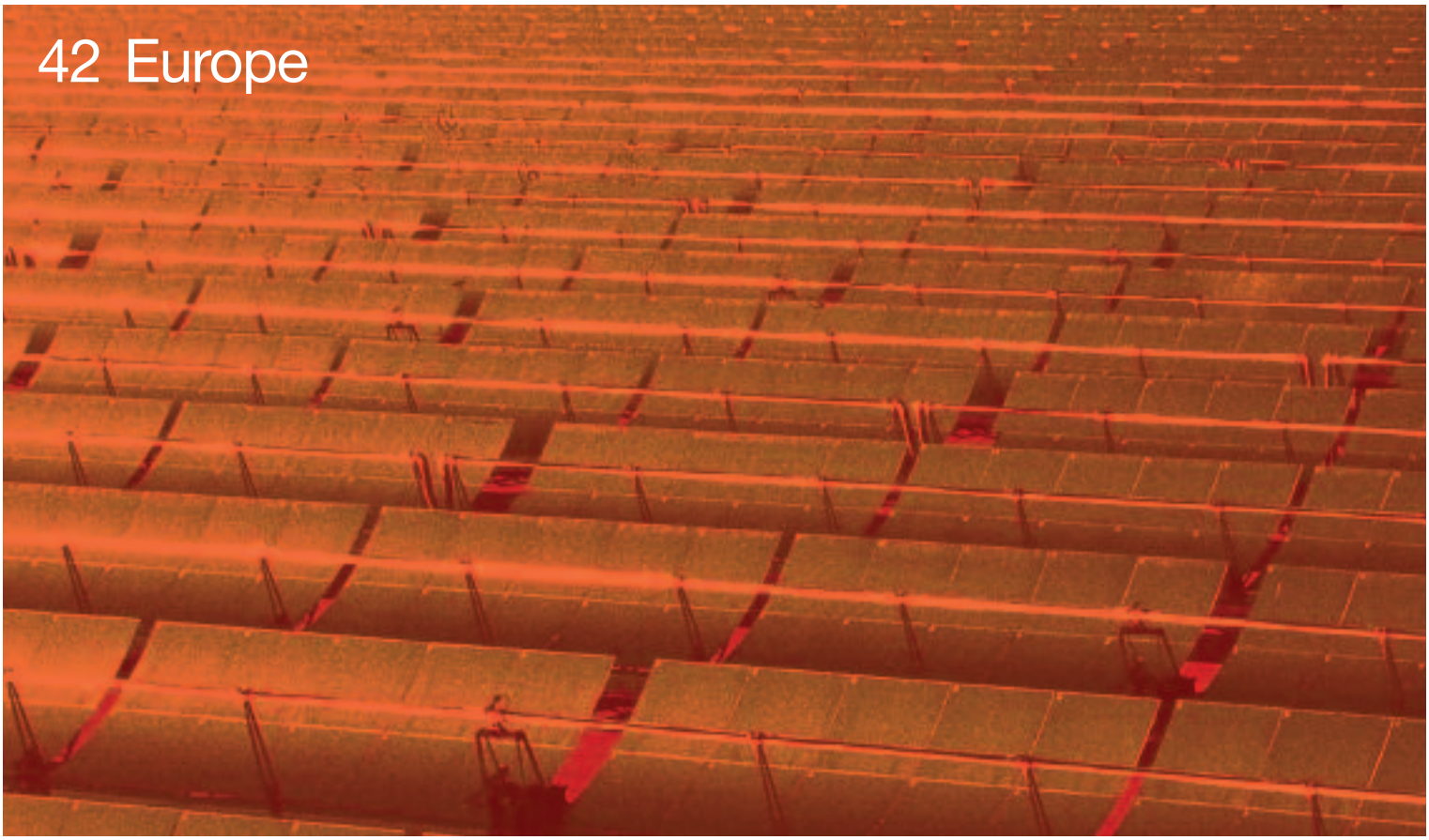
Note: Average response. Rate where: 5 = major driver; 1 = not a driver
Source: PricewaterhouseCoopers, *Utilities global survey 2009*

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 2009*

42 Europe



Energy security, cleaner energy, market competition and energy infrastructure have been the issues dominating the European power market agenda. Ahead of the recession, European leaders set their sights some way forward by committing to a 20:20:20 ambition of 20% emissions reductions, 20% renewable energy and a 20% improvement in energy efficiency by 2020.

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 in 2009.

Carbon price outlook

The prices paid for permits to produce carbon under the European Union's emissions trading scheme (EU-ETS) fell significantly in the second half of 2008 and the early part of 2009, from around Euro 30 per tonne CO_2 in summer 2008 to only about Euro 8 in February 2009, before recovering to around Euro 14 in April 2009. At such levels, carbon prices are below the level needed to deliver a strong pricing signal for the development of cleaner energy. Europe's senior utility company executives see a mixed outlook for future carbon prices for the remaining period of phase 2 of the ETS until 2012.

Out of our European survey respondents, a quarter envisage the price remaining at a sub Euro 20 level with three-quarters not expecting it to top the Euro 30 price reached in mid 2008. However, a quarter of respondents are more bullish, pointing to an upward trend above the Euro 30 level.

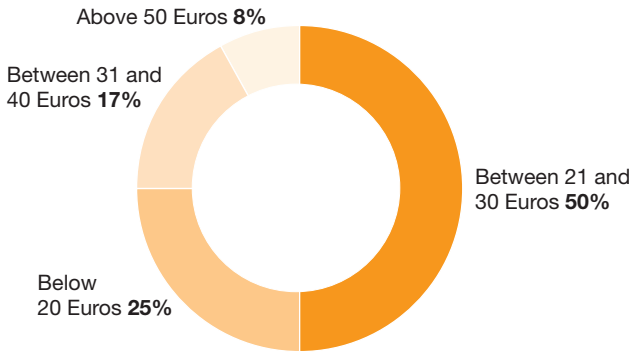
Declining industrial activity, resulting in reduced electricity and fuel demand, is putting downward pressure on carbon prices. The extent of the economic downturn will be a key factor shaping the carbon markets in 2009. Many companies are scaling back or delaying investment in capital intensive emissions reduction projects as it is now more cost-effective to buy carbon credits.

In the longer term, however, more than half the companies surveyed expect carbon prices to be higher in phase 3 of the EU-ETS after 2012. In late 2008, EU ministers confirmed that the cap in phase 3 would be 1,847MtCO_2 per year and that, subject to concessions for internationally-competitive heavy industries, auctioning would be the principal allocation method. From 2013 there will be limited free allocation to the power and heat sector. The free allocation to major industrial sectors will ratchet down over the period to 2020 – although those exposed to international competition are expected to receive some dispensation. In our survey, many utilities expected auctioning of allowances in phase 3 would push the price up – although a similar number suggested that auctioning would not affect profitability.

Moves to cleaner power

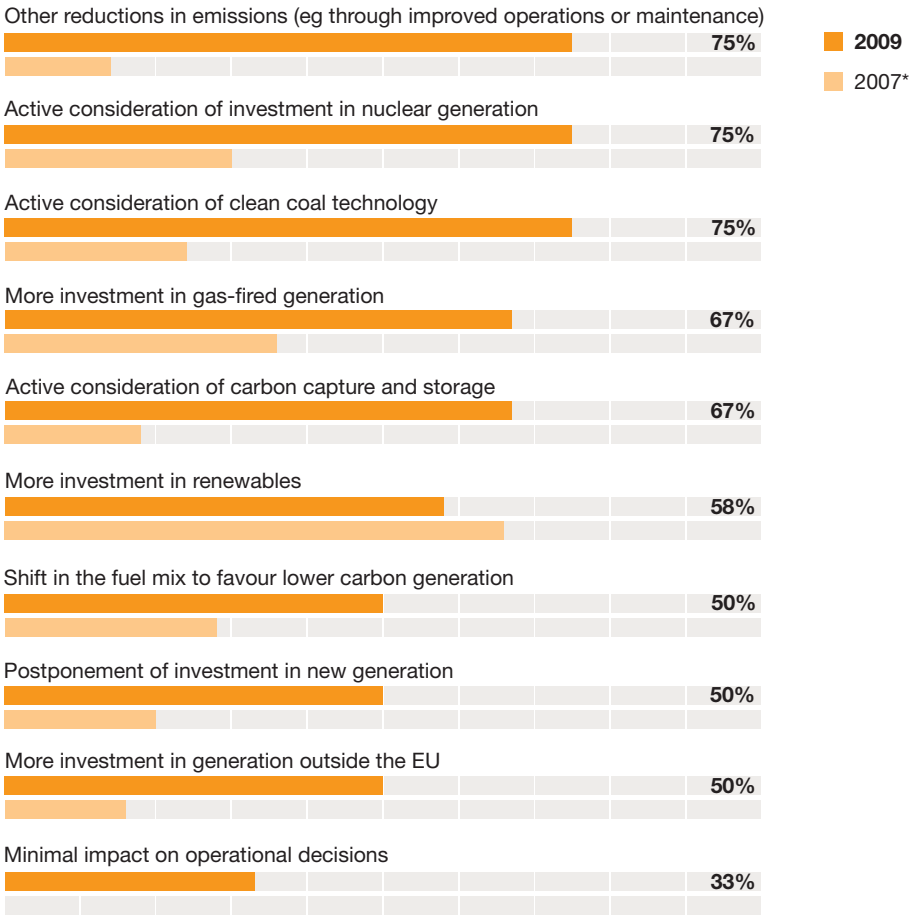
It is the longer-term view of carbon prices that appears to be the dominant consideration in utility company operational responses. Three-quarters of the utilities surveyed are considering investment in clean coal or nuclear generation, and two thirds stated that the EU ETS will prompt more investment in gas-fired generation in phase 2. As Europe Figure 2 shows, the impact of ETS has been to accelerate moves to reduce the emissions of existing operations and to promote consideration of nuclear generation and clean coal technology, among a range of measures which are now much more strongly on the agenda of European power utility companies compared with just two years ago.

Europe Figure 1: **What is your estimate of the average carbon price during the period 2009-2012?**



Source: PricewaterhouseCoopers, *Utilities global survey 2009*

Europe Figure 2: **What impact will phase 2 of EU ETS to 2012 have on your business?**



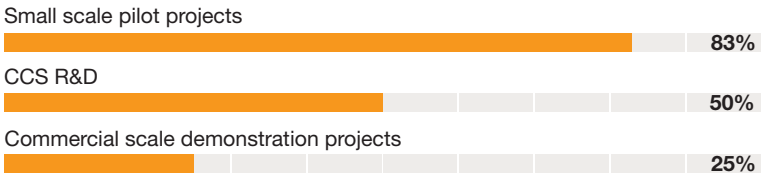
*in 2007, the question was '*What impact has the EU ETS had on your business since 1 January 2005?*'
Source: PricewaterhouseCoopers, *Utilities global survey 2009*

In the World Energy Outlook 2008, the IEA estimates that 162 GW of generating capacity with carbon capture and storage (CCS) is needed by 2030 to avoid the worst effects of climate change – this is equivalent to bringing on stream 10 projects per year over that time frame. It is, therefore, encouraging that 83% of respondents from utilities in Europe report that their companies are evaluating CCS projects (see Europe Figure 3). The critical challenge is overcoming the economic barriers and getting the projects off the drawing board or moving from demonstration to full-scale deployment – a combination of direct government incentives, regulation and a carbon price signal is needed.

European electricity low carbon declaration

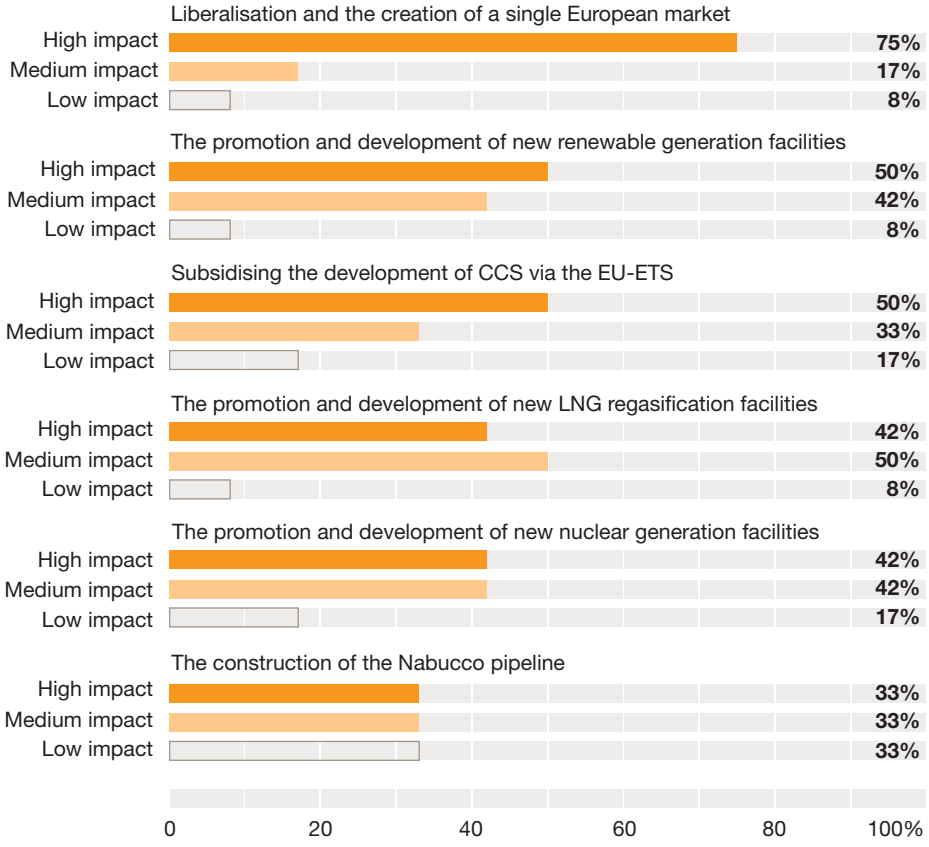
In March 2009, nearly 60 chief executives from leading European electricity companies, including Eon, RWE, EDF, Enel and Iberdrola, met in Brussels to urge stronger action to support low-carbon electricity. According to the Financial Times, they pledged to make electricity carbon free by 2050 but said that measures such as the speedier release of government subsidies for carbon capture and storage would be essential for this ambition (Energy chiefs urge quick action on carbon, *Financial Times*, 19 March 2009).

Europe Figure 3: **Do you have some carbon capture and storage (CCS) projects already operational or planned?**



Source: PricewaterhouseCoopers, *Utilities global survey 2009*

Europe Figure 4: **What potential policies or actions will have the greatest impact and provide the best energy security for Europe?**



Source: PricewaterhouseCoopers, *Utilities global survey 2009*

The power utility leaders' unprecedented joint declaration also called for a commitment to nuclear power, better co-ordination of the patchwork of national systems for subsidising renewable electricity generation and incentives for the construction of new grid connections. The latter are important to achieve true liberalisation of Europe's power markets and to help deliver greater energy security by unblocking interconnections between grid systems. The issue of energy security again came into focus with further interruptions to Europe's gas supply from Russian in early 2009.

Energy security

The issues highlighted in the joint declaration by power utility company leaders are also reflected in the actions that our survey respondents view as important in meeting energy security concerns with a more open market, greater renewable capacity and emissions trading incentives for CCS coming top of the list of developments that would have a high or very high positive impact on energy security (see Europe Figure 4). Measures such as more LNG capacity, nuclear generation and the construction of the Nabucco pipeline, which would carry gas from the Caspian region to Austria via Turkey, are seen as underpinning in their impact on energy security.

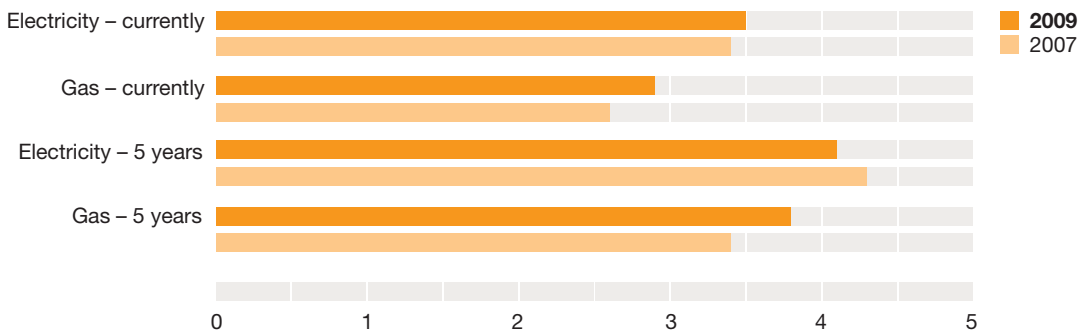
The latter has been long discussed, often in the context of competing Russian-backed pipeline proposals – Nordstream, which would bring Russian gas under the Baltic Sea, and Southstream, a gas pipeline under the Black Sea routing to Austria and Italy. The latter was given a controversial boost with the March 2009 sale by Austria's OMV of a holding in Mol, Hungary's oil and gas company, to Russia's Surgutneftegaz. The outcome and speed of development of the various pipeline proposals will have a major bearing on the extent of Europe's future dependence on Russian gas.

Market liberalisation

Many of Europe's energy policy issues are the subject of discussions by the European Parliament in spring and early summer 2009. They include resolving the long-running question of whether and to what extent companies must separate their supply businesses from national transmission networks. Calls for completer separation appear to have been dropped in return for a series of measures, including tighter regulation of the separation of management but not ownership of supply and transmission as well as various consumer-oriented measures.

However, the proposals are subject to approval by the European Parliament and time is running out before elections in June 2009. Any delay could complicate matters and leave agreement hanging in the air for some time further. Uncertainty over European energy policy is perhaps a factor in a slowing of survey respondents' expectations of how open their electricity markets will be in five years time compared with now, with respondents less optimistic than when asked the same question two years ago (see Europe Figure 5). Gas market opening is lagging behind electricity although, on gas, survey respondents were more optimistic than two years ago.

Europe Figure 5: **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 2009*

Asia

2009 is proving to be a very challenging year for power utility companies in Asia. The impact of the global economic and financial crisis is posing numerous business and operating challenges – for example, slowing growth in electricity demand versus growing generation capacities; rapidly increasing fuel, environmental compliance and other costs versus lesser-responsive tariffs. Power utility executives are seeking various means to increase operational efficiencies in the current difficult market situation. At the same time, some of the power utilities, especially those in China, continue to be confident for the future and seek growth opportunities locally and overseas to meet the expected long-term demand growth of the utilities in the region.

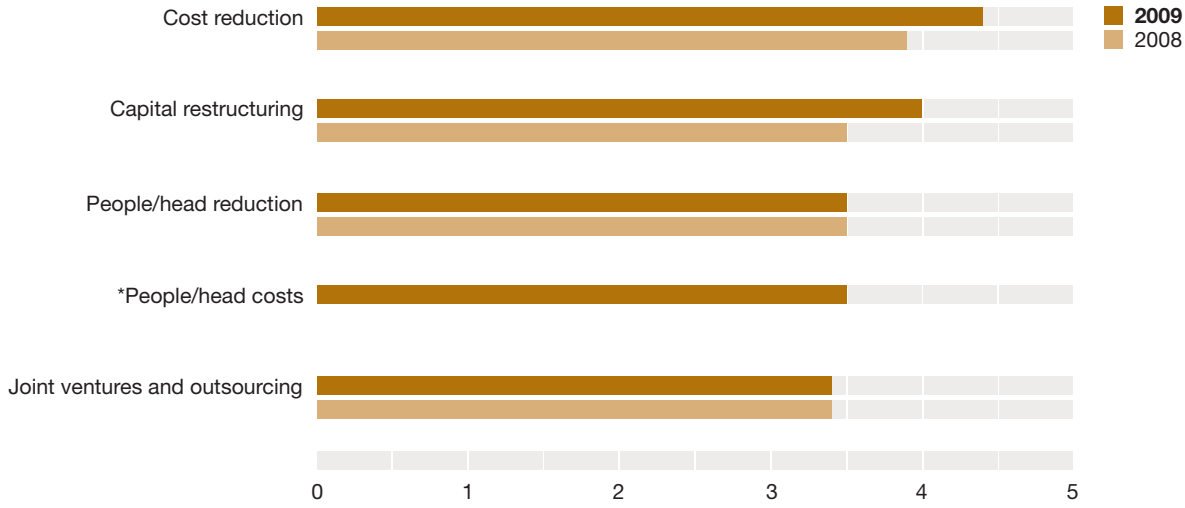
Performance improvement

Asia power utilities enjoyed strong profitability from the growth of demand for electricity during 2007, despite increasing fuel and other costs. However, in 2008, the increased capacity available and the slower growth in electricity demand, combined with the continued increase in coal costs and increased environmental compliance costs, have caused a lot of power utilities to suffer operational losses. This is particularly the case in China where the tariff received by utility companies has not been adjusted in full for the rapid increase in fuel cost.

Cost reduction and capital restructuring has become key to performance improvement in the minds of the utility company executives we surveyed. Respondents placed a stronger emphasis on cost reduction and capital restructuring in their companies than in the previous year (see Asia Figure 1). The focus on cost reduction reflects the growing competitiveness in the utility market environment across Asia. As more and more generation facilities came online as a result of expansion plans, power utility companies, particularly in China, also faced less demand, putting more pressure on the absorption of fixed costs to deliver profitability.

The need for capital restructuring stems, in part, from increasing costs and the relative slow responsiveness of tariff changes. In China, for example, although there are coal-price linkage mechanisms which allow a pass-through of any coal price increase to tariffs, the power utilities are not getting a 100% tariff pass-through. In 2008, the coal price rose significantly but the tariff was only adjusted by a fractional amount in some locations. This has been a significant issue for power utilities in maintaining profitability.

Asia Figure 1: **What is driving your company's performance improvement?**



Note: Average response. Rate where: 5 = strong driver; 1 = weak driver
*Question not asked in 2008
Source: PricewaterhouseCoopers, *Utilities global survey 2009*

Cost reduction and capital restructuring are increasingly vital

Investment

Capital restructuring may also be prompted by a quest for efficiencies and modernisation as companies seek to develop and expand in a region considered to be an attractive market with long-term strong growth potential. Per capita use of electricity is still very low compared to other developed countries. A large majority (88%) of survey respondents report that their companies are investing in new technology, both information technology and new types of generation or transmission technology (see Asia Figure 2). This investment focus also reflects the need for Asian utility companies to meet efficiencies and opportunities through more efficient management processes. The same percentage of survey respondents report that their company is also expanding beyond their domestic market with foreign investments.

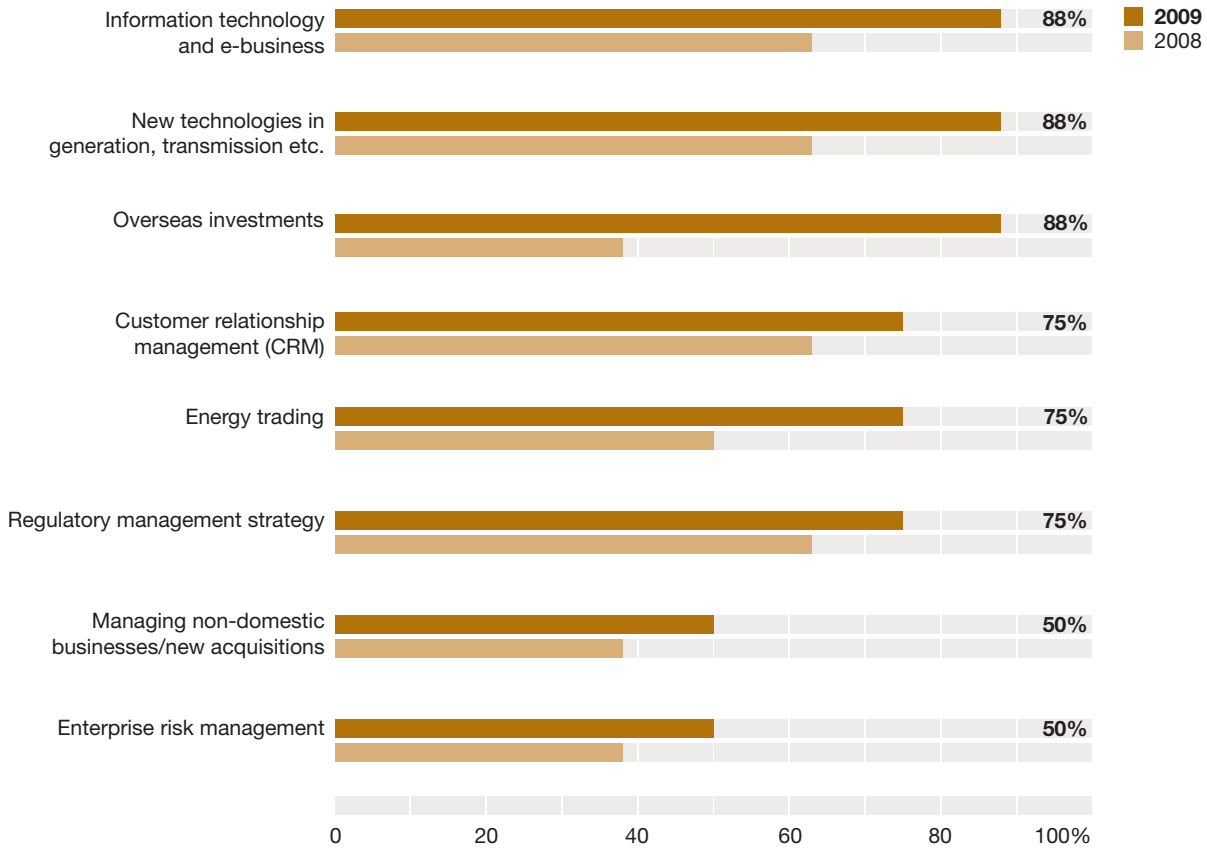
Part of this is investment in generation and transmission for nuclear and renewable energy to address the demand for cleaner generation. There is an increasing number of renewable and nuclear plants in the region. Power utilities are also investing in more technologically advanced generation facilities with 'mega generation' units being built to increase generation efficiency.

On the overseas investment front, Chinese companies are actively pursuing foreign growth opportunities. For example, Huaneng Power International, a major Chinese utility company, recently acquired Tuas Power in Singapore. Some utility companies are also moving up the supply chain to acquire coal mining assets and dilute the impact of rising coal costs.

Regulation

The regulatory environment has not changed significantly in the last few years. The different level and progress of liberalisation across the continent offers different kinds of risk and opportunities to investors of different appetite. Although the region has not seen major regulatory developments, more survey respondents believe that regulation facilitates business development (see Asia Figure 3). This apparent increasing acceptance of the importance of regulation bodes well for the development of more sophisticated power markets in the continent in the future.

Asia Figure 2: **In which areas of your business have you invested recently?**



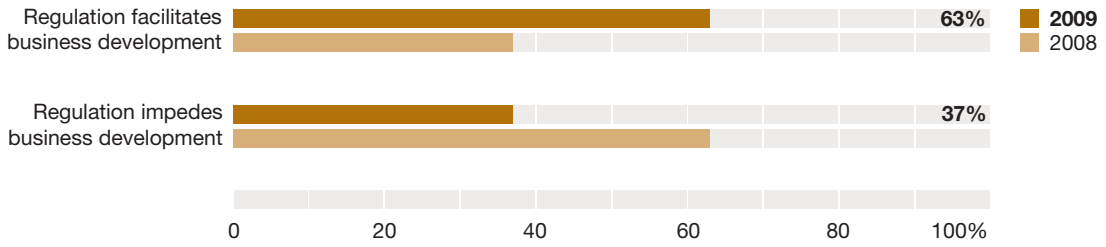
Source: PricewaterhouseCoopers, *Utilities global survey 2009*

Future challenges

Although utilities are stepping up hydro power, nuclear and renewable generation capacity, coal-fired plant continues to play a dominant role in Asian power generation. Fuel costs and tariff setting look set to continue to be a key challenge although, with a slowing or downturn in economic growth, fewer survey respondents single out fuel costs as a major challenge compared to previous years. (see Asia Figure 4)

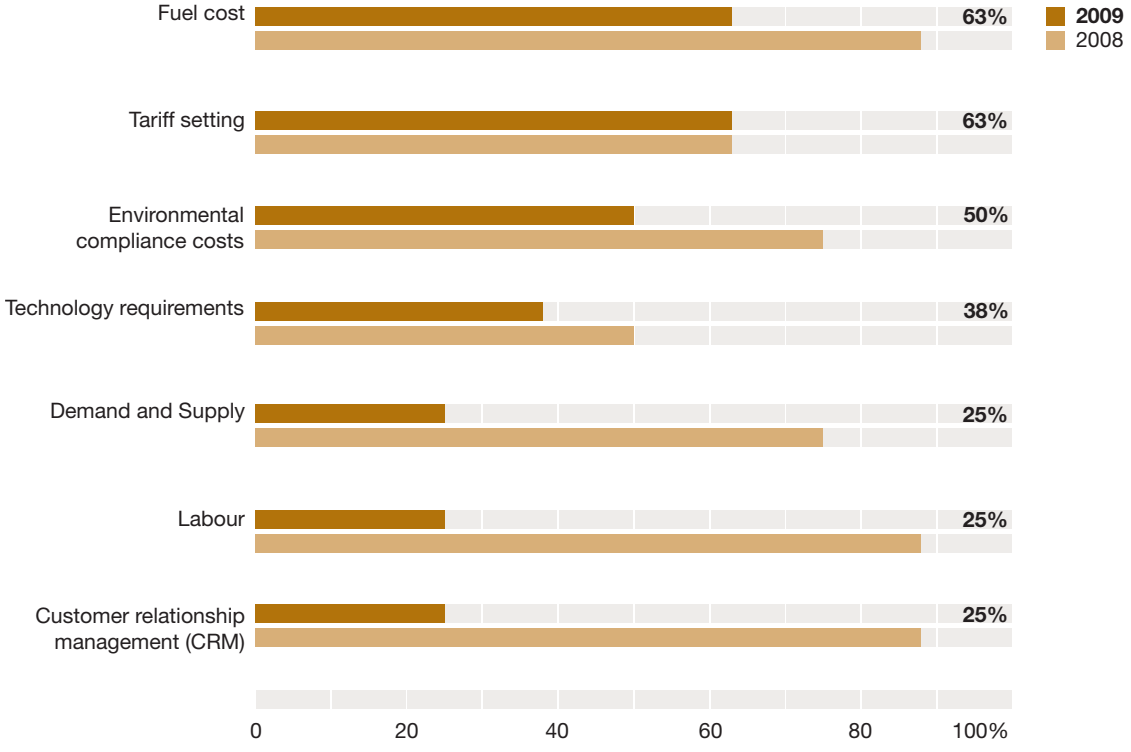
There is a need for power utilities to introduce measures for cost efficiencies in order to maintain competitiveness in the market. However, it is still necessary to have some changes to the tariff-setting mechanism to enhance long-term viability of the industry. In China, we see more and more lobbying by companies to seek change in the tariff setting mechanism. Companies are also concerned about environmental compliance costs. Environmental compliance is becoming increasingly important as more Asian countries have stepped up regulatory measures.

Asia Figure 3: **Is the nature of regulation a facilitator of business development or impediment?**



Source: PricewaterhouseCoopers, *Utilities global survey 2009*

Asia Figure 4: **What is/are the major challenge(s) to your business within the next 12 to 24 months?**



Source: PricewaterhouseCoopers, *Utilities global survey 2009*

Australia and New Zealand

The development of legislation for an emissions trading scheme, and its subsequent impact on investment in new generation and other energy infrastructure, has been a major focus for Australian utility companies. In December 2008, the Australian Government released its White Paper for the proposed Carbon Pollution Reduction Scheme (CPRS), planned to start in July 2010. This was followed by the release of the draft exposure legislation in March 2009.

Passage of the legislative package is uncertain without support from the either the opposition party or the Greens and Independent Senators of the Australian Senate. The Australian Government has also committed to extending the renewable energy target to achieve 20% of electricity supply from renewable sources by 2020. At a state level, a number of states are also driving ahead with plans to implement energy efficiency targets that apply to energy retail businesses.

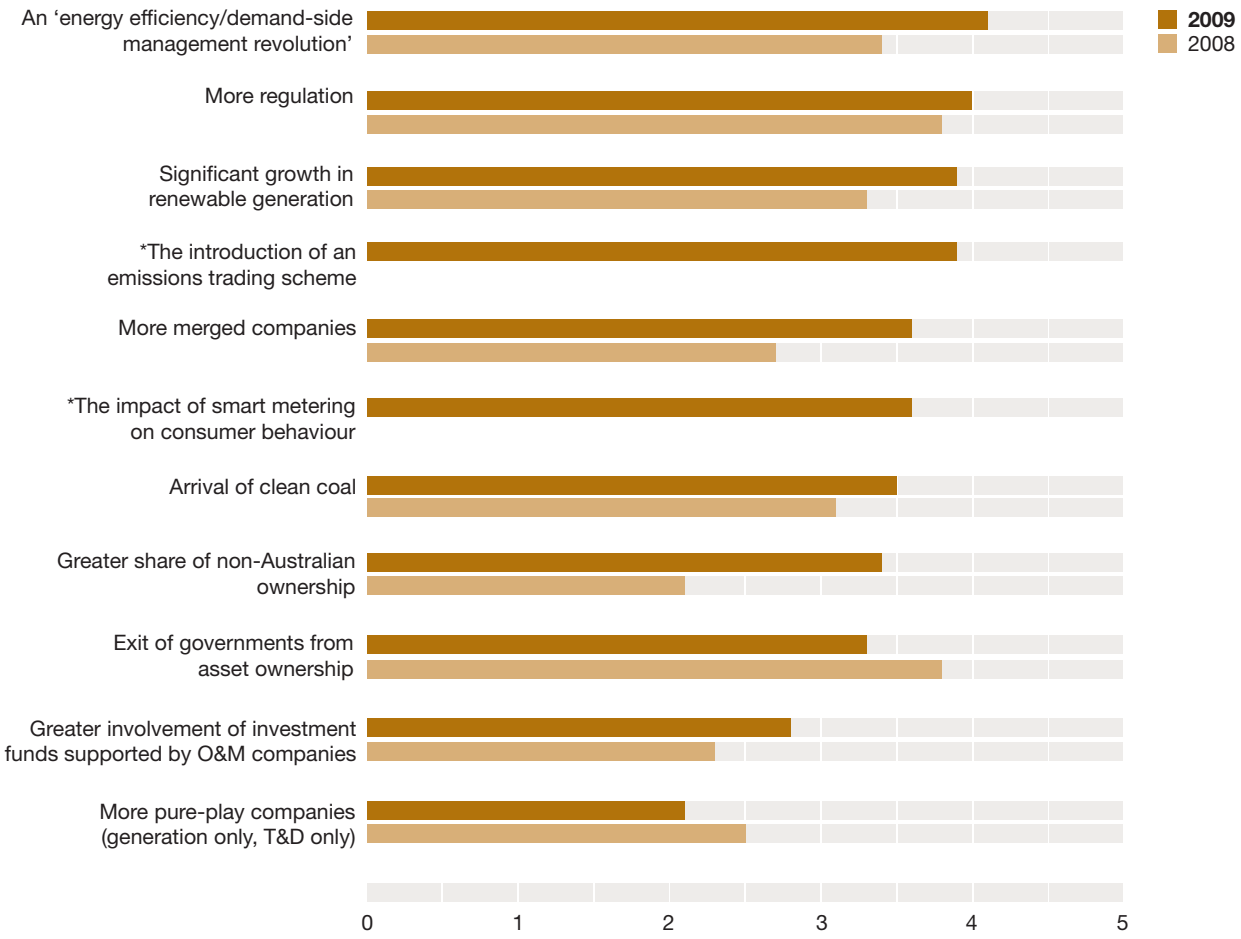
In New Zealand, energy utilities also continue to operate in an uncertain environment. Challenges include the regulatory framework for transmission and distribution services, the roles of the various regulators, uncertain introduction of carbon pricing (the new government is reviewing the implementation of the proposed emissions trading scheme), the reform of consenting processes, and changing hydrological conditions.

Regulatory uncertainty, coupled with the global financial crisis and economic downturn, are providing significant challenges for utility companies, particularly those that are undertaking very large capital programmes to reinforce electricity transmission and distribution security, as well as to bring additional generation sources on-stream. Our survey respondents also identify the potential ‘energy efficiency/demand side management revolution’ as a big change lying ahead – we discuss this later under ‘operations’.

Opportunities for growth

In Australia, there is a clear need for significant investment in energy infrastructure to meet demand growth, replace aged network assets, to transition to lower carbon-intensive generation and to create the infrastructure to prepare for growth in generation, including the likelihood of significantly more renewable and distributed generation. In New Zealand with large hydro systems dependency, investment in new generation sources to optimise security of supply is a key driver due to the inherent variability associated with existing hydro generation schemes and increasing exploitation of the country’s excellent wind generation resource. The new government has reversed the moratorium on new base-load thermal generation, providing opportunities for reassessment of thermal investments. This is tempered somewhat by the proposed imposition of carbon pricing through the CPRS for the electricity sector, which will impact on the economics of carbon intensive fuel sources.

Australia and New Zealand Figure 1: **What will be the biggest changes in the Australian and New Zealand utility industry over the next five years?**



Note: Average response. Rate where: 5 = major change; 1 = minor change
*Question not asked in 2008
Source: PricewaterhouseCoopers, *Utilities global survey 2009*

Climate change policy dominates the agenda

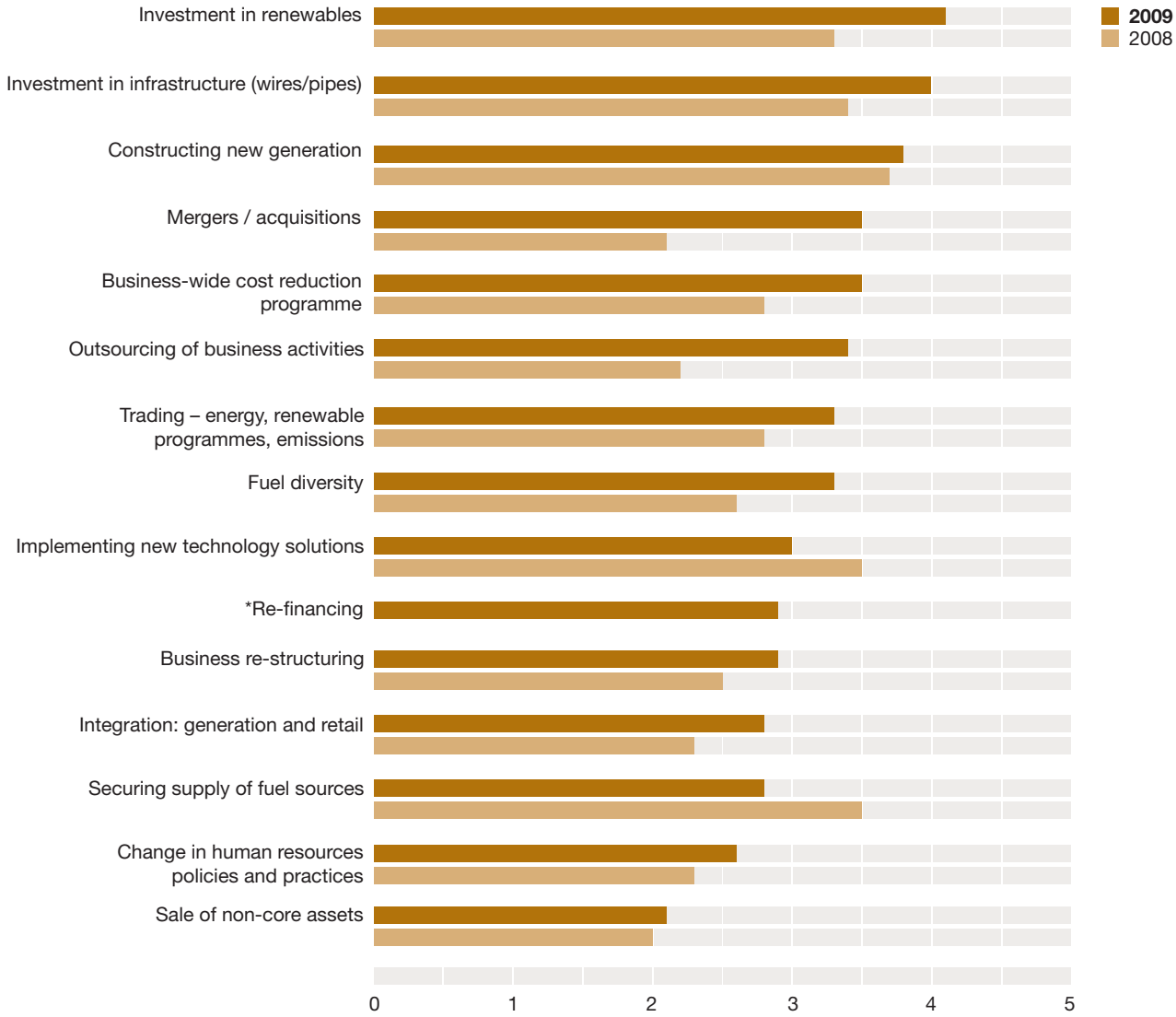
Survey respondents highlight that new capacity investments, particularly in renewable energy and grid infrastructure, will feature prominently in strategies for growth over the next 12 to 18 months (see Aus/NZ Figure 2). Grid investment is being primarily driven by load growth and major asset renewal programmes.

Those businesses with strong balance sheets will be in the best position to invest in, and profit from, an increasing demand for energy infrastructure. For others, there will be difficulty in accessing project finance and/or refinancing existing debt facilities on viable terms within the current global credit environment. In contrast to the need for more electricity infrastructure, limited liquidity in the financial markets is likely to see a growing focus on capital management and a drive for business-wide cost reductions across utility businesses as the global financial crisis continues.

Regulation

During 2008, the most significant advance in energy market reform in Australia was the passage of a new National Gas Law (NGL). This transferred responsibility for the economic regulation of natural gas transmission and distribution pipeline services from the states to the Australian Energy Market Commission (AEMC – rule making and market development) and the Australian Energy Regulator (AER- national energy regulator), except for Western Australia.

Australia and New Zealand Figure 2: **How important are the following strategic growth opportunities for your company over the next 12-18 months?**

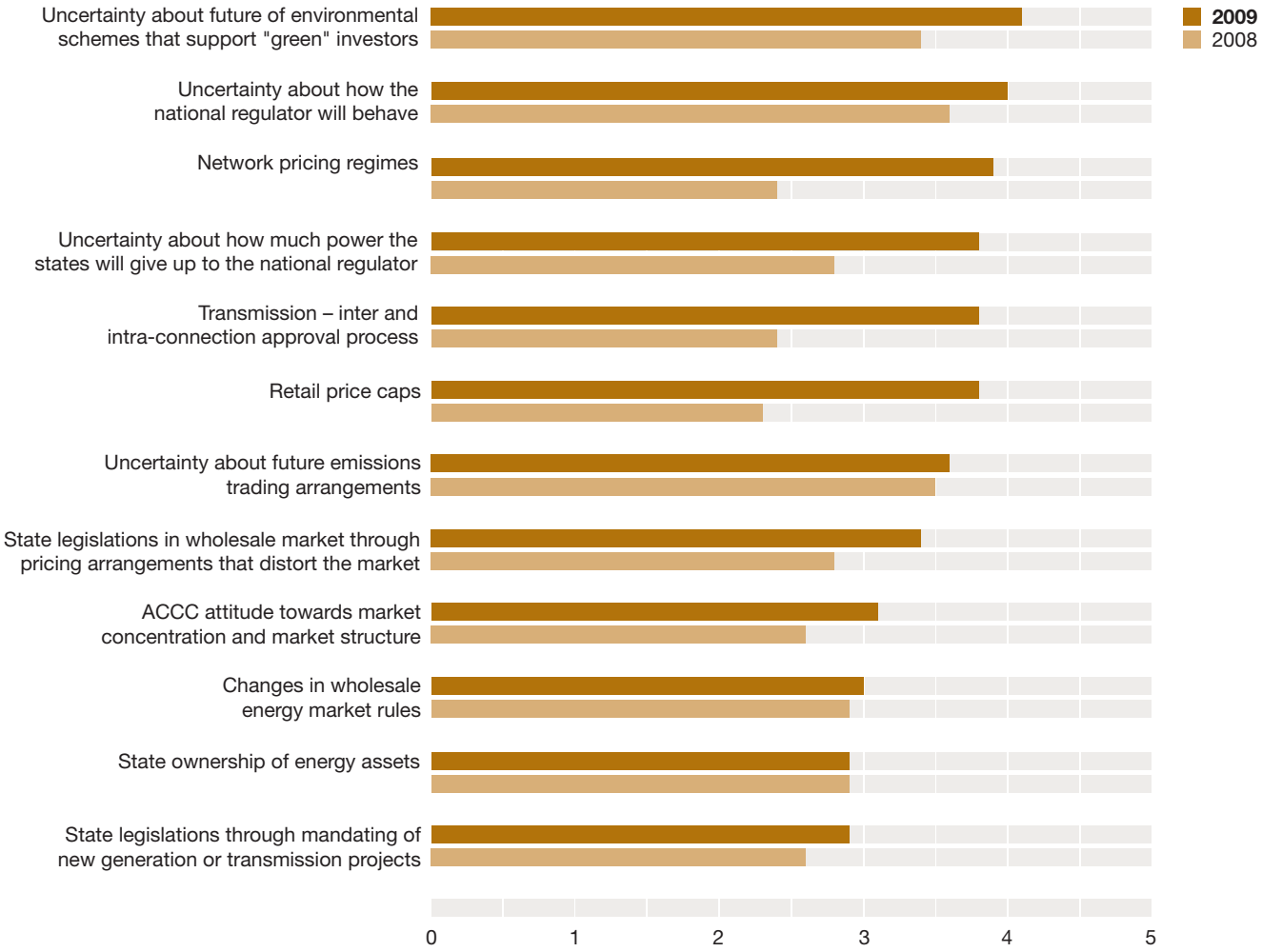


Note: Average response. Rate where: 5 = very important; 1 = not important
*Question not asked in 2008
Source: PricewaterhouseCoopers, *Utilities global survey 2009*

Despite these reforms, the survey shows perceptions among respondents that regulatory uncertainty is a major disincentive to investment in the energy sector are strengthening. Some major developments that have contributed to this are:

- Continued uncertainty over the timing of the introduction of emissions trading.
- A draft decision by the AER to reduce weighted average cost of capital that will be applied to future regulatory revenue determinations for electricity distribution network assets.
- A delay until 2011 in the implementation of a national energy consumer framework (eg a code of conduct for electricity and gas retailers). This has resulted in energy retailers having to continue to operate customer retail processes with different rules in each state.
- A reluctance of the South Australia and the Australian Capital Territory governments to deregulate electricity retail prices despite independent regulators' recommendations to do so.
- Increases in regulatory costs as Victoria, South Australia, and New South Wales have imposed different energy efficiency schemes on electricity retailers instead of one national scheme.

Australia and New Zealand Figure 3: **Which aspects of regulatory uncertainty provide the greatest disincentive to investment in the energy and utilities sector?**



Note: Average response. Rate where: 5 = major impact; 1 = no impact
Source: PricewaterhouseCoopers, *Utilities global survey 2009*

In New Zealand, the same trends are evident with an increasingly uncertain regulatory environment which is requiring additional management focus and resources and unnecessary costs. In particular, the proposed New Zealand Emissions Trading Scheme (which is currently under review) and transmission and distribution price and quality regulation processes have both led to investment delays. Reviews of the functions and the status of the market regulator, the Electricity Commission, and the economic regulator, the Commerce Commission, are ongoing. In addition, the Commerce Commission's pending report on the levels of competition in the electricity generation and retail sectors is increasing uncertainty for industry participants.

Operations – the impact of advance interval meters

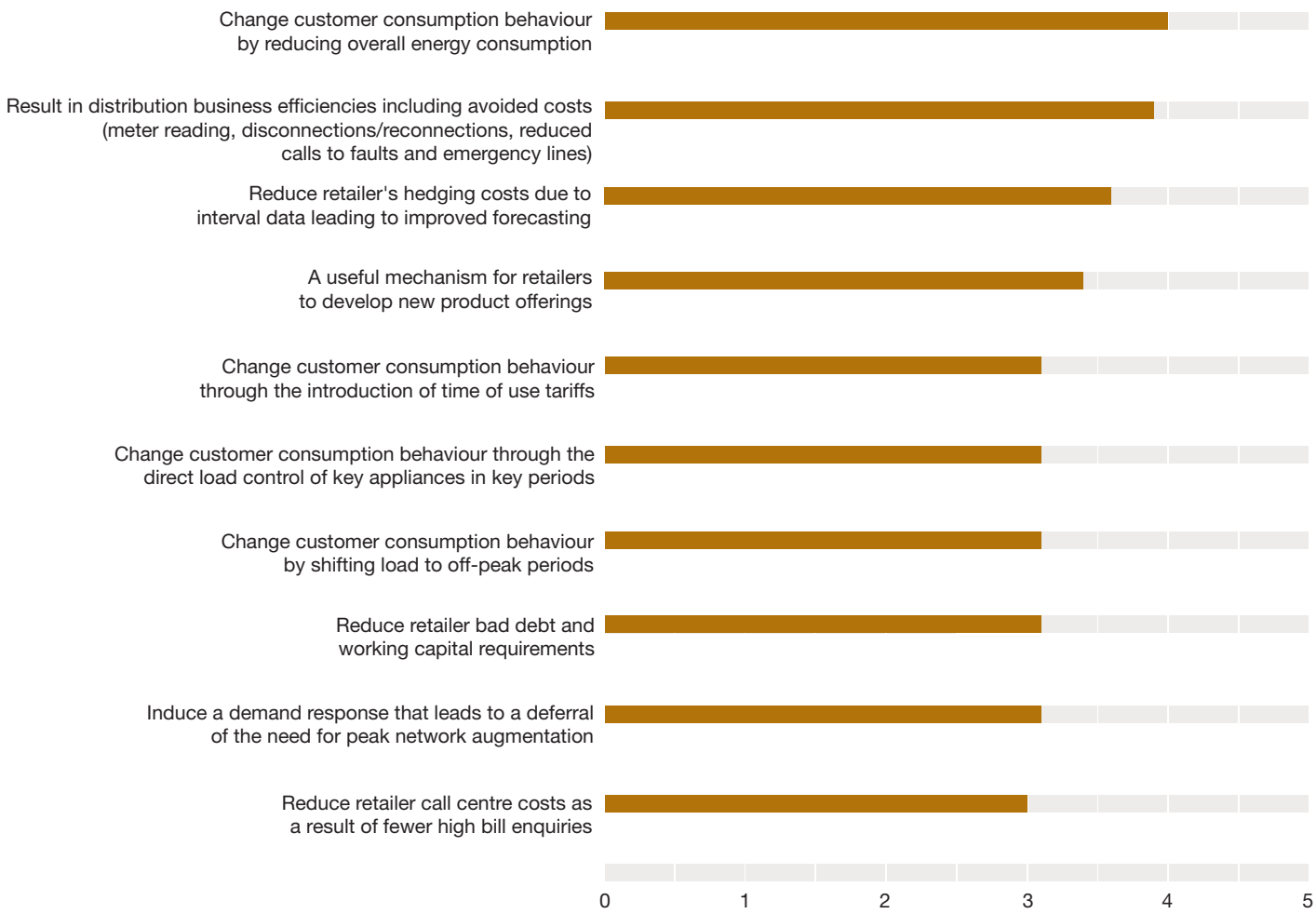
Following the completion of a national cost benefit analysis, the Ministerial Council on Energy (MCE), in June 2008, re-affirmed a commitment to a roll-out of electricity smart meters in state jurisdictions where benefits outweigh costs. The provision of smart meters is expected to enable consumers to make more informed choices and better manage their electricity use and greenhouse gas emissions. This can reduce demand for peak power with potential infrastructure savings, and drive efficiency and innovation in electricity business operations and retail market competition.

The survey results indicate that a focus on energy efficiency and demand management will be one of the biggest areas of change in the next five years (see Aus/NZ Figure 1). Survey respondents are also optimistic that a range of operational efficiencies and customer behaviour changes will flow from smart metering (see Aus/NZ Figure 4). However, there is still uncertainty and risk regarding the net benefits of advanced interval meters by distributors and retailers. In Australia, the separation of retail and distribution creates a split benefits problem. This has necessitated the Victorian Government to mandate the rollout of smart meters by electricity distributors to small customers by December 2013.

Other jurisdictions are expected to review their position in June 2012 after the regulatory framework for smart meters is completed and pilots and trials have been conducted to confirm the technology. In New Zealand, the roll out of smart meters is not mandated by government but is gaining momentum, as retail and network owners seek to exploit the opportunities from more effective measurement and management of demand by customers, and related investment reduction.

Optimism about smart metering

Australia and New Zealand Figure 4: **What affect will advanced interval meters have?**



Note: Average response. Rate where: 5 = major affect; 1 = no affect
Source: PricewaterhouseCoopers, *Utilities global survey 2009*

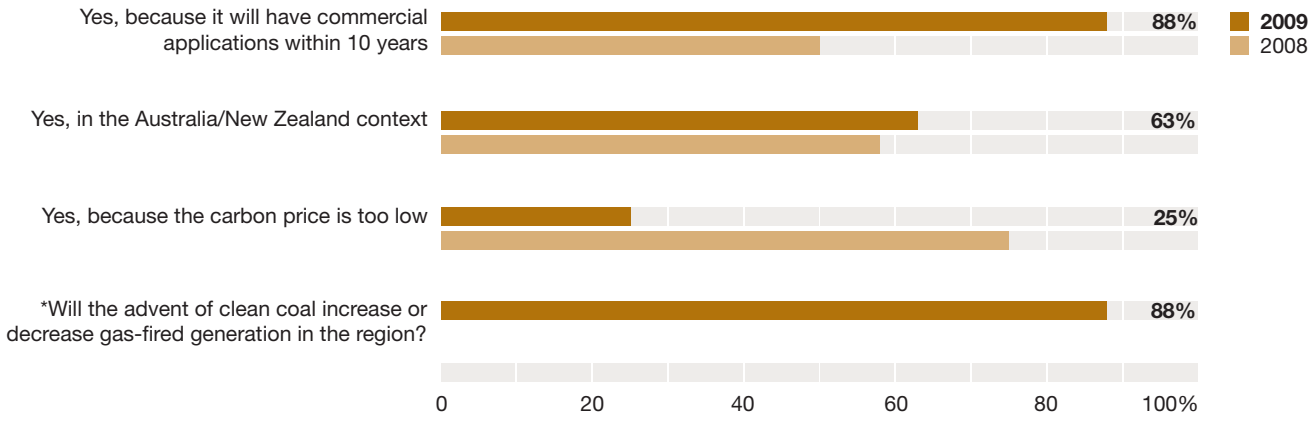
Big potential for energy demand side management revolution

Operations – clean coal technology

The extent and pace of development of clean coal technology remains uncertain and many players inside and outside the utility sector remain sceptical about its development. Survey respondents from Australia and New Zealand share this scepticism and highlight the importance of economic incentives coming through the price of carbon to spur the technology. However, there has been a significant year on year shift in respondents' positive outlook on clean coal. Progress on an emissions trading scheme has led more to believe a carbon price signal may become effective and an overwhelming majority (88%) consider that clean coal technology will have commercial applications within the next ten years (see Aus/NZ Figure 5).

Given the prevalence of operational coal mines and known coal reserves, this technology is in receipt of substantial Australian Government support. The Aus$500m National Clean Coal Fund is one example of this. However, respondents' optimism should be tempered by the lack of emergence of any viable pilot, let alone a commercial project, and the potential short fall between the cost of CCS technology and expected carbon prices.

Australia and New Zealand Figure 5: **Do you agree with the global scepticism about the reality of clean coal technology being available in the near future?**



Note: Average response. % share of response
*Question not asked in 2008
Source: PricewaterhouseCoopers, *Utilities global survey 2009*

Economic spur needed if carbon capture is to become real

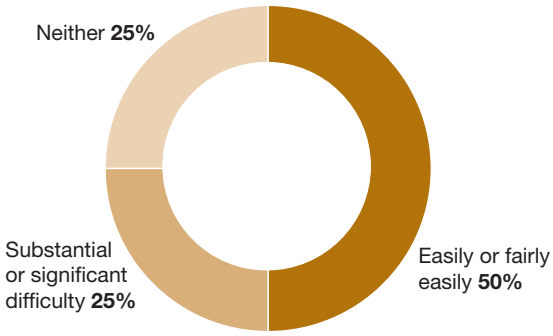
Managing risks – the focus is on carbon

Many utility businesses in Australia and New Zealand have started to adapt their strategies and operations to position themselves for a carbon constrained future. Companies have responded at different times and to varying degrees, with many waiting for more certainty on emissions trading before fully committing to large investment decisions. All three of the major vertically integrated 'gentailer' businesses in Australia have been active in looking to secure access to low carbon electricity generation and a number of generators are assessing capital projects to increase the efficiency of their plant, develop renewable energy sources or progress 'clean coal' solutions.

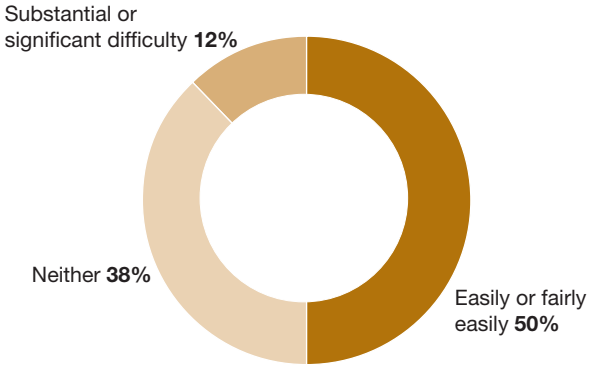
However, at the time of writing, new capital intensive energy projects are struggling to raise project finance and this is likely to have as much to do with uncertainty around the future price of carbon as it has with the current state of the capital markets. Across the board, many survey respondents indicate cautious optimism that they can fully assess and manage the risks, identify opportunities, and manage stakeholder expectations regarding managing risks (see Aus/NZ Figure 6).

Australia and New Zealand Figure 6: **The forthcoming Carbon Pollution Reduction Scheme will have financial implications for both carbon intensive and non-carbon intensive businesses – How will your management respond?**

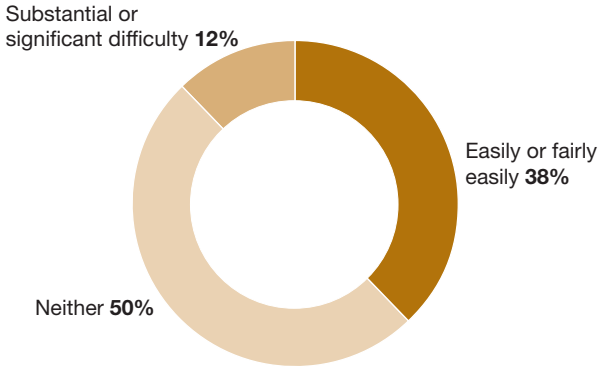
Articulate and quantify the specific risks and opportunities associated with the Carbon Pollution Reduction Scheme



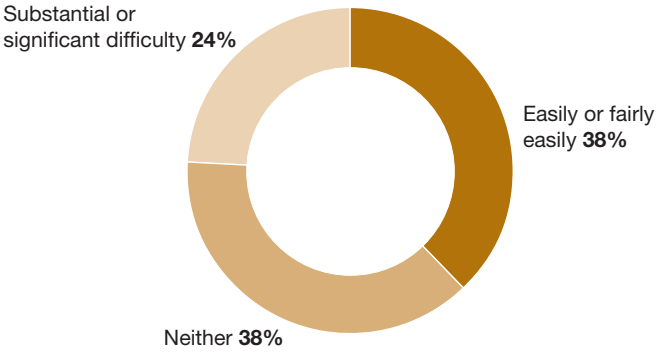
Translate these risks into clear financial and commercial solutions for your business



Demonstrate that you have corporate structures in place to deal with these changes



Advise your stakeholders on your short, medium and long-term carbon and sustainability reporting mechanisms



Note: Average responses only. % share of respondents
Source: PricewaterhouseCoopers, *Utilities global survey 2009*

Middle East

Growing demand for electricity, and the impact of an inadequate physical and financial infrastructure, means that the region's developing markets have enormous long-term potential for power developers. There are high expectations for project activity in the water and power sector in 2009. However, the progress on major contracts tendered in 2008 will depend on the health of the project finance market in 2009 with banks growing increasingly risk averse and selective about which projects they back. Moreover, the economic slowdown has led to reduced power and water demand expectations in some parts of the region as planned residential and business developments have been put on hold.

Priorities for the sector

The majority of those questioned stated that satisfying demand was the top priority for their organisations followed by meeting the high capital requirements involved in expansion and refurbishment of water and power facilities. In Saudi Arabia, for example, one of the region's most populous countries, power consumption is increasing by an average of 7% per annum and water usage is rising by about 3%. Electricity demand is forecast to climb to more than 60,000MW by 2025, from about 38,000MW today and demand for desalinated water is expected to nearly double from the current level of 800 million gallons a day.

Expansion plans in Saudi Arabia and other countries in the region have been hit hard by the loss of liquidity in the financial sector. The total value of the eight power and water projects in the Gulf seeking financing in 2009 is US$18.3bn whereas the value of the only major independent water and power project financing to close in 2008 was US$3.5bn.

Abu Dhabi has led the Gulf in encouraging greater private sector participation in utility projects, with the implementation of five independent water and power projects (IWPP) in recent years.

However, the strained bank lending market has thrown into question the viability of the independent power project (IPP) and IWPP models, and Abu Dhabi is now preparing to turn its privatisation strategy on its head and fund projects publicly. This strategy is expected to be implemented by governments throughout the region who will not want to allow delays on any power and water projects that could have a negative effect on their economies. The estimated surplus of US$342bn in the Gulf Cooperation Council's (GCC) current account would enable the governments to fund these projects themselves if project financing cannot be obtained in time.

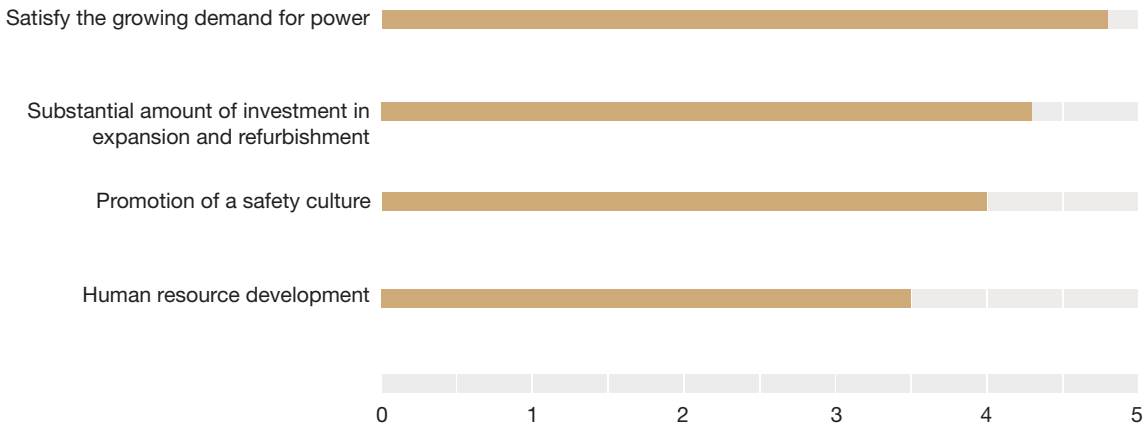
Alternative sustainable energy sources

While environmental concerns have prompted interest in 'green' energy schemes elsewhere in the world, they are not the main driver in the Middle East. In a region that has to date relied exclusively on oil and gas as feedstock for its power plants, renewable resources provide a way to diversify away from hydrocarbons and are a welcome means of increasing energy security. But while it is possible to argue in favour of alternative energy projects on the grounds that oil and gas reserves will eventually run out, this is not a pressing concern because the structure of the market in the region means they do not have enough gas to fire their power plants.

In this context, survey respondents gave stronger scores to pipelined gas, followed by liquefied natural gas (LNG), as the 'alternative' energy source likely to have the most significant effect on competitive electricity pricing among alternative energy sources. Renewable energy sources like wind, bio-energy and nuclear power were not rated much in importance, although solar power ranked higher than the other renewable sources.

Producers have no incentive to sell their gas on the domestic market when they can secure much higher prices on export. But local utilities, accustomed to heavily subsidised prices for feedstock, are unwilling to pay international prices so alternative energy projects are increasingly attractive and, for as long as global prices remain high, that will remain the case. The Gulf plans to build power plants with an additional capacity of 78,800MW by 2015. The majority of these plants will primarily burn gas, and to some degree oil, but it is clear that decision makers in the region are becoming increasingly aware of the need to diversify their energy sources. The Egyptian Electricity Holding Company, for example, is planning to develop facilities to supply 4,000MW of nuclear power and 5,980MW of wind power under its expansion plan for the years 2013-27.

Middle East Figure 1: **What are the priorities for the sector?**



Note: Average response. Rate where: 5 = high priority; 1 = low priority
Source: PricewaterhouseCoopers, *Utilities global survey 2009*

Renewables remain low priority in a hydrocarbon rich region

Recent investments

The main focus for recent investment by companies has been new technologies in generation, transmission, and information technology with three quarters of survey respondents stating that they had invested in these areas. However, in contrast to expectations, some of the Middle East's electricity and water utilities now face the prospect of having over-invested in capacity. The impact of the global economic slump means that many of the region's largest real estate projects are being shelved and many expatriates are leaving. This in turn translates into less need for new power and water supplies over the medium term.

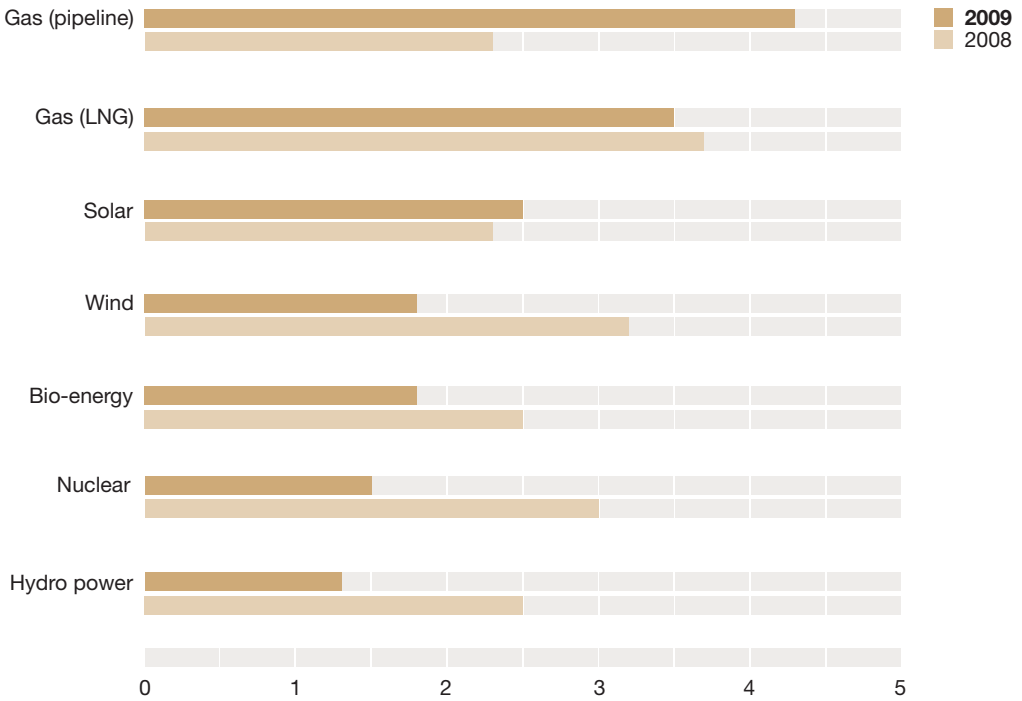
The demand picture is not the same across the six GCC states. Saudi Arabia is not expected to experience a significant downturn in power and water demand, although uncertainty over the kingdom's industrial sector means this outlook could change. In other gulf states, some of the largest real estate projects have been delayed which combined would have been capable of accommodating a large number of residents. The delays will have an impact on the utilities' capacity requirements and investment plans.

Future investments

The majority of those questioned felt that private foreign investors, multilateral funding agencies and domestic and foreign investors and commercial banks would fund future investments in the utility sector. Half were of the opinion that governments, capital markets and public debt would also prove to be a source of investment funding.

However, contrary to the expectations voiced when the credit crisis first manifested itself in the Middle East late last year, banks are proving reluctant to take on large, long-term financing deals even for government-backed infrastructure projects. As a result, developers are struggling to secure funding for power and water projects. The lack of activity in the project finance markets has raised concerns over the prospects for securing credit for other power and water schemes in the region, prompting regulators to examine alternative financing options to ensure that plans can move ahead on schedule. Government support, therefore, is likely to play a significant role.

Middle East Figure 2: **Which of the following alternative sustainable energy sources do you believe will affect competitive electricity pricing in your region in the near future?**



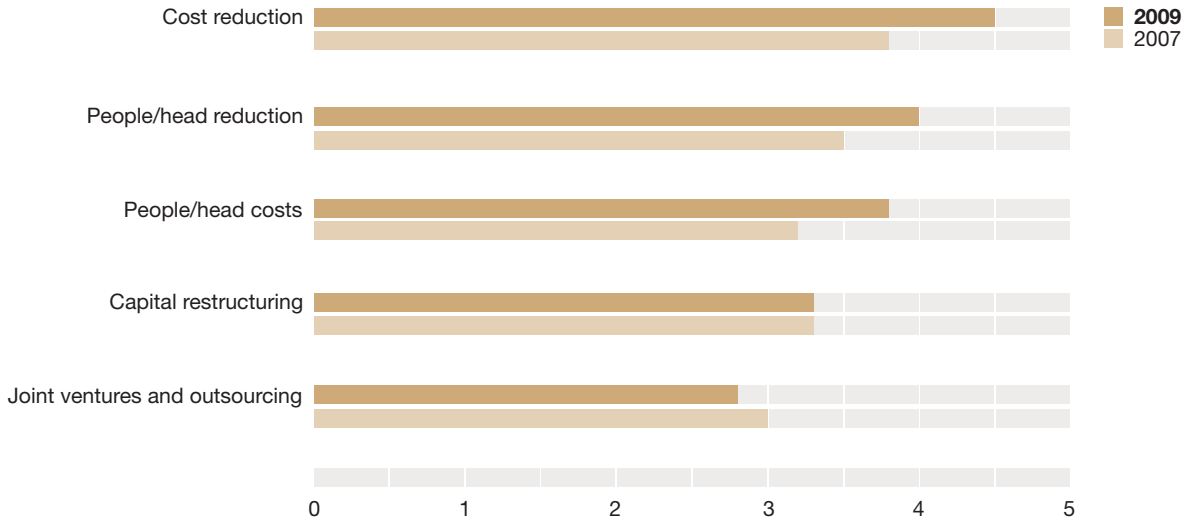
Note: Average response. Rate where: 5 = high focus; 1 = no focus
Source: PricewaterhouseCoopers, *Utilities global survey 2009*

Performance improvement

Cost reduction and reduction of human capital were identified as the key factors driving utility performance improvement (see Middle East Figure 3). The importance of capital restructuring was also stressed by survey respondents. In Saudi Arabia, for example, the Saudi Electricity Company (SEC) has been developing plans to improve efficiency and performance with changes already afoot. In March 2008, it issued a tender for its first ever independent power project (IPP), to be located at Rabigh.

The next step was to improve project procurement. Instead of tendering engineering, procurement and construction projects individually, SEC has started to bundle them into groups to attract the biggest contractors and increase competition. It has also begun buying materials in bulk. The company is also working on improving the efficiency of its workforce. In 2008, almost 800 people had accepted redundancy packages and were to be replaced with new employees in a restructured and reduced workforce with lower costs per employee.

Middle East Figure 3: **What is driving utility performance improvement?**



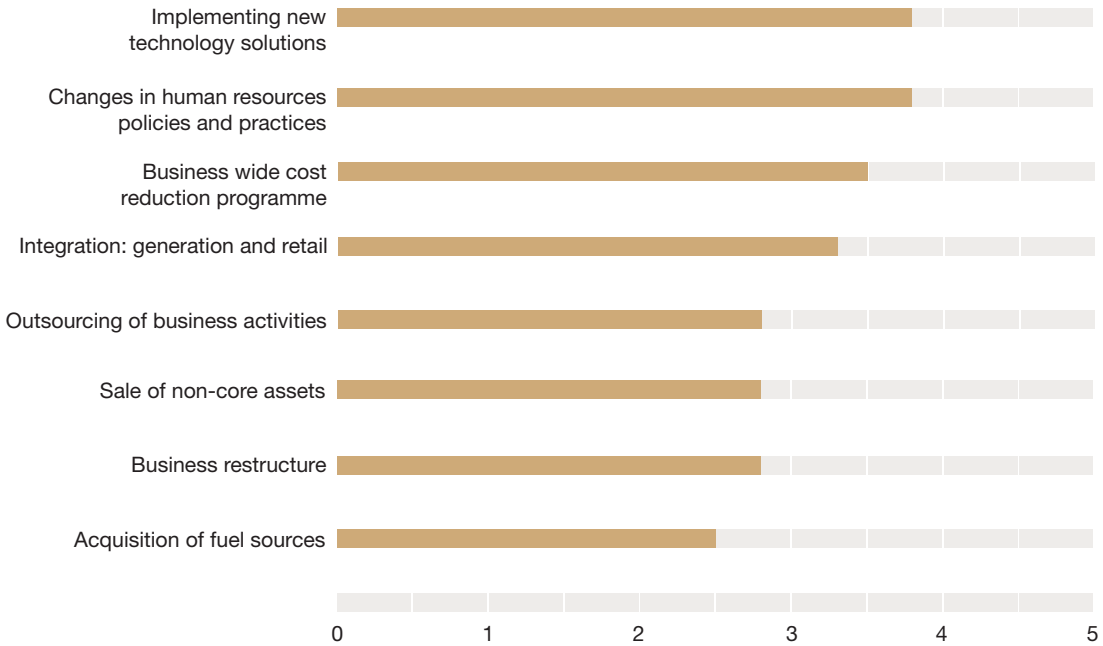
Note: Average response. Rate where: 5 = very important; 1 = not important
Source: PricewaterhouseCoopers, *Utilities global survey 2009*

Cost reduction key to performance gains

Future priorities

Looking ahead over the next two years, companies are prioritising the implementation of new technology solutions and changes in human resources policies and practices followed by business wide cost reduction strategies (see Middle East Figure 4). The interruption in explosive demand growth presents an opportunity for some utilities to widen their supply options. New technologies, such as floating desalination, are beginning to take hold, as illustrated by the SEC's barge-mounted desalination units in Shuaibah. The start-up of the first phase of the Shuaibah IWPP in February 2009 has increased supplies to Jeddah by 200,000 cm/d. A further 150,000 cm/d of capacity has also come on stream following the extension of the original Shuaibah desalination plant. The SEC is also among the major utility sector players to be implementing a business wide cost reduction plan.

Middle East Figure 4: **How important will the following activities be for your company over the next 12 - 24 months?**



Note: Average response. Rate where: 5 = very important; 1 = not important
Source: PricewaterhouseCoopers, *Utilities global survey 2009*

Central, East and West Africa

The African power industry is an investment hotspot. Governments, utility players and other stakeholders all have a 'build, build, build' mentality as they look to satisfy the region's rapidly increasing demand for electricity. However, as the ripples from the international financial crisis reach the region and investors become increasingly risk averse, the industry needs to take bold steps to attract the required investment inflows.

Growth and investment

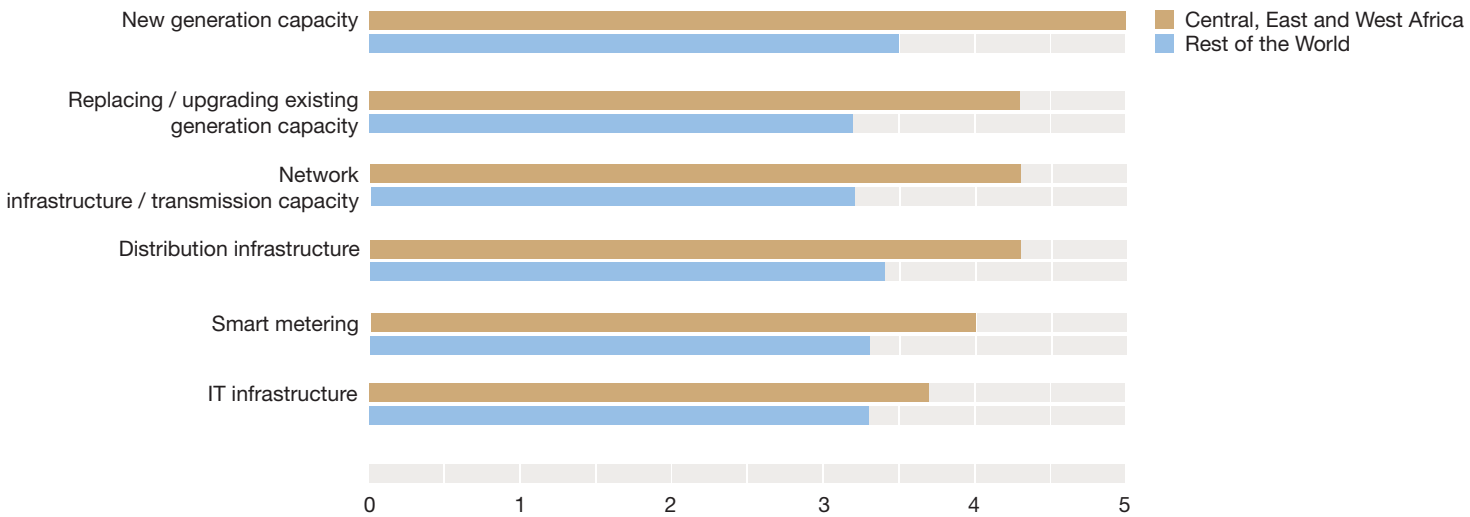
Market reforms in the Central, East and West African power sector have had varied levels of success to date. There has been some success in putting power entities onto a sounder financial footing. However, poor capacity utilisation, inefficient procurement of fuel and spare parts, deficient maintenance, as well as high transmission and distribution losses, are still major issues. Independent Power Projects (IPPs) were considered a key part of this reform programme but, in a number of cases, state utilities have remained vertically integrated and maintained a dominant share of the generation market, with private power playing on the fringes.

Governments and utilities are actively pursuing new investment to drive improvements and greater private sector participation. As Africa Figure 1 shows, senior utility company executives in Central, East and West Africa were all expecting to make large investments in new generation capacity compared to 58% of all survey respondents.

This is driven in part by the substantial African infrastructure deficit. Electricity coverage in sub-Saharan countries is only 61% of that of other low income countries and generation capacity is only 88% (Foster, September 2008, Africa Infrastructure Country Diagnostic project).

Despite continued support from concessionary sources for power projects, this will ultimately be insufficient to meet the planned investments. There is strong recognition of the role that needs to be played by private finance. However, like their counterparts elsewhere, the current economic downturn and financial crisis has led survey respondents in the region to be concerned about the impact of a shortage of capital for infrastructure projects.

Africa Figure 1: **What is the driver of your growth strategy?**
Organic growth – where are you looking to make new investments?



Note: Average response. Rate where: 5 = large investment; 1 = little or no investment
Source: PricewaterhouseCoopers, *Utilities global survey 2009*

Nonetheless, foreign direct invesment in Africa has continued to grow steadily since the 1990s and the World Bank has indicated that it will take active steps to provide liquidity support. Private sector involvement in the energy sector has continued to trend upwards over the last decade – with a high watermark reached in 2005 (see Africa Figure 2). While some traditional sponsors may withdraw from developing countries, investors and sovereign funds from Asia and the Middle East are becoming increasingly active.

Arguably, the more pressing constraints on capital come from within. Despite over a decade of experience since the African reform process began to unfold, project structuring is still not following a 'cookie cutter' approach – whereby standard processes and documents are used from policy setting down to procurement. This has driven up the complexity of transactions and, anecdotally, had a negative impact on the number of successful financial closings. The market has also raised concerns about the approach to economic and non-economic infrastructure. Some governments have chosen to develop the economic infrastructure themselves and are trying to send the non-economic infrastructure to the private sector.

Traditionally, greenfield generation is seen as the most attractive economic infrastructure – particularly where power purchase agreements (PPAs) are in place. Distribution can attract investment if more focus is put on commercial viability. The key measure to have in place is enforceability of contracts, but better collection ratios and targeted subsidisation would also help.

Reliability of fuel supply

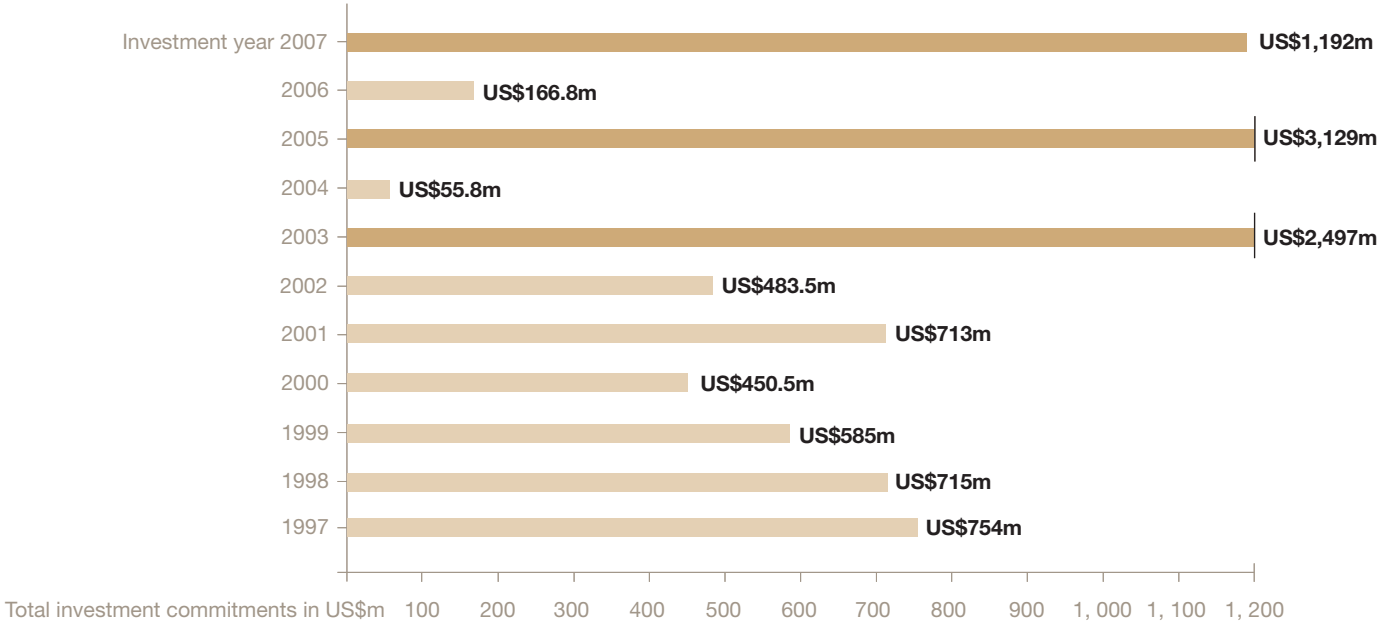
Even in oil and gas-rich West African countries, there are problems with reliable fuel supply. For African utilities, improvements in procurement and contracting are key ways in which they intend to respond to upstream fuel challenges over the next five years and, again, survey respondents in the region are focusing on these even more than their global counterparts (see Africa Figure 3).

The world economic crisis could provide a silver lining, with fuel and commodity costs likely to soften over the short term. But the downside is that there is likely to be a harder squeeze on capital required for expansion and rehabilitation. However, these trends should not mask the more fundamental improvements in procurement that need to take place to address inefficiency, as well as the lack of consistent and structured procurement strategies. Institutions that are not leveraging off current best practice models in procurement will find themselves even further behind the curve.

Performance improvement

Again, reflecting the ground to be gained, Central, East and West African survey respondents see much more potential for operational performance improvement right across the board compared to their global counterparts, particularly in the fields of supply chain and logistics, asset management and finance operations (see Africa Figure 4).

Africa Figure 2: **Total investment commitments in Sub-Saharan Africa energy sector**

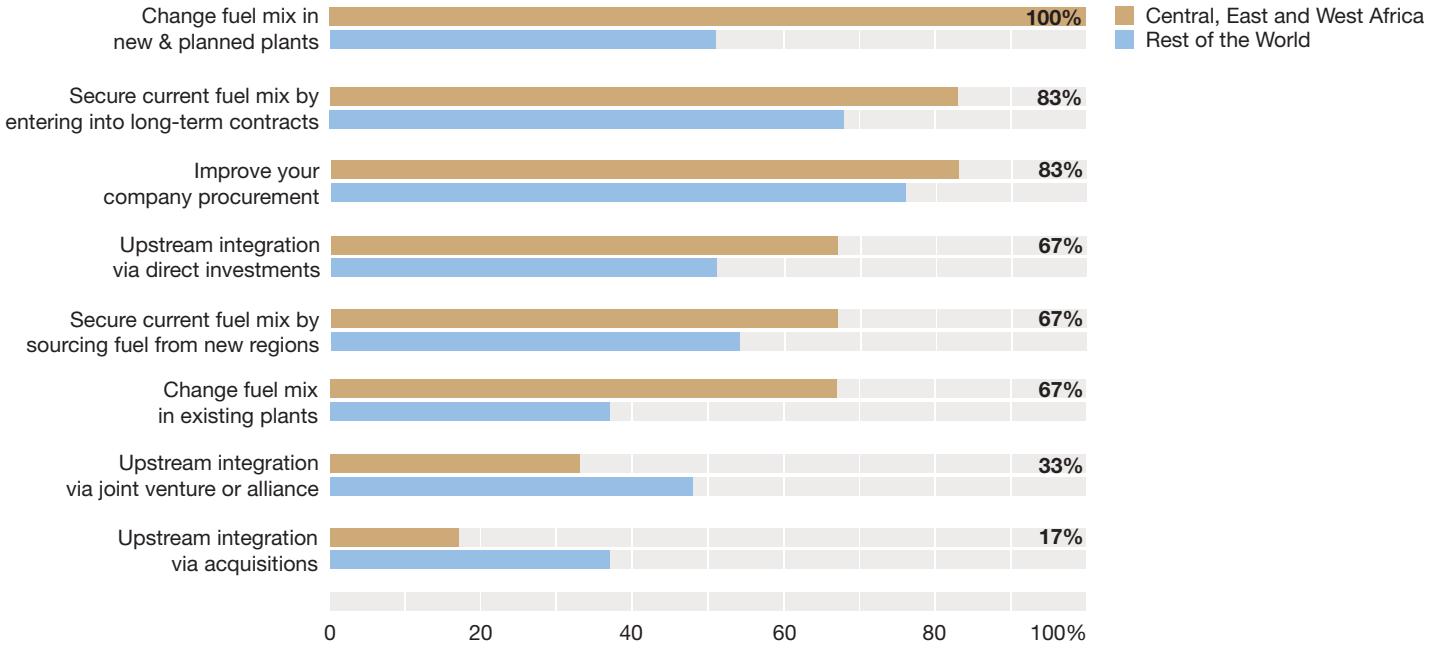


Source: World Bank and PPIAF, *PPI Project Database*. (http://ppi.worldbank.org),*18 April, 2009*

African utilities face a paradox around their supply chain and logistics. Many have to run open tender processes across the value chain. When key parts do breakdown, then there can be supply interruptions while time is taken to source parts through the open process.

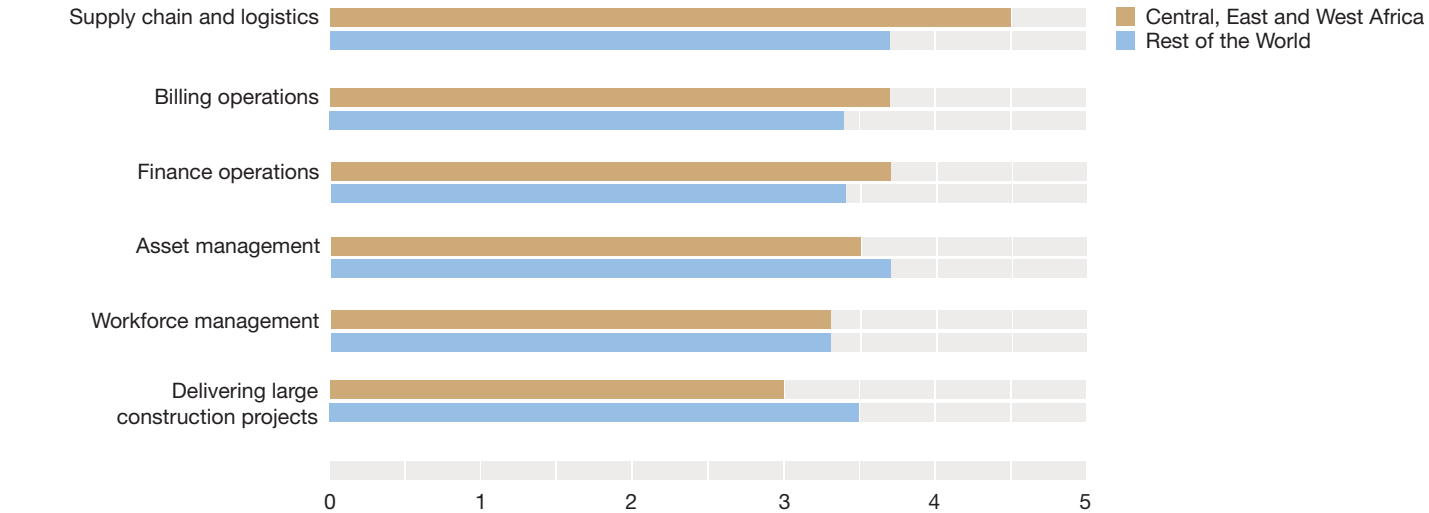
The result is that some utilities are holding a significant inventory of spares – some of which are not scheduled to be replaced in the next decade. The implications of holding this amount of inventory are even more negative in the current environment, as most institutions need to free up working capital.

Africa Figure 3: **How are you responding to upstream (fuel) challenges now & in the next 5 years?**



Source: PricewaterhouseCoopers, *Utilities global survey 2009*

Africa Figure 4: **How much potential for operational performance improvement do you see in the following areas:**



Note: Average response. Rate where: 5 = high potential; 1 = low potential
Source: PricewaterhouseCoopers, *Utilities global survey 2009*

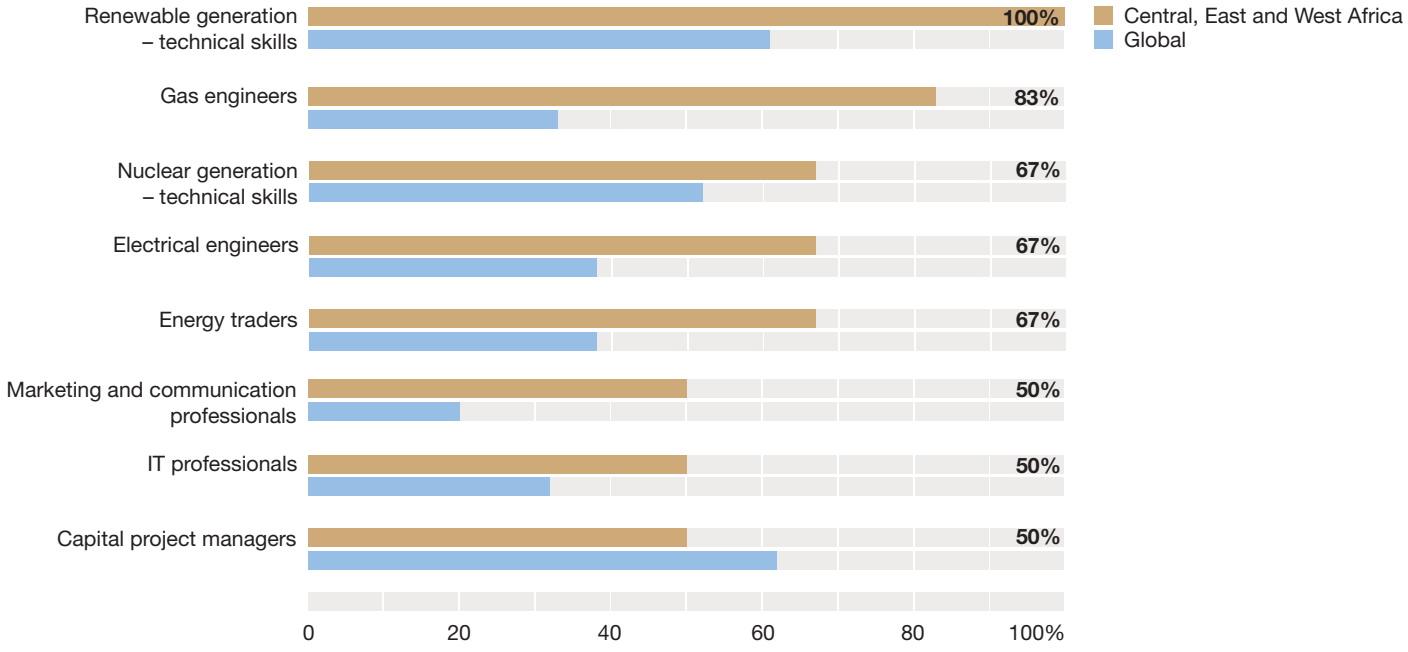
Exacerbating these challenges is the fact that Central, East and West Africa is identified as having a skills shortage that is above the global aggregate (see Africa Figure 5). The shortages are seen as particularly severe in the operational and maintenance areas. However, in the area of capital project management, only half of the region's respondents report a shortage of capital project managers. This may underestimate the sector-wide picture with PricewaterhouseCoopers' firms in the region anecdotally reporting utility company sector shortages in business and project development, technical and economic feasibility capability and, finally, in project managers who can deliver on time and on budget.

New generation

African utilities are far more likely to be changing the generation fuel mix in new and planned plants than their counterparts in the rest of the world. All of the African survey respondents we spoke to indicated a likely change in this area – compared to the global aggregate of just 55%. The region's respondents also think it is highly likely that there will be greater demand for alternative energy resources.

Gas is a pressing investment driver in Africa. This is especially the case in West Africa, with the growth of natural gas-fired power plants in Nigeria and Ghana – as well as the development of the West African Gas Pipeline Project. This will transport Nigerian natural gas to Benin, Togo and Ghana, with a potential extension to Cote d'Ivoire and Senegal. In East Africa, Tanzania has substantially invested in gas and is looking to drive up capacity in this area. Meanwhile, Kenya is doing likewise in geothermal.

Africa Figure 5: **In which sectors do you have a skill shortage?**



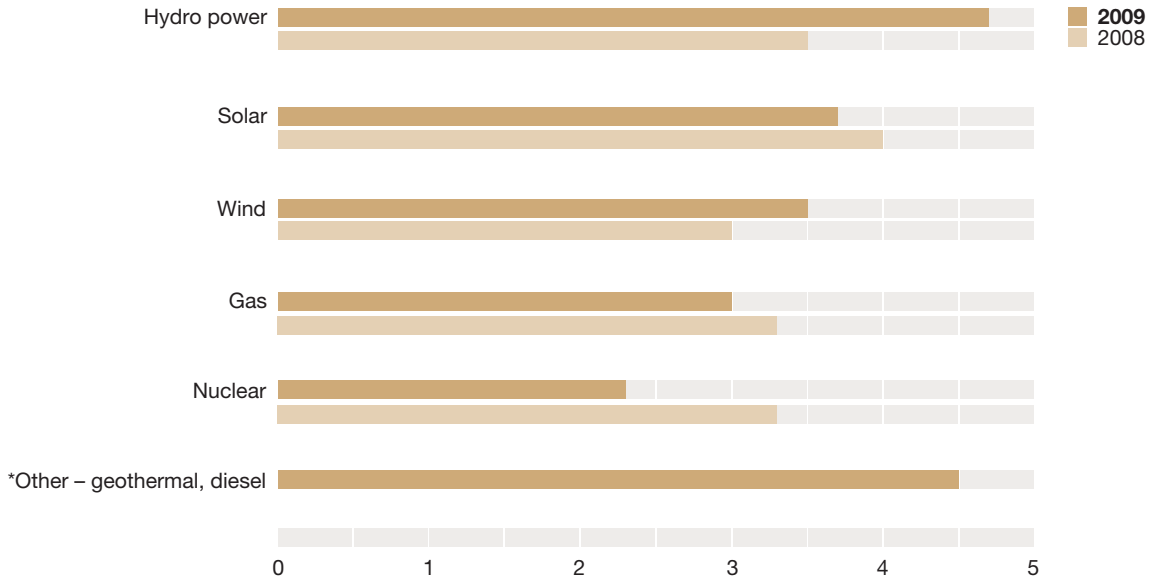
Source: PricewaterhouseCoopers, *Utilities global survey 2009*

As can be seen in Africa Figure 6, hydro power stands out for respondents as the alternative energy resource that will affect electricity pricing in the region. It is estimated that 95% of Africa's technical hydropower potential remains unexploited and it remains the leading region for the development of hydro technology. Only 36% of global survey respondents think that this technology will have more impact over the next five years, but this figure rises to 67% in Central, East and West Africa. The Congo, The Democratic Republic of Congo and Ethiopia are some of the hotspots for major hydro power projects. Moreover, as technology continues to improve, small-scale hydro power is likely to become an even more important generation source right across the continent.

Step change

PricewaterhouseCoopers' firms in the Central, East and West African region have observed a step change in thinking about African power issues. Development partners, governments, business and other stakeholders have started to work together to develop regulatory and other solutions to the many problems faced in the continent. Indeed, the time for talking is over – there is a pressing need for real change to happen. Without real change, the region's power shortages are likely to continue.

Africa Figure 6: **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 = greatly affect; 1 = no affect
*Question not asked in 2008
Source: PricewaterhouseCoopers, *Utilities global survey 2009*

Southern Africa

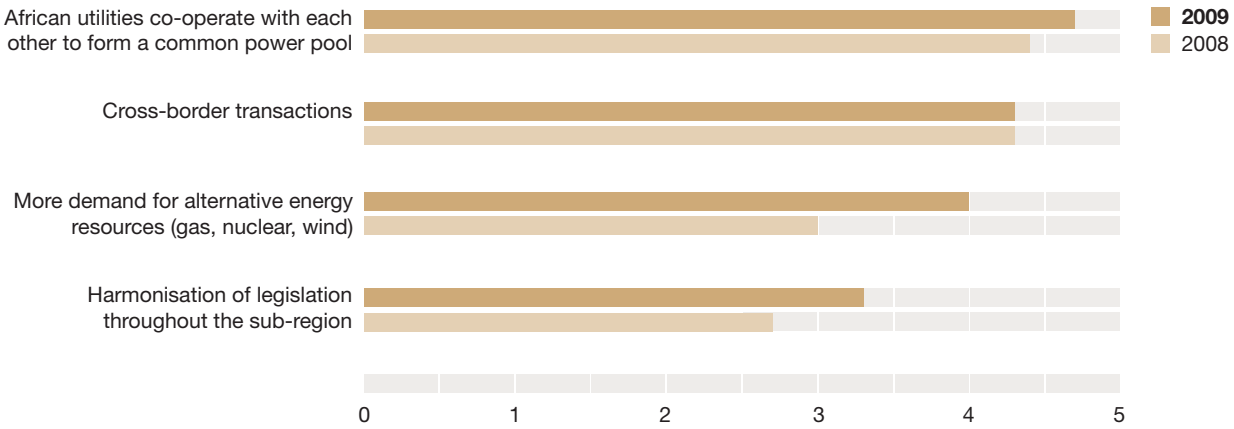
Like their peers in the rest of the continent, Southern African utility companies are focused on capacity expansion to meet the growing demand for power in the region. The successful execution of comprehensive expansion plans, coupled with energy efficiency and demand side management initiatives, are expected to restore the region's target reserve margin by 2012. Securing investor support and generation equipment amid worldwide demand is of the highest priority in boardrooms.

Outlook for pan-African initiatives

As is evident from the survey results across the African continent, cooperation between countries, governments, utility companies and other stakeholders will remain key for the development of solutions and actions to deal with the growing power demand in the region. The outlook for key pan-African initiatives remains strong in the eyes of survey respondents and, indeed, there is greater optimism on the outlook for harmonisation of legislation and alternative energy resources (Southern Africa Figure 1).

Respondents to our survey expect to see increased investment in new generation capacity and greater use of continent wide resources (see Southern Africa Figure 2). South Africa is responsible for more that 80% of power being generated in the region, with its national power utility Eskom's build programme set to double its generation capacity by 2026. Keeping the build programme on track is critical to the improvement of the current tight supply/demand balance in the region.

Southern 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 2009*

Cleaner energy

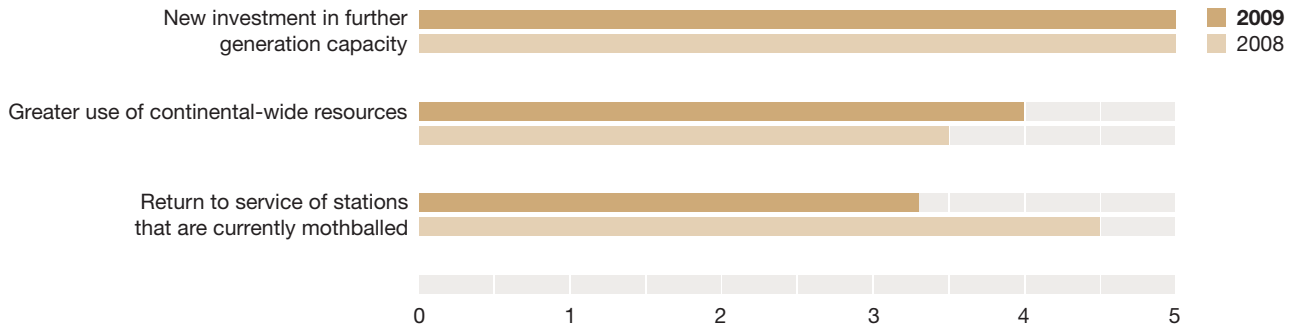
As we saw in Southern Africa Figure 1, survey respondents expect to see an increased demand in alternative energy resources in the region in the next five years. Alternative sustainable energy sources and rising fuel costs will continue to affect electricity pricing in the region in the future. In contrast to their counterparts elsewhere in the continent, Southern African survey respondents expect the trio of gas, solar and hydro power to have a high to medium impact on the future energy mix (see Southern Africa Figure 3). With the exception of gas, it is noticeable that expectations of the impact of all alternative fuel sources are lower compared with last year's survey. This is likely to be in part because of the pressure to increase generation capacity and the higher costs of such generation compared to the region's coal plants.

Restructuring

Restructuring of the generation and distribution markets will remain important if the industry is to meet challenges such as market competition and regulatory compliance. Performance measurement and improvement, investment in new technology and enhanced customer management are all seen as vital, by survey respondents, to the success of the region's market restructuring.

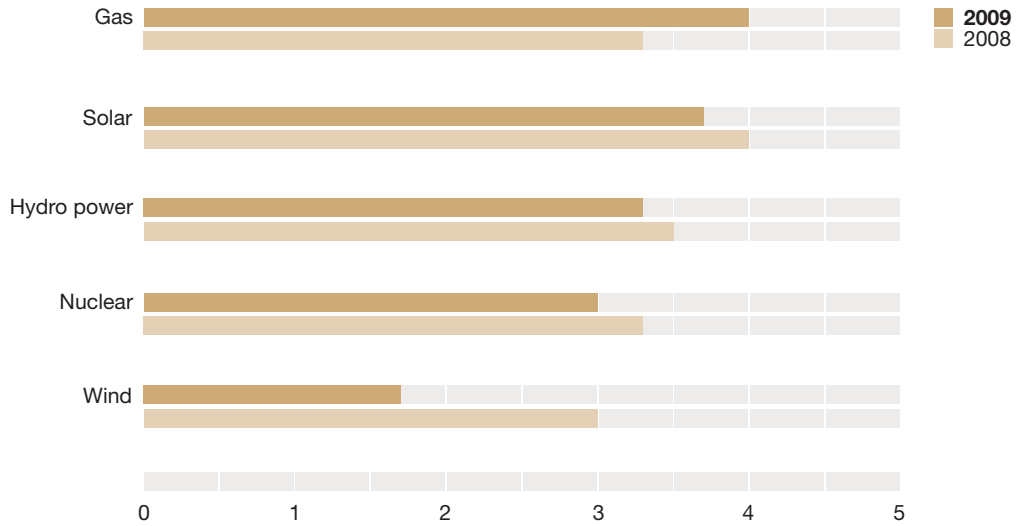
The Southern African region will continue to focus on capacity expansion over the next 10 years coupled with skilled resource development requirements. Regional co-operation will be key to the region's ability to meet industry challenges. Keeping expansion plans on track will be vital to the improvement of the current tight supply demand balance in the region.

Southern Africa Figure 2: **Given expectations that the demand for electricity will increase over the next few years, what affect will this have?**



Note: Average response. Rate where: 5 = very likely; 1 = unlikely
Source: PricewaterhouseCoopers, *Utilities global survey 2009*

Southern Africa 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 = greatest affect; 1 = no effect
Source: PricewaterhouseCoopers, *Utilities global survey 2009*

Looking ahead

‘What did you do in the downturn?’ Moves made in the downturn may come back to haunt or delight in a future upturn. The very business of power utility companies requires them to look far ahead. No government or customer will remember the downturn if the lights go out in the upturn. Likewise, the timetable of global warming means moves made during the current period are likely to be critical for the medium to long-term mitigation of greenhouse gas growth.

In any crisis there is opportunity. When energy and power prices were skyrocketing less than a year ago, the call for long-term solutions was loud and widespread. But now, as consumption falls and the energy crisis seems to be waning, there is a danger of being lulled into complacency. Already, in the current credit crunch, investments in wind, solar, and other evolving technologies have been among the first to be cut. Will companies and governments act now to set a more sustainable long-term course for power production and consumption or will the current economic crisis dilute such moves?

One crucial test will be the resolve of governments in the lead-up to the December 2009 UN Climate Summit in Copenhagen to try to agree a successor to the Kyoto Protocol. An energy policy that fosters the investment needed over the long term cannot be fully effective unless there is a clearly defined approach to carbon reduction requirements. Policy makers and power companies alike need to embrace a multi-resource mindset. There will be a need for collaboration and imaginative initiatives that leverage technology and people to promote increased supply and reduced demand.

Despite the current downturn, companies seeking growth are setting their sights on a future low carbon but high energy demand world. It will require bold footprint moves. In some cases that will be moves by companies upstream to secure gas supply, in other cases it will be horizontal expansion to increase presence in the renewable energy or nuclear power field and, in other cases, it will be developing new technological capabilities to ensure that new sources of power generation can be maximised and a more flexible mix of distributed and grid power networks can be deployed.

Traditional boundaries and spheres of operation are being superseded by new, more far-reaching power utility company roles and footprints. Already, utility companies are looking at the potential to develop networks of plug-in electric car recharging points and to harness the potential of overnight charging to make use of underused off-peak generation capacity. Carbon sequestration will require alliances with mining and oil exploration companies in order to develop underground or underwater carbon storage. First mover or early mover advantage in developing commercial scale carbon capture technology at an acceptable cost will give crucial competitive advantage in the future.

It is obvious that it is impossible to invest fast enough in alternative sources of energy to displace the significant contribution that hydrocarbons represent. At a minimum, hydrocarbons will be a bridge to a future when investments in alternative sources will have more impact. However, that is far down the road. For many countries now, exploiting domestic hydrocarbons is necessary to energy security. The development of cleaner coal technology will perhaps be the most critical single development in the power sector in the coming decade.

The most important factor underlining all of this, as our survey respondents make clear, will be an effective regulatory framework that provides the long-term certainty and incentives required to move to more energy secure, low carbon power production. Past cycles of one-off, short-term solutions must be broken and give way to a long-term planning horizon—30 years or more. That will not just require an effective agreement at Copenhagen in December 2009 but needs to embrace other regulatory policies as well. Policies that govern such matters as consumer and buildings energy efficiency and the permitting of sites for power generation, LNG re-gasification terminals and other vital infrastructure must also be aligned with energy security and low carbon goals.

Global contacts

Manfred Wiegand
Global Utilities Leader
Telephone: +49 201 438 1517
Email: manfred.wiegand@de.pwc.com

Michael Hurley
Global Energy, Utilities & Mining Advisory Leader
Telephone: +44 20 7804 4465
Email: michael.hurley@uk.pwc.com

James Koch
Global Energy, Utilities & Mining Tax Leader
Telephone: +1 713 356 4626
Email: james.koch@us.pwc.com

Olesya Hatop
Global Energy, Utilities & Mining Marketing
Telephone: +49 201 438 1431
Email: olesya.hatop@de.pwc.com

Territory contacts

Asia-Pacific

Australia
Michael Happell
Telephone: +61 3 8603 6016
Email:michael.happell@au.pwc.com

China
Gavin Chui
Telephone: +86 10 6533 2188
Email: gavin.chui@cn.pwc.com

India
Kameswara Rao
Telephone: +91 40 2330 0750
Email: kameswara.rao@in.pwc.com

Indonesia
William Deertz
Telephone: +62 21 521 3975
Email: william.deertz@id.pwc.com

Singapore
Robert Montgomery
Telephone: +65 6236 4178
Email: robert.montgomery@sg.pwc.com

Europe

Austria
Gerhard Prachner
Telephone: +43 501 88 1800
Email: gerhard.prachner@at.pwc.com

Belgium
Bernard Gabriels
Telephone: +32 3 259 3304
Email: bernard.gabriels@pwc.be

Denmark
Per Timmermann
Telephone: +45 39453945
Email: per.timmermann@dk.pwc.com

Europe (continued)

Finland
Juha Tuomala
Telephone: +358 9 2280 1451
Email: juha.tuomala@fi.pwc.com

France
Philippe Girault
Telephone: +33 1 56 57 88 97
Email: philippe.girault@fr.pwc.com

Germany
Manfred Wiegand
Telephone: +49 201 438 1517
Email: manfred.wiegand@de.pwc.com

Greece
Socrates Leptos-Bourgi
Telephone: +30 210 687 4693
Email: socrates.leptos.-.bourgi@gr.pwc.com

Ireland
Denis O'Connor
Telephone: +353 1 792 6288
Email: denis.g.oconnor@ie.pwc.com

Italy
John McQuiston
Telephone: +390 6 57025 2439
Email: john.mcquiston@it.pwc.com

Netherlands
Aad Groenenboom
Telephone: +31 26 3712 509
Email: aad.groenenboom@nl.pwc.com

Norway
Staale Johansen
Telephone: +47 9526 0476
Email: staale.johansen@no.pwc.com

Portugal
Luis Ferreira
Telephone: +351 213 599 296
Email: luis.s.ferreira@pt.pwc.com

Russia & Central and Eastern Europe
David Gray
Telephone: +7 495 967 6311
Email: dave.gray@ru.pwc.com

Spain
Gonzalo Sanchez Martinez
Telephone: +34 946 022 534
Email: gonzalo.sanchez@es.pwc.com

Sweden
Martin Gavelius
Telephone: + 46 8 555 335 29
Email: martin.gavelius@se.pwc.com

Switzerland
Ralf Schlaepfer
Telephone: +41 58 792 1620
Email: ralf.schlaepfer@ch.pwc.com

Turkey
Faruk Sabuncu
Telephone: +90 212 326 6082
Email: faruk.sabuncu@tr.pwc.com

United Kingdom
Ross Hunter
Telephone: +44 207 804 4326
Email: ross.hunter@uk.pwc.com

Middle East and Africa (MEA)

Middle East
Reinhard Schulz
Telephone: +971 2 6946905
Email: reinhard.schulz@ae.pwc.com

Central, East and West Africa
Vishal Agarwal
Telephone: +254 20 285 5581
Email: vishal.agarwal@ke.pwc.com

Southern Africa
Stanley Subramoney
Telephone: +27 11 797 4380
Email: stanley.subramoney@za.pwc.com

The Americas

United States
David Etheridge
Telephone: +1 415 498 7168
Email: david.etheridge@us.pwc.com

Canada
Alistair Bryden
Telephone: +1 403 509 7354
Email: alistair.bryden@ca.pwc.com

John Williamson
Telephone: +1 403 509 7507
Email: john.m.williamson@ca.pwc.com

Latin America
Jorge Bacher
Telephone: +54 11 4850 6801
Email: jorge.c.bacher@ar.pwc.com

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Methodology

A world beyond recession Utilities global survey 2009 is based on research conducted between January-February 2009 with 69 senior executives from 65 utility companies across 40 countries. Research covered the four major regions of the Americas, Europe, 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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