

Turn risks and opportunities into results

Exploring the top 10 risks and opportunities
for global organizations

Power and utilities sector

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Introduction

New technologies and a changing customer relationship are driving a fundamental transformation of the power and utilities business model. Market volatility, pricing pressure, variations in market performance, demanding stakeholders – all have contributed to this drive toward transformation. And with that drive comes opportunity. For that reason, we have broadened the scope of what has traditionally been our *Business Risk* report to incorporate both risks and opportunities.

This report is part of a wider cross-sector piece of research that explores the top 10 business risks and opportunities globally and across seven sector groups. The seven sectors are power and utilities, banking, retail, government and public administration, oil and gas, health care and life sciences.

As in previous years, we have taken a “bottom-up” approach to our work, gathering opinions from leading industry-based and academic commentators, across the seven global sector groups.


In addition, for the first time, this year we have conducted a second wave of research. This comprised a large-sample survey of companies and governments in 15 countries in order to rank the risks and opportunities, obtain forecasts on whether these challenges would be more or less important in 2013, and discover how leading organizations in each of the seven sectors are responding to these challenges.

Significant shifts in the cost/accessibility of capital was ranked as the number one risk for the power and utilities sector – higher than any of the other sectors surveyed. The research also showed three new risks to the power and utilities top 10: uncertainty in climate policy and carbon pricing (ranked 4th), backlash against renewable subsidies (ranked 8th), economic shocks and resulting short-term energy demand shocks (ranked 10th). And as the war for talent intensifies, this risk moved the most number of places up the ranking, from 15th to 7th.

With regards to opportunities, rising emerging market demand was ranked number one overall. Though placed only fifth in the global rankings, for the power and utilities sector, the possibilities presented by these fast-growing markets are considered to be huge. Innovation opportunities also feature strongly in the ranking, with both the electric vehicle market and cleantech appearing in the top 10.

The top 10s are the result of a qualitative, opinion-gathering process, designed to identify the key risks and opportunities for businesses in 2011 and beyond. However, we also recognize that the definition of risks and opportunities varies from sector to sector and from firm to firm, depending on a company's objectives and many other factors. We therefore hope the list will trigger a debate, which we would like to explore further. Are the items on the lists similar to those you are monitoring? Are they your top 10? Have our panelists missed anything critical?





Executive summary

Based on our interviews with power and utilities sector commentators and on our global multi-sector survey (which included more than 110 power and utilities executives in 15 countries), we have compiled the following rankings of the top 10 risks and opportunities for power and utilities companies in 2011.



The top 10 risks

1. Significant shifts in the cost/accessibility of capital

Up three places from the 2010 report.

Power and utilities executives were more likely than those in any other sector to report continuing difficulty in accessing capital. This is likely attributable to the sheer scale of the investment needs in the sector. (Forecast for 2013: rising from the current ranking.)

2. Compliance and regulatory risks

Down one place from the 2010 report.

Traditional regulatory interactions centered on the rate case are being supplemented by often-contradictory pressures regarding environmental impact, efficiency and security of key infrastructure. (Forecast for 2013: no change from the current ranking.)

3. Political intervention in power and utilities markets

Down one place from the 2010 report.

The impact of politics is increasingly being felt in areas including planning permissions, tariff setting, renewable energy targets, access to fuel supplies and smart grids. (Forecast for 2013: rising from the current ranking.)

4. Uncertainty in climate policy and carbon pricing

New this year.

The objective of lowering carbon emissions from power generation continues to drive the transformation in the industry, but the failure of governments to meet key emissions objectives means that policy is at a crossroads. Market-based approaches to carbon pricing are losing out to direct regulation of emissions. (Forecast for 2013: falling from the current ranking.)

5. Commodity price volatility

Unchanged at five in 2010.

Commodity price volatility has been extraordinary in recent years and may be here to stay. Volatile prices not only impose short-term losses, they can produce stranded investments. (Forecast for 2013: no change from the current ranking.)

6. Managing planning and public acceptance risk

Down one place from the 2010 report.

This risk encapsulates siting issues around major infrastructure developments and corporate social responsibility (CSR). Fortunately, the sector is accustomed to the challenges, and power and utilities executives were less likely than those in any other sector to feel that public pressures had risen dramatically in recent years. (Forecast for 2013: rising from the current ranking.)

7. War for talent

Up eight places from the 2010 report – where it was below the radar in 15th place.

The war for talent is intensifying, partly because of demographic pressures, and partly because of competition from other sectors. The power and utilities sector must compete with other industries for talent and executives report weaknesses in their staff development programs. (Forecast for 2013: rising from the current ranking.)

8. Backlash against renewable subsidies

New this year.

The expense of renewable energy means it relies heavily on subsidies and, in the event of a public backlash, these subsidies may be removed. Austerity measures in many countries heighten risks. (Forecast for 2013: rising from the current ranking.)

9. Inefficient use of low-carbon technologies

Down two places from the 2010 report.

Transformation of the industry through the implementation of green technologies – including nuclear energy, renewable energy and carbon capture and storage (CCS) – carries considerable risk. Executives report concerns regarding regulation, innovation and employee skills. (Forecast for 2013: no change from the current ranking.)

10. Economic shocks and resulting short-term energy demand shocks

New this year.

The threat of a double-dip recession is significant and could have a knock-on effect on energy demand, particularly in heavily industrialized countries. (Forecast for 2013: falling from the current ranking.)



The top 10 opportunities

1. Rising emerging market energy demand

For those power and utilities companies not geographically restricted by regulation, the potential benefits of diversification across fast-growing markets are huge. Nonetheless, local knowledge and adaptability are required. Some 31% of power and utilities respondents in our survey report that they have not reaped the gains they expected from emerging markets. (Forecast for 2013: rising from the current ranking.)

2. Building regulator confidence

Transformational factors such as green growth initiatives and smart grids increase the potential benefit of a good relationship with regulatory and policy-making authorities. (Forecast for 2013: no change from the current ranking.)

3. Growth in smart metering/energy service business model

Smart meters inform users as to how much energy they are using in real time. In the long-term, given friendly regulation and informed consumers, there are significant opportunities in this area, including new business models, as the industry transforms. (Forecast for 2013: no change from the current ranking.)

4. Building investor confidence

Investor confidence is key to capitalizing on the huge investment opportunities in the sector as it goes through a period of change. This is particularly a challenge for power and utilities executives, who reported a lower success rate than all other sectors we surveyed in their investor relations programs. (Forecast for 2013: no change from the current ranking.)

5. Acquisitions or alliances to gain new capabilities

Mergers and acquisitions activity within the power and utilities sector is a key opportunity to gain scale for major investments, the expertise to execute new business models and the skills to deliver new technologies. (Forecast for 2013: no change from the current ranking.)

6. Integration of distributed energy resources

Analysts we interviewed identified distributed energy resources as likely to become one of the highest growth areas within the sector in the next five years. (Forecast for 2013: rising from the current ranking.)

7. Building public confidence

Power and utilities companies have not traditionally had to engage intensively with consumers. A change in mindset could potentially lead to friendlier regulation and competitive advantage in a transformed industry. (Forecast for 2013: no change from the current ranking.)

8. Increasing international integration of grids

In Europe, in particular, integration remains on the political agenda; the plan is for a fully integrated energy grid before 2020. This would balance demand peaks and intermittency in supply, which is especially crucial for renewables. (Forecast for 2013: no change from the current ranking.)

9. Growth in the electric vehicle market

Analysts we interviewed identified this as a key opportunity for the sector, although perhaps over a longer-term and only in certain geographies. Partnerships may be key to exploiting this growth market. (Forecast for 2013: rising from the current ranking.)

10. Rising cleantech innovation in emerging markets

This opportunity is driven by increasing innovation capacity in emerging markets, as well as cost advantages and the growing demand for cleantech. (Forecast for 2013: rising from the current ranking.)

Water sector

Based on our interviews with water sector commentators, the top five risks and opportunities for water utilities in 2011 are:

The top five risks

1. Water scarcity
2. Deregulation and regulatory uncertainty
3. Climate change and pollution
4. Re-municipalization of water service provision
5. Escalation of water quality standards

The top five opportunities

1. Increasing emerging markets demand for water infrastructure
2. Water desalination
3. Wastewater treatment
4. Water transfers and international trade
5. Water as a "human right"

A long, dark shadow of a person is cast across a gravel path that stretches into the distance. The path is flanked by low-lying green and yellow vegetation. In the far background, there are rolling hills under a clear, light blue sky. The lighting suggests it is either early morning or late afternoon, as the shadow is very long and the sky is a pale, clear blue.

Part 1: risks

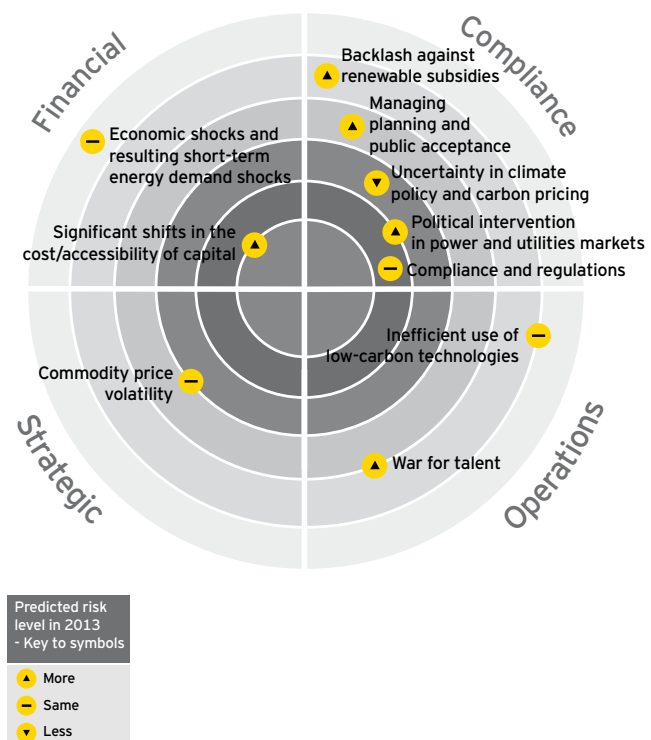
Ernst & Young sector risk radar

Our risk radar is a simple device that allows us to present a snapshot of the top 10 risks in the power and utilities sector.

The risks at the center of the radar are those that the industry commentators we interviewed, on average, thought posed the greatest challenge to power and utilities companies in the years ahead. Arrows indicate whether the executives thought the risk would rise or fall in importance by 2013.

The radar is divided into four sections that correspond to the

Ernst & Young Risk Universe™ model. Compliance threats originate in politics, law, regulation or corporate governance. Financial threats stem from volatility in markets and the real economy. Strategic threats are related to customers, competitors and investors. Finally, operational threats affect the processes, systems, people and overall value chain of a business.



The top 10 risks

1. Significant shifts in the cost/accessibility of capital

With financial systems still fragile in the wake of the credit crunch, and with the large amount of investment needed worldwide for power and utilities infrastructure, it perhaps comes as no surprise that access to credit appears dead center in our 2011 risk radar. This risk has risen from the fourth spot last year. Perhaps surprisingly, given the recovery in credit markets, the panelists we spoke to expected it to rise further in importance (if not in rank) by 2013.

Indeed, our global multi-sector survey found that power and utilities respondents were more likely than those of any other sector to report that they faced challenges related to capital-raising. More than 50% did, while in most other sectors the figure was closer to 30%. Certainly, there is substantial diversity in the sector, with regulated companies facing a dramatically different situation than power and utilities firms operating in competitive markets. Many regulated power and utilities companies continue to enjoy top-notch credit ratings.

Looking at global averages, with respondents operating in competitive markets included in the sample, the most frequently reported driver of this risk was the continued capital availability challenges that relate to the difficult global financial environment. The second most commonly reported driver of credit access risks was simply the massive need for capital investment in the sector. This has been brought about in part by the aging of energy infrastructure, particularly in Western Europe and the United States. For instance, in many countries throughout these regions, nuclear power stations built in the 1970s are coming to the end of their operational lives. As Michael A. Crew, Center for Research in Regulated Industries (CRR) Professor of Regulatory Economics at Rutgers Business School, explains, "High approval, regulatory and construction costs make funding of new large power plants, especially nuclear plants, quite difficult ... running them as merchant plants may be a problem." The recent backlash against nuclear power, as a result of the effects of the Sendai earthquake on the Fukushima-Daiichi power plant in Japan, is almost certain to further complicate issues.

Drivers of access to credit risks, as reported by power and utilities organizations surveyed

Ranked by frequency of mention

Rank*	Driver
1	Continued constraints on capital availability
2	Large capital needs for major investment programs
3	Sector perceived as unattractive to investors

** Based on 33 responses from power and utilities respondents to our global multi-sector survey. Rank order may not reflect statistically significant differences in all cases. Unclassifiable/refused responses not shown.*

While conditions in financial markets have improved dramatically since the credit crunch, the ongoing sovereign debt crisis may be a source of risk for the sector. Many sovereigns and sub-sovereigns are having great difficulty raising funds; as a professor emeritus at Massachusetts Institute of Technology (MIT) commented: "Capital market conditions create additional hurdles for utilities throughout the world. However, the United States has disproportionate exposure to risks to municipalities' ability to raise capital due to the large amount of 'public power' that is largely linked to municipal governments." That said, for regulated utilities, cash flows are guaranteed by consumers rather than governments, so exposure to these issues should be limited.

Indeed, the impact of capital constraints may be felt most keenly by firms engaged in renewable energy. As one analyst put it, "Renewable energy deployment has depended heavily on project finance with highly leveraged debt levels." One key aspect to this risk is that as this "easy money" has now dried up, the prospects for innovation within the sector may be restricted. The analyst continues, "Tighter money and reduced leverage appears likely to be with us for some time, and the consequences for renewable energy deployment are being reported frequently in the trade press." In the words of a head of group strategy at a leading European energy firm, this "delays innovation and investments."

Another place where investment is sorely needed is in the expansion of power grids to accept new forms of energy. As sources of power are more diversified than ever, with wind, solar and hydro power becoming increasingly common in conjunction with fossil fuel-based power, the costs associated with grid integration are rising all the time. One key example is the cost of installing transmission grids for offshore wind farms.

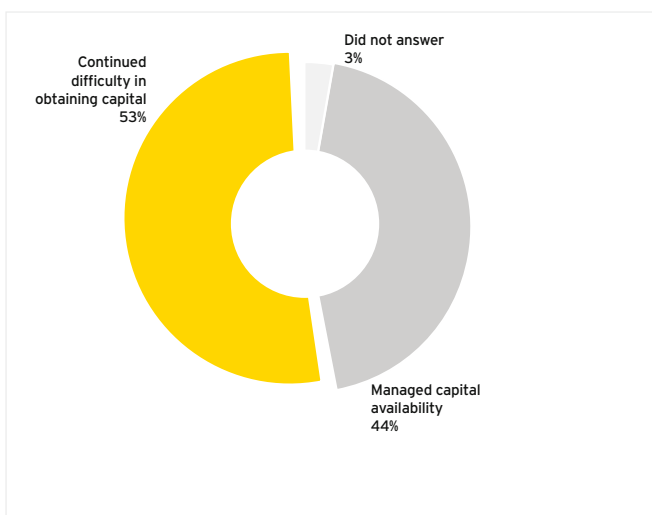


Power and utilities companies have, to some extent, been able to mitigate risks in this area by tapping into other sources of financing, notably bond financing. Especially in the last two years, utilities have ramped up their bond issuance activities, going directly to investors rather than to the normal banking sources of finance for their needed expansion and operational capital. How long this lasts will significantly affect how dangerous this risk remains.

Through all this, there is a strong need for companies to remain flexible. Utilities providers need to be ready to adapt, particularly as the forecast throughout the financial sector is so uncertain – one analyst forecasts that another major banking sector shock is likely within the next three to five years, while another noted that there is still a significant level of “event” risk in the market.

According to our global multi-sector survey, the most popular strategies for managing this risk are simply to wait until capital markets reopen, or rely on support from parent companies. Over half (55%) of the power and utilities companies we surveyed indicated these strategies were not effective. For many power and utilities firms, there is a massive need for capital, which leads to constant concerns over how to finance that capital.

Sector responses to credit risks



Factors mitigating access to credit risks, as reported by power and utilities organizations surveyed

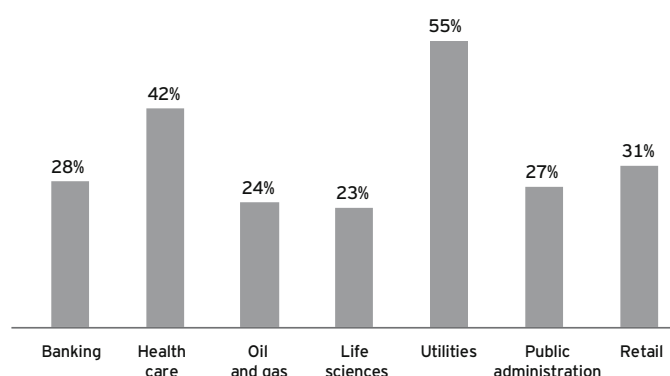
Ranked by frequency of mention

Rank*	Mitigating factor
1	Re-opening of capital markets
2	Support from parent company

* Based on 33 responses from power and utilities respondents to our global multi-sector survey. Rank order may not reflect statistically significant differences in all cases. Unclassifiable/refused responses not shown.

As companies' future success depends on that access, many companies are focused on alternative ways to raise capital, including selling assets, entering into joint ventures and considering stock mergers to strengthen their balance sheets.

Percentage reporting continued difficulty in accessing credit markets, by sector





2. Compliance and regulatory risks

Regulators set the rules utility companies must play by, and they have become significantly more stringent in their actions within the last 5-10 years. In addition, new factors have entered the equation, such as regulations surrounding renewable energy sources, energy efficiency and physical security.

Compliance and regulatory risk held the top spot for the power and utilities sector in the 2010 report, falling to second place this time around, and the commentators we interviewed, on balance, expect it to remain at the same level of severity in 2013.

The complexity of regulation is increasing, both at a big picture level and the operational detail level. At the big picture level, environmental concerns have taken on new dimensions in the last five years. Previously, the focus was exclusively on energy efficiency and cost; however, concerns about security of supply and low-carbon technologies have surfaced, along with concerns regarding equity and sustainability. At the operational level, low-carbon technology is changing all the time, while regulation struggles to catch up.

Our global multi-sector survey indicates that in the power and utility sector, new legislation is the most frequently reported driver of regulation and compliance risk for companies. Other key drivers of this risk include the rapid change of pace in the regulatory environment, rising CSR pressures and the creation of new regulatory bodies.

Companies operating in developing markets face regulation and compliance risks specific to these jurisdictions, as the level of institutional development is often limited. As one senior lecturer at Dundee University says, "The regulatory arrangement is poor and less transparent in many developing countries, thereby reducing incentives for private participation. Instability of the regulatory framework is another issue." That this instability is often a consequence of the natural development of legal and regulatory systems makes it no less challenging to manage. For instance, in markets that have recently moved toward a capitalist model, such as China, the development of corresponding legal structures has entailed a breakneck pace of regulatory change and new legislation.

Drivers of regulation and compliance risks, as reported by power and utilities organizations surveyed

Ranked by frequency of mention

Rank*	Driver
1	New legislation
2	Sector-specific regulatory pressures
3	Rapid pace of change in regulation
4	General trend toward regulatory tightening
5	Rising CSR pressures
6	Creation of new regulatory oversight bodies

** Based on 75 responses from power and utilities respondents to our global multi-sector survey. Rank order may not reflect statistically significant differences in all cases. Unclassifiable/refused responses not shown*

Additionally, in many countries, power and utilities companies are to some extent impacted by reforms to financial sector regulation that are taking place in the wake of the credit crunch due to their energy trading activities. Additional regulatory oversight is coupled with more stringent capital requirements for energy traders as for financial institutions. These have significant impacts in terms of new infrastructure builds, concerning both cost requirements and available capital (for more commentary on credit access risk, see page 8).

The challenge for companies within the next few years will be to adapt quickly as regulators catch up with emerging technologies and popular demands. For example, in the UK, the market was designed to eliminate excess capacity, but this might increasingly become required with the intermittent nature of renewable energy, so capacity payments may now be introduced.

Regulators and companies may agree on the overall objectives of utilities regulation; the problem, as ever, is the mechanics of how to arrive there. As one analyst noted, "Poor incentives for investing in infrastructure and regulatory pressure on operating profits has caused cannibalization of distribution and transmission system capital improvements in a number of markets." Regulation has also been caught up in bureaucratic delay, which further increases the time lag between policy and implementation.

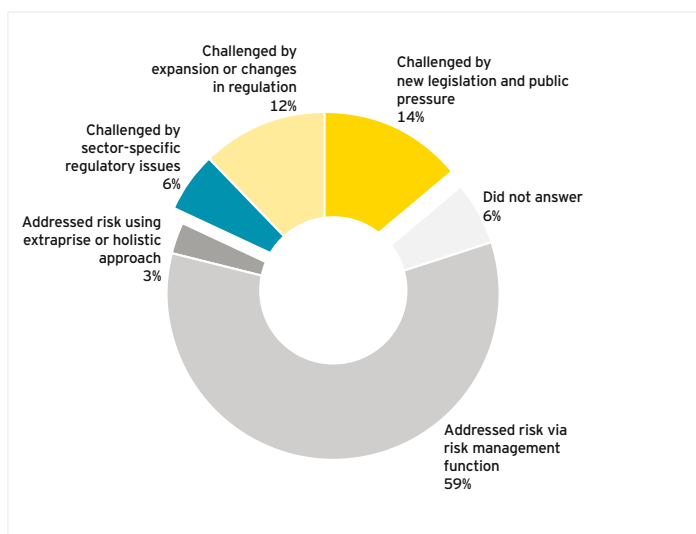


To combat this risk effectively, power and utilities companies will need to keep the lines of communication open with regulators. The intention of future regulation is likely to be for companies to raise their standards of accountability, on a broadening range of issues, so there should be much more emphasis around reporting to regulators and ensuring data integrity. Traditional interactions centered around the rate case are being augmented by security, efficiency and environmental concerns.

Our global multi-sector survey shows that many power and utilities companies are specifically tasking chief risk officers (CROs) with the management of regulatory risk, while others are taking extra effort to update their compliance functions in an attempt to keep pace with regulation. The third-most frequently reported strategy for managing this risk is to invest in government relations capability. Our data shows that well over half (64%) of all companies in this sector have implemented measures to address this risk that they feel are reasonably effective, while 35% feel their strategies have as yet been of limited effectiveness, for a variety of reasons.

Looking ahead, the challenges in this area are unlikely to diminish. As the chairman of a leading energy firm pointed out, "Smart grid technologies being introduced often rely on dynamic pricing or time of use pricing to achieve the system-wide savings. This directly challenges many retail regulators' historical approach

Sector responses to regulation and compliance risks



Factors mitigating regulation and compliance risks, as reported by power and utilities organizations surveyed

Ranked by frequency of mention

Rank*	Mitigating factor
1	Management of risk via CRO function
2	Continuous updating of compliance function
3	Investment in government relations capability
4	Expansion of compliance focus to extraprise/suppliers/customers
5	Investment in IT to support compliance
6	Capability for rapid implementation of new requirements
7	Narrowing of compliance focus to key issues

* Based on 75 responses from power and utilities respondents to our global multi-sector survey. Rank order may not reflect statistically significant differences in all cases. Unclassifiable/refused responses not shown.

to price-based regulations for utilities and change has occurred slowly. Regulators need to forgo their traditional role to reflect new operational realities."



3. Political intervention in power and utilities markets

As something that is in some jurisdictions being seen as a human right rather than “just” a commodity, energy is an increasingly politicized issue. Interventionist policy from governments is a key risk issue for power and utilities firms, particularly with recent volatility in fuel prices.

This risk has fallen one spot from the 2010 report, where it ranked second; however, panelists expect this risk to become more crucial for companies by 2013.

As our global multi-sector survey shows, the expansion of regulation directly leads to increased workload and increased costs for utility firms. Other frequently reported consequences of expanding regulation include a decrease in organizational flexibility and diminished ability to innovate.

The key motives of interventionist policy-makers are fairness and equality, but these goals are not always met. In search of these goals, fundamental questions are often asked about the role of utilities; for example, what is a reasonable level of profit for a utility? In order for power and utilities organizations to make necessary investments, they must make money, but power and utility companies are traditionally easy targets for governments who think they are profiting too much. This is not helped by significant public pressure. As one analyst we interviewed put it, with some overstatement: “... government is notoriously short-sighted and subject to public enthusiasms that can wax and wane with remarkable abruptness.”

In summary, policy implementation is not always consistent with policy objectives. Indeed, one analyst notes that the frequent mismatch between the visions of the national policy-maker and the actions of the regulator are major hurdles to planning for the future. Policy-makers are not always aware of the impact of their decisions on the industry. Additionally, companies cannot make decisions about investment targets until the details of such policies are fleshed out, which is often a lengthy process.

Drivers of expansion of governments' role risks, as reported by power and utilities organizations surveyed

Ranked by frequency of mention

Rank*	Driver
1	Expanding regulation, increasing workload and costs
2	Expanding regulation, harming organizational flexibility/agility
3	Regulatory backlash/ill-considered government policies
4	Expanding regulation, harming ability to innovate

** Based on 39 responses from power and utilities respondents to our global multi-sector survey. Rank order may not reflect statistically significant differences in all cases. Unclassifiable/refused responses not shown.*

Recently, volatility in fuel prices has led to rising risks of government intervention. Independent consultant Chris LeFevre notes that “consumer exposure to increased gas price volatility is likely to be politically difficult. The issue is further complicated by high levels of cross-subsidization in some municipally owned utility companies.” Working out these tangles of subsidies and how to ensure consumers pay a representative price is challenging, and the risk that policy-makers may get it wrong is substantial.

Climate change adds an additional layer of complexity. As an energy analyst we interviewed noted, “Climate change objectives may require intervention that constrains liberalized electricity sectors.”

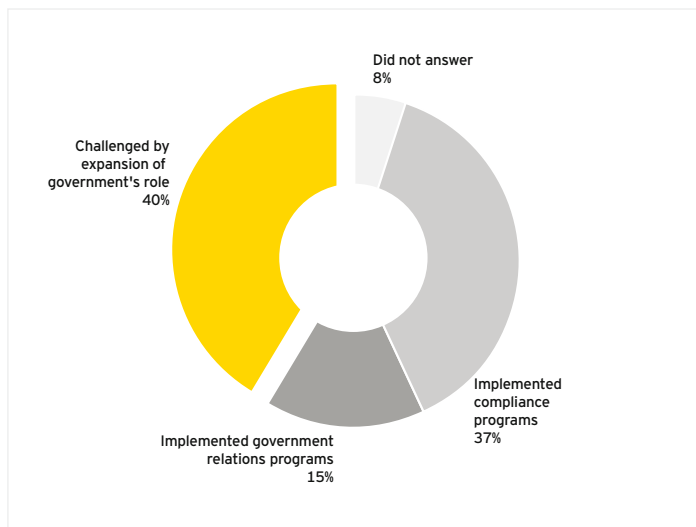
There is also the matter of new technologies. For instance, in Europe, governments have decided that smart meters are essential to save energy, but with very little data on the extent of their effect, and questions over who will bear the cost unanswered in some geographies. (Smart meters are discussed further on page 44.)



Once again, this risk requires that companies keep working with regulators and policy-makers, as well as with the public, to make it easier for governments to consider the needs of all parties when drawing up policy. Dialogue with the regulators is necessary to ensure decisions are made with the utility companies in mind, while transparent and open dialogue with the public may help to ease popular pressure on both policy-makers and regulators.

Our global survey shows that the main strategy adopted by power and utilities companies to manage this risk is to ensure correct adherence to legal requirements – although the popularity of this limited approach may reflect a risk that is inherently difficult, if not impossible, to manage. Forty percent of power and utilities companies surveyed felt their efforts to manage rising government intervention had not been effective, for a variety of reasons. Of those reporting successful strategies, 37% focused on compliance and 15% on government relations.

Sector responses to expansion of governments' role risks



Factors mitigating expansion of governments' role risks, as reported by power and utilities organizations surveyed

Ranked by frequency of mention

Rank*	Mitigating factor
1	Adherence to legal requirements
2	Limited impact in sector as yet
3	Adoption of a constructive "partnership" approach with government
4	Investment in government relations
5	Adjustments to business strategy to respond to rising government role

* Based on 39 responses from power and utilities respondents to our global multi-sector survey. Rank order may not reflect statistically significant differences in all cases. Unclassifiable/refused responses not shown.



4. Uncertainty in climate policy and carbon pricing

This risk is a new entrant to our top 10, having not appeared in the 2010 report, although panelists expect it to diminish in importance within the next three years. The issue is not that the drive toward lower carbon emissions is diminishing, but that market-mechanisms are decreasing in importance relative to other regulatory measures.

This risk has been illustrated over the last 10 years by a marked failure of governments to deliver on objectives. The EU Emission Trading Scheme (ETS) is a good example of this, according to one analyst we interviewed. There were very strong commitments made around the ETS, and assertions that it would provide very strong signals to investors. However, following recent volatility in carbon markets, investors have realized that this scheme is potentially not going to support them in their long-term investments. Additionally, it has become apparent that this approach is most likely not going to deliver the emissions reductions needed in the next 5-10 years. Because of this, there is correspondingly greater emphasis on national governments underpinning low carbon prices.

Looking forward, the outlook is mixed. The big unknown is how countries will react to the changes made in Phase III of the EU ETS. If companies will not accept the restrictions, or bargain to change the rules in some way, then the position may shift once again.

There is also tremendous uncertainty at the macro level. As one energy analyst noted,

“The driver is the absence of any strong and coordinated attempt by the international community to adopt a global scheme of control for climate change.”

Looking forward, a sustained period of low growth may lead to a low cost of future emissions.

In the US, legislative activity on this issue is expected to be relatively limited, at least until the 2012 elections. In California, implementation of cap and trade will continue, while many northeastern states have a voluntary carbon trading scheme, introduced in 2008. These issues are likely to stay at a state level rather than a federal level for the time being.

This is a long-term risk, and its impact is likely to be felt most keenly in that time frame. According to one academic we interviewed, “Uncertainty over carbon value and the will of the international community to recognize it has several consequences; it may weaken the resolve of certain regions, especially the EU, to continue with moderately aggressive policies; it may lead to the adoption at a late stage of uncoordinated emergency strategies; in any case, it creates uncertainty about what value will be assigned by public powers to the carbon-free energy.”

This uncertainty affects project funding, as increasing risk premiums have to be built in to the cost of both renewable and non-renewable long-term infrastructure projects. The future generation mix is likely to change, with less of an emphasis on coal-fired power plants and a greater emphasis on nuclear. But no one is sure to what extent this will be the case. Public acceptance of nuclear power, in the wake of Japan’s earthquake and tsunami, will play a big role.

To reduce this risk, companies must seek to remain as flexible as possible in their planning, consider how their portfolio may perform under a range of different scenarios, seek to accelerate cost recovery and negotiate financial issues up-front with regulators – particularly for cleaner generation facilities and expensive new power plants. There is nonetheless a significant time lag between the investment on the plants and the recuperation of benefits, and companies must cover their exposures as best as possible.



5. Commodity price volatility

The recent history of commodity prices has been one of exceptional volatility. This risk has risen from sixth on the radar in the 2010 report. On balance, the panelists we interviewed expect it to remain at a similar level of impact in 2013.

In 2006, commodity price inflation began in earnest. The bull market of 2008 pushed the price of oil to over US\$100 per barrel – eventually peaking at close to US\$150 during July and August – before a dramatic fall to nearly US\$30 per barrel by the end of the year. Across the spectrum of energy markets, this trend was reflected – in coal, gas and power prices.

However, as post-financial-crisis shocks reminded us, commodity price volatility is not only on the upsides. Investments can be left stranded if prices plunge. As an academic analyst explained, “The most striking development in energy economics of recent years is the emergence of much lower than expected natural gas prices due both to the development of shale gas resources in the US, the oversupply of pipeline gas in Europe and emerging overcapacity in liquefied natural gas exports from the Middle East.”

In recent months, emerging market demand recovery followed by a crisis in Libya has again seen oil prices rise very sharply. Although these price rises are in many cases attributable to specific events, on balance, the panelists we interviewed expected the price of commodities to stay volatile for the foreseeable future, and in the long-term, to steadily rise. This is partly due to concerns about “peak oil” and partly due to high levels of economic growth expected in emerging markets. According to one analyst, coal prices will also continue to rise, and even gas prices, which have fallen during 2010 due to the impact of shale gas discoveries in the US and overcommitment on long-term take-or-pay contracts in Europe, are expected to continue to rise on a long-term trend.

The potential consequences of commodity price volatility for economic growth are obvious – higher energy prices (oil in particular) may dent global economic growth severely. Given the already perilous position of the world economy at present, this is a serious risk. Even if geopolitical risks do not drive an oil price shock, as one power and utilities sector analyst notes,

Factors mitigating market risks, as reported by power and utilities organizations surveyed

Ranked by frequency of mention

Rank*	Driver
1	Continuous monitoring of market risks
2	Continuous monitoring of market trends, shifts and developments
3	Diversification of customer base, expansion of customer reach
4	Diversification of supplier base
5	Monitoring of commodity availability and pricing
6	Active management of currency risk
7	Diversification of product/service portfolio
8	Improvements to business relationships with suppliers

** Based on 52 responses from power and utilities respondents to our global multi-sector survey. Rank order may not reflect statistically significant differences in all cases. Unclassifiable/refused responses not shown.*

“When economic growth returns to Western economies, this will put increasing pressure on energy prices.” In the longer-term, however, commodities are to some extent substitutable, so increases in oil prices, if isolated, can potentially be cushioned by alternative fuels.

Individual utilities, of course, do not have such a high level of adaptability. As one analyst put it, “Unhedged energy suppliers who buy gas in wholesale markets can be exposed by sudden price spikes if they are without the means to pass these on to customers.”

Our survey indicates that the most popular strategies for managing this risk are centered around market monitoring (doubtless in many cases coupled with active hedging and trading). Other more active strategies involve diversification, both geographically to different groups of customers and across fuel types.



6. Managing planning and public acceptance risk

This risk has fallen from fifth spot in last year's report, but panelists expect it to become a greater challenge by 2013, as efforts to site renewables facilities, transmission lines for renewables and transmission lines for internationally integrated grids escalate.

The issues in public acceptance can be argued to go beyond siting. As one analyst contended, an unfortunate contradiction exists in public views on utilities: public opinion is generally favorable toward "greening" measures and recognizes their importance. However, public opinion is unwilling to put up with significant price rises in pursuit of these goals. (This challenge is discussed below in regard to risk eight page 22.)

More conventional public acceptance risks revolve around siting. Experience does not necessarily lead to optimism for the future of this aspect of the risk. As an academic analyst explained, "The issue of siting new power generation plants has already been with us and increasing in importance for some time. However, there appears to be no let up in this trend while there is a reasonable chance that it will become even stronger. We are likely to encounter more cases of opposition to siting issues related to renewable generation facilities."

This results in both suboptimal siting and costly transmission lines. In the UK, for example, there has been strong opposition to onshore wind farms, which has meant that utilities are forced to construct assets at sea instead. The obstacles to getting renewable projects out of the planning phases are continuing to stay very high.

Drivers of social acceptance/CSR risks, as reported by power and utilities organizations surveyed

Ranked by frequency of mention

Rank*	Driver
1	Rise in CSR standards
2	Increasing mistrust of public sector organizations and staff

** Based on 31 responses from power and utilities respondents to our global multi-sector survey. Rank order may not reflect statistically significant differences in all cases. Unclassifiable/refused responses not shown.*

The power and utilities sector also faces public pressure in relation to corporate social responsibility (CSR). Indeed, the rise in CSR standards was the social acceptance challenge most frequently reported by power and utilities respondents in our global multi-sector survey.

This risk is likely to develop significantly over the coming three years, with a still-greater focus likely on energy efficiency and CSR. The consequences of the Sendai earthquake on the Fukushima-Daiichi nuclear power plant in Japan may have far-reaching social acceptance consequences too.

Much of the impact of this risk can be reduced by companies ensuring that a dialogue takes place between energy companies, environmental advocacy groups and the public. One analyst argued that there is not currently true public ownership of carbon targets throughout the developed world; there is a real sense of them being government targets instead. For this reason, there is considerable resentment toward them. Another analyst noted, "Stories are increasingly being publicized of nearby residents unhappy about noise and vibration of wind turbines, while some

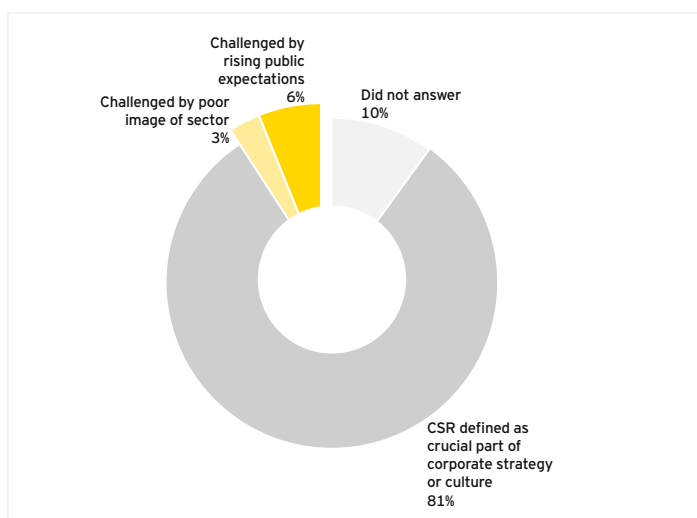


complain of visual blight on hills or the near offshore ... it bears close watching, especially given the dependence of subsidy and mandate which ultimately require public support.”

In theory, companies are attempting to overcome this issue, so that plans for renewable energy plants can go ahead. However, expanding regulatory requirements often make it impossible for utilities to gather a return on their investment, and companies are tempted to respond by documenting why they are unable to meet public goals under the existing regulatory framework. This may protect investments and reduce reputational risk, but at the same time harm the image of the sector. The ideal, though not always achievable, approach is to communicate effectively with the public and government up-front, in order to avoid regulation that sets companies up for failure.

It must be noted that despite the problems noted above, power and utilities tends to lead other sectors in its management of these risks. While other sectors feel there has been a sharp increase in public expectations in recent years, only 6% of companies surveyed thought this was the case in power and utilities. This perhaps reflects a long experience with these issues in this sector. This is further confirmed by the fact that 81% of the power and utilities firms we spoke to thought that CSR had been defined as a crucial part of their corporate strategy or culture (65% was the cross-sector average). In the power and utilities sector, integration of CSR into company strategy and organizational culture were the two most frequently reported successful approaches to mitigating this risk.

Sector responses to social acceptance/CSR risks



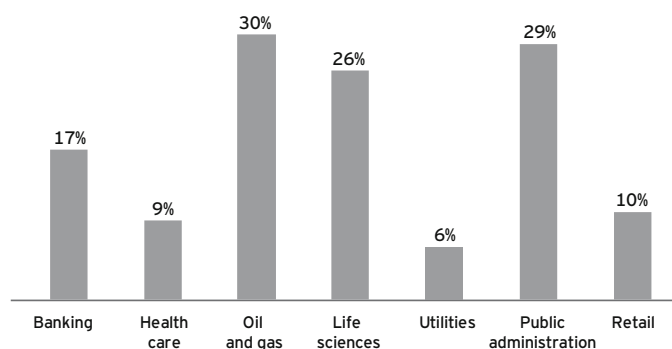
Factors mitigating social acceptance/CSR risks, as reported by power and utilities organizations surveyed

Ranked by frequency of mention

Rank*	Mitigating factor
1	Integration of CSR into strategy
2	Integration of CSR into organizational culture
3	Development of specific processes to manage CSR risks
4	Creation of competitive advantage through CSR focus

* Based on 31 responses from power and utilities respondents to our global multi-sector survey. Rank order may not reflect statistically significant differences in all cases. Unclassifiable/refused responses not shown.

Percentage reporting that public expectations have risen, by sector





7. War for talent

This is a new entry in the top 10, having appeared in last year's report as the fifth "below the radar" risk. On balance, the panelists we interviewed expect the profile of this risk to continue to rise over the next three years.

With the baby-boom generation retiring, there will be a shortage of talent at the disposal of industry in the next three to five years. There needs to be an influx of talent at all levels of the industry, and while there are many graduates, there is also rising competition for talent. The power and utilities sector is just one of a range of industries requiring graduates in hard science/engineering, and must compete with many other industries for the best talent.

This is not just an issue in Western countries, as one senior lecturer notes. Indeed, these issues arise far down the development ladder: "This is an issue in the entire energy industry but in developing countries, the distribution business faces this challenge where small-scale operators are unable to attract qualified and experienced staff for their operations."

The industry's prospects of winning the war for talent are in part limited by the fact that there are currently very few women in the industry, as one power and utilities analyst noted. Many employers note that they are struggling to diversify a predominantly male employee base. In addition, the industry has recently faced difficulty in attracting young workers. Arguably, the sector has a poor reputation of having little technological innovation, which makes it less appealing to engineering and sciences graduates.

However, according to our global multi-sector survey, the most frequently reported driver for this risk among power and utilities companies is not such macro trends, but rather an institutional lack of organizational focus on managing talent. Nineteen percent of power and utilities respondents indicate problems with internal processes; 12% indicate that the problem is based in macro trends.

Drivers of managing talent risks, as reported by power and utilities organizations surveyed

Ranked by frequency of mention

Rank*	Driver
1	Lack of organizational focus on managing talent
2	Shortage of personnel with necessary skills
3	Lack of development in talent management processes
4	Negative impacts of law or regulation on organization's ability to attract talent
5	Increased global competition for talent
6	Freeze on new recruitment impacting ability to manage talent

** Based on 58 responses from power and utilities respondents to our global multi-sector survey. Rank order may not reflect statistically significant differences in all cases. Unclassifiable/refused responses not shown.*

That said, a shortage of personnel with necessary skills is still relatively frequently reported in the sector. In many countries in the developed world, the educational needs of the sector have not been met. This requires massive investment from power and utilities companies to develop talent on-the-job, as well as lobbying governments and universities to implement more relevant education and training for students. (The third most frequently reported driver of human resources risks in the sector is that firms have neglected their talent development programs.)

Power and utilities companies require very specific skill sets with very specialized training; these requirements are not always adequately met, and as a consequence companies have difficulties finding workers with the skills and proficiencies they require. Independent consultant Dr. Martin Vasey, who was previously Power and Utilities Knowledge Director at Ernst & Young says, "Utilities need to ... develop plans and commercial relationships that will provide access to the necessary skills and resources as well as to the finance for future developments."



The impact on companies of skill shortages is considerable. The labor pool is shrinking overall, while companies will struggle to hang on to employees that are in demand. Additionally, the high rate of turnover will adversely affect companies' internal operations. A scarcity of middle managers with sector experience is also likely within the next few years.

Managing this problem will require a number of strategic shifts. Firstly, the structural problems faced by companies can be addressed by reorganization – a flattening of companies' hierarchical structures can both address the dearth of middle managers and make the organization more attractive to graduates looking for work. Secondly, companies should look inward for the talent they are seeking, widening recruitment to incorporate returning retirees, re-hires and others with expertise in specialized areas. If companies do look outside of their immediate area, they must advertise far and wide to strengthen the appeal of the sector to outsiders.

The most frequently reported successful strategy for mitigating this risk is to have a dedicated, well-developed program for managing talent. Power and utilities firms also reported managing this risk successfully by having an embedded culture of

Factors mitigating managing talent risks, as reported by power and utilities organizations surveyed

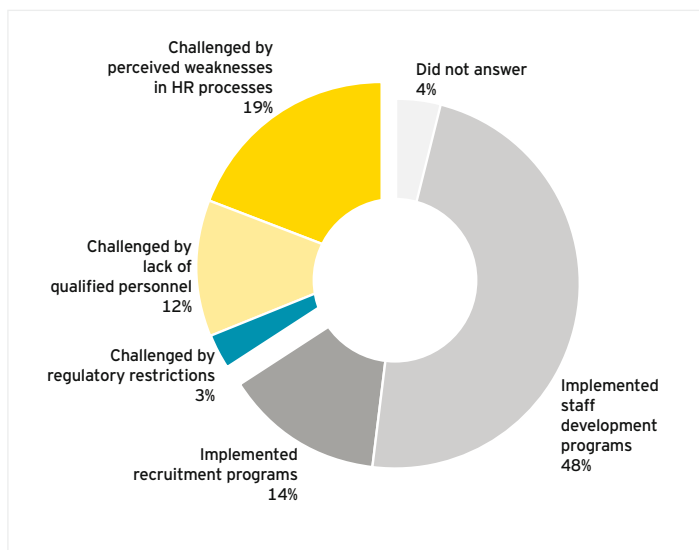
Ranked by frequency of mention

Rank*	Mitigating factor
1	Well-developed program for managing talent
2	Embedded culture of developing employee potential
3	Focus on employee satisfaction
4	Increased diversity of workforce
5	Development of an "employer brand"
6	Intensification of university recruitment programs
7	Management of risks and opportunities related to workforce aging

** Based on 58 responses from power and utilities respondents to our global multi-sector survey. Rank order may not reflect statistically significant differences in all cases. Unclassifiable/refused responses not shown.*

developing employee potential and a greater focus on employee satisfaction. However, less than half (48%) of all power and utilities firms we surveyed reported that they had implemented staff development programs.

Sector responses to managing talent risks





8. Backlash against renewable subsidies

This is a new risk on the power and utilities radar and, on balance, the panelists we interviewed expect it to become even more of a focus for companies in the next three years.

Despite recent advancements in technology, renewable energy is still considerably more expensive than other forms of power generation. For this reason, there is a concern about the ability and willingness of consumers to pay for the renewable energy capacity targets, which are set out in policy by government. Despite recent large increases in oil prices, renewable energy still needs significant government subsidy in order to remain cost-effective; as one analyst put it, “Consumers may begin to resist and governments may retreat.”

Analysts we spoke to agreed that, in the long-term, commodity prices are expected to rise, so the relative cost of renewable energy is set to fall substantially. In addition, given the recent Sendai earthquake and tsunami in Japan, there is likely to be at least a short-term public backlash against nuclear power, which could further shift emphasis to renewables.

Still, this expectation of rising prices may not apply to all commodities all of the time, as the recent gas price collapse reminds us. As one academic specialist in power and utilities regulation noted, “As gas prices fall, required subsidies for renewable energy deployment will increase and renewable energy mandates will appear less reasonable.”

Over the coming years, there are likely to be considerable reductions in the cost of new technologies related to renewable energy as new manufacturing capacity comes online in the developing world, principally India and China. However, many panelists expect that the level of returns will not change to a large degree for these technologies.

National austerity measures will also tend to make the risk of a backlash against renewables subsidies more acute.

As a specialist in energy economics commented, “The lack of commercial viability of renewable energy and its dependence on public subsidy does not augur well for an era of fiscal austerity for governments. The evidence is already emerging that renewable energy subsidies lose out in the competition for public funds.” Renewable energy subsidies can be reduced or canceled at the whim of governments facing fiscal pressures, as recently happened in Spain.

William Blyth, Director of Oxford Energy Associates, notes that companies investing in renewable energy need to be aware that political drivers can result in rapid and unpredictable changes to the regulatory environment. Feed-in tariffs can be impacted by such trends, according to a senior energy executive: “When fully weighted, the costs of such policies place unnecessary burden on the rate base which could often, at least in part, be met through market-based mechanisms.”

The impact of such a backlash is likely to impact investor confidence in the sector. Renewables investments include large costs for transmission infrastructure, which will also have to be maintained. This is a cost that was not previously considered inherent in renewables, but may well be unavoidable.



To reduce this risk, companies must monitor the public mood, and try to ensure that investments in large-scale renewable projects are protected. Given that the public discourse takes place largely outside the realm of the power and utilities industry itself (and is heavily influenced by current events) there is little else power and utilities companies can do to directly influence this risk.

Power and utilities companies must also ensure that they have provided investors with accurate information as to the true extent of their investment, and their likely returns over time. This may help investors anticipate the movements of governments – although much of this risk is dependent on the vagaries of politics,

There is a genuine concern among panelists and governments alike that current investment returns in renewable energy may not persist in the long run.



9. Inefficient use of low-carbon technologies

This risk appeared in seventh place in last year's report, but falls two places to ninth this time around. Analysts expect the risk's impact on the sector to be roughly unchanged in three years' time.

Low-carbon technologies – by which we mean renewable energy and nuclear energy, coupled with carbon capture and storage (CCS) for conventional fuels – are widely considered to be a major source of power generation in the future transformed power and utilities industry. However, there are considerable inefficiencies in how these technologies are being optimized and deployed.

Our global multi-sector survey indicates that a failure to develop an innovation culture is the leading driver for this risk reported in the power and utilities sector, while a lack of investment in innovation is the third most commonly reported driver. Sandwiched between those two drivers is the inherent uncertainty around untested emerging technologies, which creates considerable risk.

Low-carbon technologies have sometimes proved more costly than expected, even though the cost of renewable energy continues to decrease. Globally, the large-scale implementation of these technologies is relatively novel, and like any developing area, the supply chain is not fully developed yet – there are efficiencies that can be reduced, and the technology itself will be subject to future improvements. In the last five years, governments have realized the expense of wind power, which can be two to three times more expensive than traditional fossil fuel-generated power, according to one analyst we interviewed. Solar power can also face inefficiencies in terms of load factor.

Another driver of financial inefficiency in the implementation of wind and solar power is their intermittent nature. For instance, there is significant uptake of photovoltaic technology in Germany, but it may not be the most efficient long-term use

Drivers of emerging technologies risks, as reported by power and utilities organizations surveyed

Ranked by frequency of mention

Rank*	Driver
1	Failure to develop an innovation culture or processes
2	Inherent uncertainty in untested emerging technologies creates strategic challenges
3	Insufficient investment in innovation

** Based on 36 responses from power and utilities respondents to our global multi-sector survey. Rank order may not reflect statistically significant differences in all cases. Unclassifiable/refused responses not shown.*

of capital, according to some panelists we interviewed. That said, breakthroughs in energy storage could create compelling solutions to these problems.

Inefficiencies can arise from the specificities of particular regulatory frameworks, which often sit uneasily in relation to carbon markets. The recent Energy Market Reform process in the UK seeks to address some of the issues around the predictability of investment returns through proposals for capacity payments and a carbon price floor.

Attempting to integrate new generation technologies into markets creates risks that may be underappreciated. As a senior executive in the sector notes, "There have been recent incidents when there is excess supply of wind power relative to demand. This leads to zero (or even negative) spot prices for power during those periods" (although again, storage technology breakthroughs could address such problems in the future). Another energy executive notes, "The electric power system is increasingly controlled via decentralized mechanisms (e.g., Regional Transmission Organizations and organized power markets in the US). A lack of understanding about the role of power markets plagues many would-be and new entrants to the cleantech space."



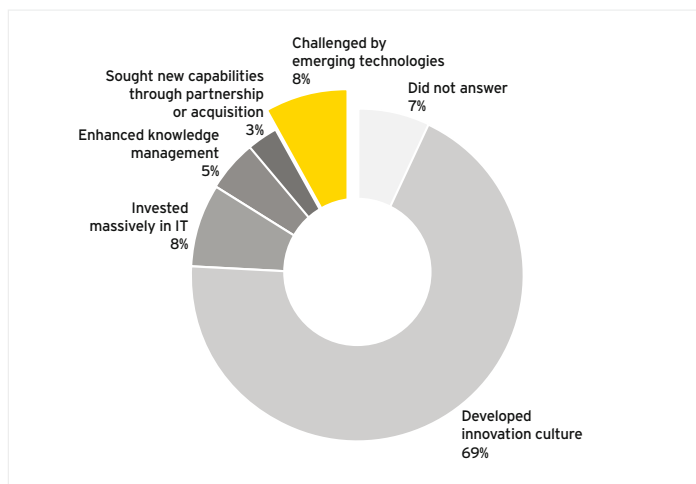
Another source of inefficiency is the rapid take-up of some low-carbon solutions. As another executive commented, “Supply chains for renewable energy are not deep enough to absorb large changes in the rate of installation of renewable energy projects without affecting the unit costs. Strong renewable energy support policies have generally been followed by strong increases in installation costs.”

In response to these risks, companies are changing the way they allocate capital. Faced with policy uncertainty, some power and utilities companies are seeking diversity around generation technologies. This is partly due to the fact that governments are also becoming more selective about the subsidies they offer for use of low-carbon technologies.

Greater conservatism is not the only answer. Sixty-nine percent of all power and utilities firms we surveyed say they have implemented an innovation culture (this is the highest among any of the seven sectors we surveyed). Other popular risk mitigation strategies include continuously monitoring the latest technologies in order to make informed decisions about investments.

Over time, scale will help renewable energy become more efficient. One analyst explains, “Renewables would become more effective if their intermittency could be offset by linking up larger

Sector responses to emerging technologies



Factors mitigating emerging technologies risks, as reported by power and utilities organizations surveyed

Ranked by frequency of mention

Rank*	Mitigating factor
1	Continuous innovation of manufacturing processes
2	Continuous monitoring of new technologies
3	Continuous innovation of products and services
4	Investment in IT systems
5	Organization-wide prioritization of IT
6	Investment in staff with IT expertise
7	Merger or acquisition to gain key technological capabilities

* Based on 36 responses from power and utilities respondents to our global multi-sector survey. Rank order may not reflect statistically significant differences in all cases. Unclassifiable/refused responses not shown.

geographic areas. This can be done by reinforcing transmission grids so as to be able to transport electricity from areas where the wind is blowing to areas of demand.”



10. Economic shocks and resulting short-term energy demand shocks

This is a new risk on the 2011 radar, although on balance, panelists expect it to fall in its impact on the sector over the next three years.

The global economy has proved tremendously volatile in the last 36 months, and even now a double-dip recession is still a significant possibility in many geographies. As Desmond Lachman of the American Enterprise Institute notes, “The global economic recovery will continue to be among the weakest in the post-war period.”

Having said that, economic shifts do not always impact the sector strongly, which is why this risk has not previously appeared on the radar. What specific effect the contraction in the economy is likely to have on the energy market is dependent on the country’s level of energy efficiency, and whether or not the country in question is highly industrialized. The systemic impact of energy efficiency is also likely to have a big impact in the future. In countries with less exposure to manufacturing industry, such as France, a decrease in energy demand resulting from a recession will be much lower. However, in Germany and Eastern Europe, shifts in aggregate demand will be much more keenly felt in the power sector, as industrial production slows down. The less industry there is in a company, the less volatile energy demand in that country is. As noted by one Ernst & Young professional, for developed economies, the effect tends to be close to unity: a 1% fall in GDP will result in approximately a 0.9% contraction in energy demand. However, for developing economies such as China, the figure is likely to be closer to 1.5%.

More than economic shifts, the weather can have a major influence; cold weather will raise demand noticeably in a country or region.

Drivers of slow recovery/double-dip recession risks, as reported by power and utilities organizations surveyed

Ranked by frequency of mention

Rank*	Driver
1	Rise in competition in the sector, and associated downward pressure on prices
2	Decrease or stagnation in private sector demand
3	Dependence of the sector on declining government spending
4	Economic impact of national austerity measures

** Based on 21 responses from power and utilities respondents to our global multi-sector survey. Rank order may not reflect statistically significant differences in all cases. Unclassifiable/refused responses not shown.*

When aggregate demand is mostly stagnant or declining, there may be less need for power and excess generating capacity. As one commentator noted, “The weak and fragile economic recovery in the industrialized economies has reduced gas demand for industry and electricity generation.” In our global multi-sector survey, the most serious driver of economic risks among power and utilities companies was thought to be the downward pressure on prices, which could be caused both by rising competition and economic shocks. Lack of private sector demand and the dependence of the sector on declining government spending are the second and third most commonly reported drivers of this risk, respectively.

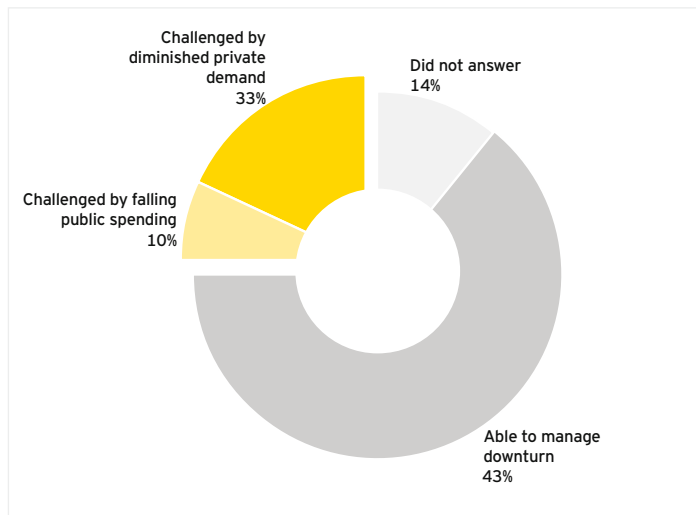
Much of the exposure of power and utilities firms to this risk comes as a result of the delivery of large capital spending programs. As a result, companies have large fixed costs, which exacerbate the impact of future economic shocks on profitability. Governments recognize that the level of investment within the sector can be undermined by exposure to economic risks.



To mitigate this risk, our global multi-sector survey shows that supply chain efficiency is the main strategy favored by power and utilities companies (bearing in mind that rising competition is more often a focus than economic shocks).

Other key strategies employed by companies include adjustments to pricing strategy and well-developed finance functions. Despite its low position on the risk radar, 43% of power and utilities firms surveyed said they had been challenged by economic conditions in recent years, with 33% focused on private demand weakness and 10% focused on collapsing public spending.

Sector responses to low recovery/double-dip recession




Factors mitigating slow recovery/double-dip recession risks, as reported by power and utilities organizations surveyed

Ranked by frequency of mention

Rank*	Mitigating factor
1	Increase in supply chain efficiency
2	Adjustments to pricing strategy
3	Well-developed finance function
4	Expansion of customer reach

* Based on 21 responses from power and utilities respondents to our global multi-sector survey. Rank order may not reflect statistically significant differences in all cases. Unclassifiable/refused responses not shown.



Part 2: opportunities

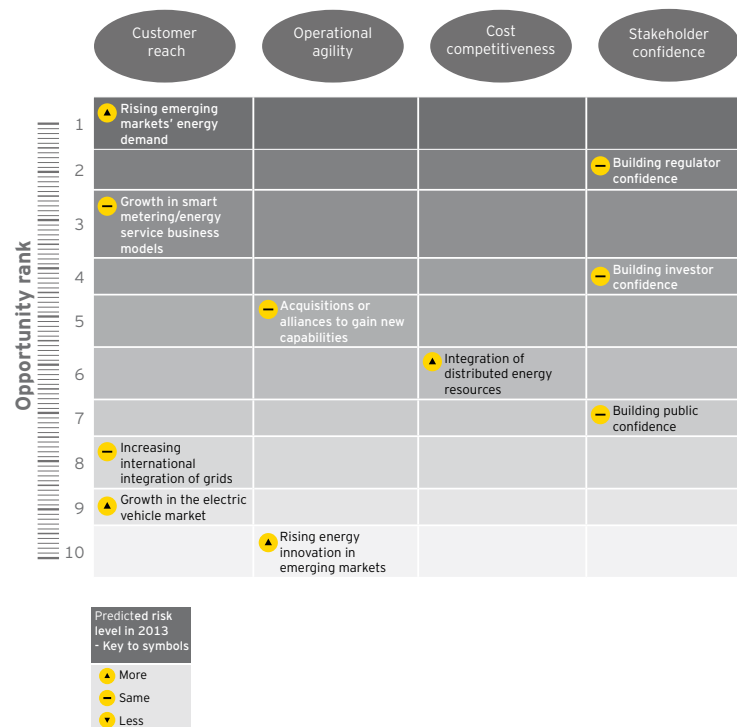
Ernst & Young opportunity ladder

The opportunity ladder presents a snapshot of the top 10 opportunities for companies in the power and utilities sector.

The opportunities at the top of the ladder are those that the commentators we interviewed thought would have the greatest impact on power and utilities companies' performance in the years ahead. Arrows indicate whether the executives thought the potential performance impact of the opportunity would rise or decline by 2013.

The ladder is divided into four sections. These represent the four drivers of competitive success identified in our *Competing for growth* research. This study showed that successful companies – the top quartile in both revenue and EBITA growth – have focused on executing four drivers of competitive success:

- ▶ Customer reach – to optimize their potential market
- ▶ Operational agility – to maximize their effective response
- ▶ Cost competitiveness – to optimize their profitability
- ▶ Stakeholder confidence – to secure both talent and support for achieving their goals



The top 10 opportunities

1. Rising emerging market energy demand

The global economy has shifted markedly to the East in recent years. Emerging markets such as China and India are widely tipped as economic superpowers of the future. Although this is the largest opportunity for the sector in 2011, the panelists we interviewed expect the opportunity to continue to grow by 2013.

Demographically, emerging markets dwarf developed economies. This should eventually feed through into economic activity, now that “policy-makers and the international development community have a better understanding of what it takes to put a poor country onto the path of rapid structural change,” as one political analyst we interviewed put it.

Electricity generation cannot keep up with demand in many of these fast-growing countries; in China, for example, approximately 40GW of power will come on line in the next year alone, and this rate of increase will continue for the foreseeable future, as the country becomes more and more industrialized. As an energy analyst commented, “Rapid economic growth in China, India and South America increase the demand for energy – coal, oil and gas.”

Many countries have gone through varying degrees of market liberalization, making participation by international firms possible. That said, regulated utilities in the developed world are often forbidden to engage in international expansion.

For that reason, many of the power and utilities firms exploiting this opportunity will be from other emerging markets. Indeed, in many emerging markets, the market liberalization process started well before those in more developed countries, such as Western Europe and the United States. In Asia Pacific, a reaction to the

Challenges to emerging market demand growth, as reported by power and utilities organizations surveyed

Ranked by frequency of mention

Rank*	Challenge
1	Tendency to focus on home markets following setbacks in Asia
2	Inability to turn market share into profit in emerging markets
3	Lack of market-specific expertise
4	Weaknesses in internal communication limiting effectiveness

** Based on 54 responses from power and utilities respondents to our global multi-sector survey. Rank order may not reflect statistically significant differences in all cases. Unclassifiable/refused responses not shown.*

regional crisis was an injection of capital into various countries by the IMF, on condition of market liberalization in the power and utilities sector. A similar phenomenon occurred in Latin America; Mexico, Argentina, Brazil and Chile all opened their markets to competition in the late 1990s; many countries in Africa also have in the years since then.

As a result of this liberalization process, both generation infrastructure and distribution network infrastructure become a big investment opportunity within utilities. In fast-growing developing countries, growth in power demand is unlikely to slow down within the next three years, particularly in China, India and Africa (where GDP growth averages 6% across the continent).

However, another key implication of liberalization and growth is the existence of many “national champions” of the power and utilities sector, which are in some cases protected by regulation in their home markets. These companies are branching out from their region, looking for stability and diversity in their portfolio.



To take advantage of this opportunity, companies must have “on-the-ground” knowledge of emerging markets. This allows companies to make good decisions about investments. Many Western companies have struggled with this – our global multi-sector survey shows that many companies are concentrating on their home market after setbacks in Asia, or other emerging markets. Indeed, some 31% of power and utilities respondents in our survey report that they have not reaped the gains they expected from emerging markets.

Yet despite the challenges, international expansion is still seen as an imperative by many survey respondents. Rising competitive pressures in home markets are the number one reason for this. The most frequently reported successful strategy for penetrating emerging markets is to increase flexibility and responsiveness.

Going forward, Africa may be the next frontier for utilities investment. What is notable about investment in Africa is that much of the investment capital has come from other emerging markets. Chinese companies, for example, are building infrastructure across sub-Saharan Africa, while Russian companies are financing new infrastructure projects in Namibia. There is a broader framework to these ventures; in many cases, companies are securing their own power for natural resources investments, or offering infrastructure investments in exchange for resource access. However, the African continent has benefited in the last 10 years from increasingly democratic governance, freedom of press and association, and lower levels of corruption. This is likely to continue to be the case over the coming years, and

Factors enabling emerging market demand growth, as reported by power and utilities organizations surveyed

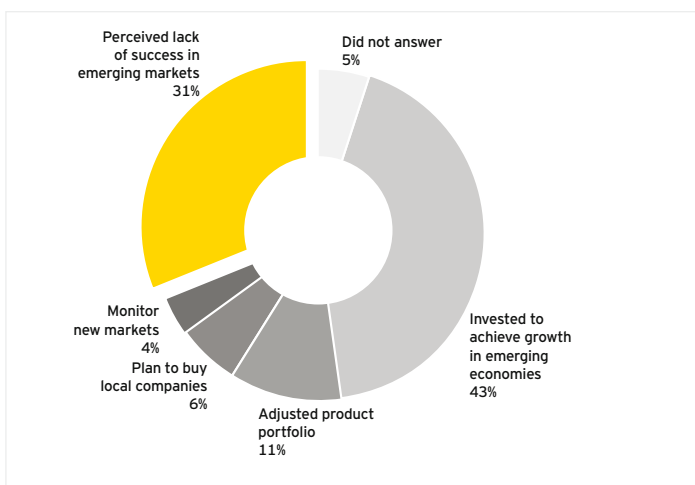
Ranked by frequency of mention

Rank*	Enabling factor
1	Rising competitive pressure in home markets
2	Reduction in product life cycles to increase responsiveness
3	Rapid market growth in Asia
4	Focus on taking market share from competitors
5	Investment in innovative local companies in emerging markets
6	Growing business opportunities in Eastern Europe and Scandinavia
7	Flexible strategy for different markets
8	Monitoring of emerging market customer needs
9	Development of an Asia-specific strategy

** Based on 54 responses from power and utilities respondents to our global multi-sector survey. Rank order may not reflect statistically significant differences in all cases. Unclassifiable/refused responses not shown.*

power shortages are predicted in many African regions.

Sector responses to emerging market demand growth





2. Building regulator confidence

As already noted in the commentary on risk two (Compliance and regulatory risks), regulators define the rules of the game by which power and utilities companies play. This is an unchanging phenomenon and the panelists we interviewed expect no change in the scale of this opportunity by 2013.

Regulators and power and utility companies, to an extent, have the same goal – to deliver power and water to the public at the lowest cost possible and the highest reliability possible. As one analyst said, “The more they work together, the better they are.” A big challenge for power and utilities companies is to get regulators on their side, and prevent infeasible regulatory hurdles from cropping up. Through dialogue and transparency, power and utilities companies can convey to regulators that they share common goals, thereby improving regulatory certainty and consistency.

Particularly in emerging markets, regulator confidence will emerge as an issue over the next few years. If the regulators feel they are able to trust utility companies, regulation is likely to be more flexible. At this formative stage, the rules of the game are still being set in emerging markets, and regulation is not necessarily as transparent as in the West.

In developed markets, regulatory models are now relatively mature, which allows regulators to use longer review periods, saving costs and improving regulatory certainty.

One driver of this opportunity over the next few years is likely to be “green growth” initiatives. While attended by risks, these initiatives see low-carbon technologies as a source not only of emissions reduction but also the development of national competitive advantage. This opens a wider range of cooperative possibilities, such as government-sponsored “green” investment banks. As William Blyth, director of Oxford Energy Associates says, “Renewable investment is being driven by ambitious renewable energy targets, introduced for a combination of environmental and industrial policy reasons.”

The benefits enjoyed by companies as a result of this opportunity are obvious. It potentially reduces the risk of hindsight disallowances from state regulators, increases the likelihood of the company being seen in a positive light by its customers and enhances the commercial returns from subsidies (e.g., for renewables).



The usual, and right, response to this opportunity has generally been to make sure the regulator is aware that the company in question is proactively looking to comply with regulation, and to ensure lines of communication are kept open between the two parties. This communication is key in many different areas of negotiation; as Dr. Martin Vasey notes,

The other thing companies can do is to make sure the utility is able to document its performance in terms of the issues beyond cost, such as security and efficiency, that regulatory bodies increasingly consider part of their remit. This will be a key point of action for power and utilities companies over the next three years.

“Now is a good time to agree necessary infrastructure investments with the regulator while negotiating creative ways that these can be introduced into rates to avoid ‘rate shock’ to the consumer.”

3. Growth in smart metering/energy service business model

Smart meters are designed to promote responsible energy usage by informing the customer exactly how much electricity he or she is using on a real-time basis. The industry's awareness of smart metering has increased markedly in the last two to three years, and companies are focusing on the topic more and more, promoting the technology to consumers. Smart metering is an essential enabler for the industry transformation, but evidence suggests that behavioral change by consumers will only come about through more sophisticated energy management services. (Nonetheless, on balance, the panelists we interviewed expect the scale of the opportunity to remain roughly constant over the next two to three years.)

The establishment of smart metering in homes is likely to allow a new communications channel to open between the utility and its customers. This is the first real benefit of smart metering. Consumers are expected to be much more proactive about their energy consumption, while companies will be able to bill on actual, rather than estimated energy consumption.

There will also be further benefits to companies when customer-related processes, such as billing and meter reading, are restructured. The technology is likely to fundamentally change the retail aspects of companies' businesses, with new call centers and IT processes to be adopted.

The technology also opens up opportunities for businesses to enable new services and products. Smart meters are necessary to meet energy efficiency goals, but the rollout of smart meters to customers will not by itself enable a power and utilities firm to tap into new growth markets.

Taking full advantage of this opportunity will require significant innovation in products, services and operations. In our global multi-sector survey, the challenge to taking advantage of innovation-based opportunities most frequently identified by power and utilities respondents, was insufficient focus on investment. Also, some respondents in the sector lamented their lack of specific expertise in this emerging area, or that their organization was too conservative.

Challenges to innovation in products, services and operations, as reported by power and utilities organizations surveyed

Ranked by frequency of mention

Rank*	Challenge
1	Insufficient focus or investment
2	Lack of specific expertise or knowledge
3	Organization is too conservative
4	Insufficient strategic or organizational flexibility

** Based on 61 responses from power and utilities respondents to our global multi-sector survey. Rank order may not reflect statistically significant differences in all cases. Unclassifiable/refused responses not shown.*

One potential area of innovation is energy-related services. These services involve helping customers to save energy, or use energy when it is cheaper (at times of low demand). There may also be scope for new products in conjunction with the health care or security industries, as smart meters can be programmed to do more and more in the future. As one executive we interviewed commented, new business models will emerge offering energy-related services, not just commodity resale.

Looking forward, much will depend on specific countries and their regulatory environments. There remain substantial disagreements about how regulatory and technological frameworks to support smart meters should be implemented. The key for companies, according to one executive, is for the sector to "transition to a model where the end-user is capable of participating in real-time pricing in an automated fashion. Such a transition will mark the beginning of the actual 'revolution' which has been promised but remains undelivered." The chairman of an energy consultancy argued: "Command and control paradigms for the 'smart grid' may meet near-term operational challenges, but will quickly lose value when compared to decentralized approaches as renewable resources, electric vehicles and distributed generation stress the grid."

However, in all countries, power and utilities organizations are at least conducting pilot schemes. Indeed, the sheer number and variety of pilot schemes has made it difficult to extract consistent data from which strong conclusions can be drawn. Nordic



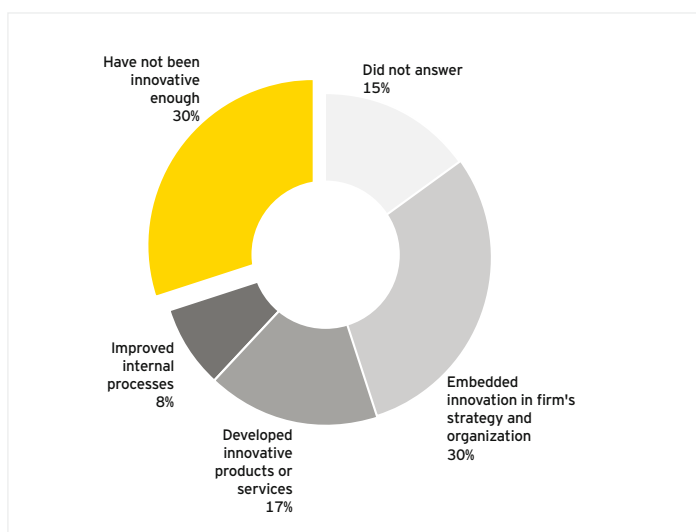
countries in particular are more advanced in this area, and take-up of the technology in northern Europe is higher than elsewhere.

The most-frequently reported strategy enabling power and utilities companies to take advantage of innovation opportunities is to implement a culture of continuous innovation across their organization. The second-most frequently reported approach is the structured monitoring and investigation of future consumer needs.

Successfully grasping this opportunity will require a clear vision as to how this emerging technology can be implemented. As one analyst put it, "Businesses, especially those related to electricity, need to be careful about becoming focused on a static conception of complex systems like the smart grid. Technologies and processes will be every bit as important, if not more important, than components at the generation level of behind the meter."

Companies are instead promoting the technology on a piecemeal basis in many cases, often as an expensive option for consumers. In addition, there has not been the expected cooperation with firms in other industries, such as telecoms. While this is happening to a small extent, larger collaborations were expected. Power and utility companies may be able to gain from the customer-focused perspective of telecoms companies.

Sector responses to innovation in products, services and operations



Factors enabling innovation in products, services and operations, as reported by power and utilities organizations surveyed

Ranked by frequency of mention

Rank*	Enabling factor
1	Organization-wide strategy of continuous innovation
2	Monitoring and investigation of future consumer needs
3	Well-established processes for managing innovation
4	Development of culture of innovation
5	Investment in renewable energy
6	Investment in new markets, products, brands and services
7	Creating innovation partnerships with competitors

* Based on 61 responses from power and utilities respondents to our global multi-sector survey. Rank order may not reflect statistically significant differences in all cases. Unclassifiable/refused responses not shown.

Despite the challenges, many panelists we spoke to remained convinced of the scale of the opportunity, which is why it appears second on the radar. As one energy executive stated,

“Demand assets are an extremely important part of the electric power system which currently remain grossly underutilized and underdeveloped.”

4. Building investor confidence

Large-scale investment in infrastructure, especially as the demand for renewable forms of energy increases over the next few years, is becoming increasingly important. For this opportunity to be realized, power and utilities companies will have to convince investors that profits are appropriate to the risks being faced. Companies that can do so should be more likely to be able to execute and benefit from the large-scale investments required – an opportunity that panelists we interviewed expect to remain stable in the coming years.

Our multi-sector survey indicated that the most frequently reported challenge for power and utilities companies attempting to capitalize on this opportunity was internal – a poorly-defined strategy for managing investor relations. In the power and utilities sector, issues such as the uncertainty surrounding the current cap-and-trade policies have surely had an impact on investment levels as well.

The attraction of infrastructure funding, of course, depends in the first instance on the risk-adjusted returns for investors, and so regulators, as well as companies, have a responsibility to create investment opportunities that are sufficiently attractive. For this to happen, countries need to have clear policy and detailed regulation in place. This will deliver accurate pricing mechanisms for carbon trading; much more attention needs to be paid to the ongoing pricing mechanisms if governments are to be confident they can attract investors.

Some panelists we interviewed were scathing in their criticism of failures of market-based carbon pricing mechanisms. The shortcomings of this model have arguably been seen over the past few years, as its track record in terms of delivery of investment is fairly poor. Much more interventionist and direct subsidy and support from governments linked to very clear policy regulations and guidelines would give more confidence to potential investors, panelists argued.

Challenges to excellence in investor relations, as reported by power and utilities organizations surveyed

Ranked by frequency of mention

Rank*	Challenge
1	Poorly defined strategy for managing investor relations
2	Failure to prioritize investor relations

** Based on 39 responses from power and utilities respondents to our global multi-sector survey. Rank order may not reflect statistically significant differences in all cases. Unclassifiable/refused responses not shown.*

One executive in the sector claimed,

“Investors are unlikely to rely on price signals they’re not in control of,”

One area where investment is certainly needed is in offshore developments. The scale of infrastructure required to get such developments up and running is considerably bigger than other types of energy infrastructure. This may provide opportunities in the future, as an independent consultant explained: “Offshore developments have many advantages; the size of developments makes them more attractive to infrastructure investors ... Security of revenues and robust infrastructure development will be important preconditions for success.”

It is also important that companies and governments deliver on their promises if they hope to attract future investments. As one chairman of an energy firm notes, “Non-performance of energy efficiency projects is likely to temporarily taint such products or services, given some of the current offerings. If such risks are not mitigated, investor confidence may be damaged and impede sector growth further.”

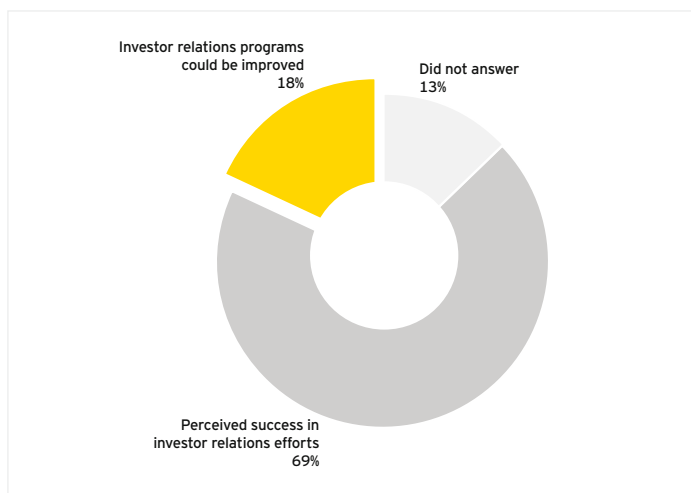


Our global multi-sector survey finds most (69%) of power and utilities companies reporting that they have successful investor relations programs. (However, this is lower than other sectors, where the comparable figure is closer to 80%.)

According to the power and utilities companies we surveyed, the factor crucial for success in investor relations is organizational focus: either an explicit prioritization within an organization to enhance investor relations, or a desire to improve credit ratings (no doubt stemming in many cases from the bond issuance strategies that many power and utilities companies have used to raise capital in recent years).

Many companies report a micro approach to investor relations: clearly setting out the financial advantages of projects, as well as the risks presented by current legislation, in their communication with investors. Another approach to attracting capital to the sector is to focus on the big picture, by opening lines of communication with regulators and encouraging the implementation of investor-friendly regulation.

Sector responses to excellence in investor relations



Factors enabling excellence in investor relations, as reported by power and utilities organizations surveyed

Ranked by frequency of mention

Rank*	Enabling factor
1	Organizational priority to enhance relations with investors
2	Desire to improve organization's rating
3	Desire to improve image and reputation

* Based on 39 responses from power and utilities respondents to our global multi-sector survey. Rank order may not reflect statistically significant differences in all cases. Unclassifiable/refused responses not shown.

5. Acquisitions or alliances to gain new capabilities

While mergers and acquisitions (M&A) activity has declined globally, many strategic opportunities for power and utilities firms require the development of new capabilities. Examples include new energy services business models and implementation of low carbon technologies. Hence it is little surprise that the panelists we interviewed expect either acquisition or alliance, in order to gain such capabilities, to be a relatively constant opportunity in years ahead.

Many companies in the sector have a lack of experience in M&A deals, according to our global multi-sector survey results. This is the most frequently reported challenge that limits power and utilities firms' ability to capitalize on this opportunity. The second most common challenge is a perceived lack of appropriate opportunities for M&A activity.

On a purely financial level, new sources of capital have been needed within the industry over the last few years to accommodate large-scale infrastructure projects. For this reason, companies have had to change the way they do business; both covering their risks to a greater extent and forming alliances to enable them to deliver what investments they need. A good, but by no means the only, example is the case of nuclear capacity in Switzerland, where the present physical plant is reaching the end of its life. All four utilities operating in the country, despite being competitors, have cooperated because they need to raise sufficient capital to replace the current fleet of nuclear power plants. Of course, such initiatives in many countries including Switzerland have now been thrown into doubt by the crisis at the Fukushima Daiichi nuclear power plant in Japan.

Challenges to mergers and acquisitions, as reported by power and utilities organizations surveyed

Ranked by frequency of mention

Rank*	Challenge
1	Lack of experience in M&A deals
2	Lack of appropriate opportunities
3	M&A responsibility lies with parent company
4	Lack of perceived value in merger or acquisition

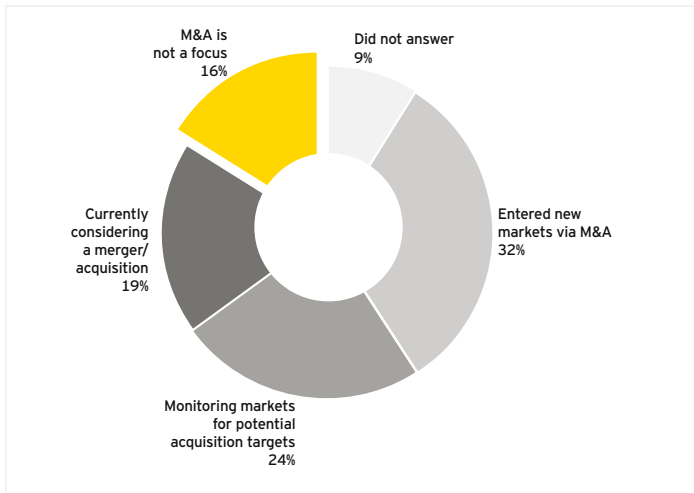
** Based on 37 responses from power and utilities respondents to our global multi-sector survey. Rank order may not reflect statistically significant differences in all cases. Unclassifiable/refused*

New technologies also demand new capabilities. As an executive in the sector notes, "Developments such as smart metering coupled with a regulatory-driven opening up of retail gas and electricity markets has led a number of supply companies to develop dual fuel offerings to increase their market share." For many companies, delivering such offerings effectively requires new alliances. In addition to alliances for marketing purposes, alliances to benefit from shared expertise and capabilities may also be beneficial to companies.

Power and utilities companies may use acquisition to move into different areas based on the changing regulatory and industry landscape. As Dr. Martin Vasey explains, "All companies [are] examining what they want their core business to be. As a result, many companies are disposing of, or considering disposing of, assets such as transmission systems, distribution systems and gas operations. Equally, many small renewable operations are looking to be acquired by larger operators. Now is the time for companies to decide what they want to become ... [and] focus on that core capability."

Our survey results indicate that power and utilities firms are more likely to use M&A activity to move into new products and services markets rather than new geographies. In addition, many companies are searching continuously for opportunities to acquire other firms based on defined profiles. However, just one-third (32%) of power and utilities firms we surveyed reported that they had executed M&A deals, which was low in comparison to other sectors, where the figure tended to be closer to 40%.

Sector responses to mergers and acquisitions



Factors enabling mergers and acquisitions, as reported by power and utilities organizations surveyed

Ranked by frequency of mention

Rank*	Enabling factor
1	Acquisition or merger to enter new product and service markets
2	Continuous searching for opportunities based on a defined profile
3	Enhanced capability to analyze concrete M&A opportunities
4	Acquisition or merger to enter new geographical regions
5	Ongoing discussions regarding merger proposal with counterpart
6	Offer made to organization

* Based on 37 responses from power and utilities respondents to our global multi-sector survey. Rank order may not reflect statistically significant differences in all cases. Unclassifiable/refused responses not shown.

6. Integration of distributed energy resources

Distributed energy resources (DER) systems are likely to be among the highest growth areas in the sector within the next five years. DER systems are small-scale technologies, used to provide an enhancement of traditional systems. DER includes distributed generation (DG), but also other forms of energy, such as heat. The obstacle to widespread take-up of DER systems has always been their cost. However, the price of solar photovoltaic panels, for example, continues to fall; indeed,

Capital costs are falling to such an extent that in the next year or two we might reach grid parity for prices of energy from panels.

Eventually, the end-user cost may actually be better for those installing solar panels, or other DER systems. In addition, from a purchaser's perspective, the lack of a transmission requirement makes the power source considerably more reliable, if intermittent in terms of output. Looking forward, the panelists we interviewed, on balance, expect this opportunity to grow in its impact on the performance of power and utilities companies.

Major changes to transmission and distribution networks must be made, with the introduction of smart grids being the main priority in this area. These will allow efficient use of both conventional power and distributed energy resources, and will enable consumers and companies to achieve the greatest energy savings. One key obstacle to overcome is achieving a level of coordination that enables the development of smart grids. At present, as an academic analyst noted, "There is no clear conception of what smart grids should be and should do."

In addition, effective approaches to managing DER assets, which

are significantly different from traditional electricity generation, have not evolved yet. The monetization of such assets is very important for power and utilities companies, which, as one of our panelists noted, currently lack the ability to procure such resources in the way in which many commercial generation alternatives can.

Other emerging technologies may also play a large part in the grid of the future. For instance, another academic analyst commented, "Electric vehicles will provide valuable storage for renewable output. The storage is especially beneficial to these technologies and will help close the gap in costs with conventional sources. Optimal exploitation of this storage will require intimate collaboration between suppliers of electricity, suppliers of ICT systems and protocols and vehicle manufacturers." (For more commentary on electric vehicles, see page 43.)

Distribution automation will also be one important element of the network modernization that emerging technologies will require. As a senior energy executive notes, "Distribution automation is likely to be one of the highest growth areas within the next five years. Return on investment and positive reliability impacts are large here."

Of course, it is important to note that DER systems may also pose a risk. In the long term, generation companies may suffer severely depleted sales if it becomes cost-effective for people to generate their own electricity.

Conversely, companies that are innovative in their approach to customers may see big rewards here. In addition, the required modernization of electricity networks will create tremendous opportunities, as existing systems were designed for non-market electricity systems based on large conventional generation plants.



7. Building public confidence

This opportunity has developed over the last 10 years as companies have increasingly raised their public profile, particularly with the introduction of energy efficiency programs. Despite this, the relationship between the public and the power and utility companies has not fundamentally changed over the last few years. While companies are seen as being more active than they once were, public opinion can still border on mistrust, which is a significant barrier to the industry transformation. On balance, the panelists we interviewed expected this opportunity to remain relatively constant to 2013 in its potential impact on company performance.

Some markets have undergone deregulation, with utilities being opened up to competition in the process. As this happens, brand becomes considerably more important. Along with other brand characteristics, issues such as CSR will influence public decisions over where to buy their power. Indeed, in many sectors, the importance of CSR is rising significantly (although as noted in relation to risk six above, the power and utilities companies we surveyed felt the level of public pressure on utilities had not shifted in recent years).

In both deregulated and monopoly markets, CSR can pay off in terms of relations with regulators as well as consumers. Regulators may well be less likely to act against a company with a good public reputation.

The response to this opportunity from companies is, as expected, to play up their efforts to be socially responsible corporate entities, with initiatives based around reducing their carbon

footprint, increasing efforts to expand into renewable energy and saving energy overall. Competition has transformed the industry in many geographies. There is a continued influx of people from other industries who are adept at the political and marketing side of operations.

The UK has changed its approach to regulation over recent years to focus much more on public consultation. The regulatory process is now promoting dialogue with the customer. However, this does present its own difficulties – customers are often unable to understand much of the vocabulary through which utilities communicate, and may lack understanding of many of the business and technical processes involved. As a result, there is a need to change the way they communicate in order to present a convincing case to customers on vital issues in this sector.

Going forward, the issue of whether this opportunity will continue to increase in the future depends, in part, on how widely and how quickly the industry deregulates (or indeed, if it does at all). Another factor may be the expected emergence of a market for energy services.

As these markets grow, utilities may need to be even more customer-focused than they currently are, and public confidence may prove to be even more crucial as a determinant of corporate performance.

8. Increasing international integration of grids

Arguably, the increasing international integration of electricity grids is one of the key utilities infrastructural developments of the next decade. As one chairman of a leading energy firm explained,

That said, the panelists we interviewed expected no change in the scale of this opportunity over the next two to three years, reflecting some pessimism about the regulatory measures needed to realize this potential.

“Increased capacity at the transmission level is a major opportunity. This is beneficial to the larger power system in a number of ways and helps increase the viability of intermittent resources like wind.”

The extent to which this opportunity can be exploited will vary significantly by region. In the US, opportunities will be few and far between. The only potential opportunities for companies will be through M&A, which may enable companies to achieve sufficient scale to make investments of the magnitude required. However, they are unlikely to be able to rely on subsidies to do so.

In Europe, however, efforts are progressing: the aim is for a fully integrated energy market enabling gas and electricity to flow between Member States and to link Europe to diversified supply sources by 2020.

Even in Europe, though, significant planning problems may be another factor preventing rapid development of an internationally integrated grid. However, according to one energy analyst we interviewed, “A likely trend in the coming years is that, recognizing this problem, policy-makers will introduce measures to streamline and simplify the planning process for grid expansion projects.”

The impact of this opportunity is increasingly being recognized, both by companies and regulators. Connectivity with adjacent markets provides increased efficiencies and reliability to both parties. Demand peaks and failures can be balanced far more easily with network integration and cross-market trade.

On a worldwide level, the geographical gap between where power is generated and where it is needed may open opportunities not only for international investment, but also for grid integration. For instance, the proposals to generate solar power in desert regions and then transmit this to centers of high demand. The companies that will exploit this opportunity are likely to be on the front lines of this operation, in anticipation of the simplification of planning processes and other barriers.

Finally, the not insubstantial diversification benefits inherent in this opportunity should be noted, for those companies that are not prevented by regulation from undertaking such measures. Power and utilities companies will be able to operate in more than one country, thereby spreading political, regulatory and overhead risks.

9. Growth in the electric vehicle market

Although technical progress in electric vehicles has been considerable over the last few years, looking forward, the pace of progress is set to increase even further, and key hurdles should be cleared. Unsurprisingly, the panelists we interviewed expect this opportunity to have a significantly greater impact on the sector by 2013.

It is a fact, though, that electric vehicle development is still in a very early stage. It appears extremely unlikely that electric car sales would overtake those of traditional cars at any time in the near future. Companies and governments have found it difficult in the current investment climate to find the capital to fund the necessary technologies and infrastructure. In the next three years, electric vehicles are likely to stay on the fringe, becoming gradually more prevalent as subsidies, fuel costs and emissions regulations influence the purchasing decisions of companies and individuals.

However, awareness of the electric vehicle market has considerably increased in this time frame, which points toward the likely development of this opportunity in the years to come. A former senior power and utilities executive commented: "The move to electric vehicles will happen this time. Technology, public opinion and financial issues have all moved significantly since the last time they were being pushed forward."

In emerging markets, particularly India and China, electric vehicles may become major market players relatively quickly, as consumers with little experience of car ownership are less likely to be predisposed to buy petrol-powered cars, and the installed base of petrol-oriented infrastructure is lower. One analyst we interviewed also pointed to the legacy of economic planning in China as a potential enabler of electric vehicles, as central government directives could produce standardization of, for instance, battery technologies.

A recent study by Ernst & Young, Gauging interest for plug-in hybrid and electric vehicles in select markets, reported findings that support the potential for a take-off in the sector. The study reported survey results from 4,000 respondents in the US, Europe, China, and Japan. There was already tangible demand for plug-in hybrids and electric vehicles across all markets surveyed. A notable number of survey respondents were willing to consider the purchase of electric vehicles as soon as they are available. Chinese respondents were most enthusiastic, with 13% saying

they would "definitely" purchase an electric vehicle, and 47% saying they would "most likely" do so. In the medium to long term, the impact on power and utilities companies of the electric vehicle market will be considerable. In years ahead, the relative cost of running electric vehicles could improve, as the price of oil is currently rising while the price of gas has been falling since 2008. An energy analyst we interviewed claimed that,

"Electric vehicles will be one of the most important growth markets for power over the next 20 years. Suppliers who manage to penetrate this market effectively will be those that continue in business."

One particular challenge in exploiting this opportunity is the effect on the local electricity network, both in terms of capacity and infrastructure. As an executive in the sector notes, "On top of increased load levels due to a resurgence of demand in main urban centers, new stresses to the power system will further challenge capacity-constrained networks. For example, cities with large amounts of electric vehicles may quickly see affluent neighborhoods requiring substation and radial distribution line upgrades to support increased peak load requirements."

This market is likely to require a new approach from the power and utilities sector. Power and utilities companies that have entered the market so far have largely done so in traditional ways: owning the infrastructure necessary to produce the electricity, then selling the electricity to consumers.

Some panelists we interviewed felt that power and utilities companies should seek alliances with car producers – noting that consumers are unlikely to go to electric utilities to buy cars – simply because of the marketing gap between the two industries. However, the range of recommendations, from selling energy services, to selling cars directly, is an indication of both the broad potential, and significant uncertainty about successful strategies, inherent in this opportunity.

10. Rising cleantech innovation in emerging markets

At the close of our top opportunity list comes another that the panelists we interviewed feel is very likely to rise up the list in the years to come. Given the growth in energy consumption in emerging markets, these countries are likely to be a critical battleground in the fight against global warming. With the average addition of 500MW of power per week in China, along with many new fossil fuel power plants in other industrializing parts of the world, energy innovation within these markets is crucial to sustainability.

The key thing that makes such innovation possible is the increase in technical skills displayed by graduates from emerging markets; particularly those in China and India. As a power and utilities executive noted, "The main driver here is the remarkable growth in capacity and confidence of Chinese science and engineering. There has been a shift in the locus of scientific research, R&D and innovation."

For the power and utilities companies we surveyed, the most commonly mentioned challenge to taking advantage of opportunities in cleantech was a failure to prioritize emerging technologies. The frequency of mention for this challenge was actually on a par with the number of companies noting they had insufficient capital to invest; this finding echoes issues discussed in relation to risk one (Significant shifts in the cost/accessibility of capital).

Given current trends, there will be an increasing demand worldwide for wind turbines and solar technology over the coming years. The technical expertise to innovate technologically in these areas in the emerging markets will grow, along with the capability to produce the equipment cheaply. As one analyst explains,

Challenges to investing in cleantech, as reported by power and utilities organizations surveyed

Ranked by frequency of mention

Rank*	Challenge
1	Failure to prioritize cleantech
2	Insufficient capital available to invest
3	Not perceived as relevant to organization or sector
4	Public/customers not interested in cleantech

** Based on 60 responses from power and utilities respondents to our global multi-sector survey. Rank order may not reflect statistically significant differences in all cases. Unclassifiable/refused*

"China, and possibly India, will be the lowest cost providers of wind turbines and solar technology in the next decade." Indeed, China already has advantages in terms of cost competitiveness in this area. This makes it imperative for developed-world companies to seek new alliances to benefit from this trend and gain first-mover advantage in this area.

China was already the second-biggest producer of wind energy equipment in 2009, boasting 3 manufacturers in the global top 10 and 5 in the global top 15 of wind turbine manufacturers. Within the next three years, this dominance may well grow, along with other cleantech competencies.

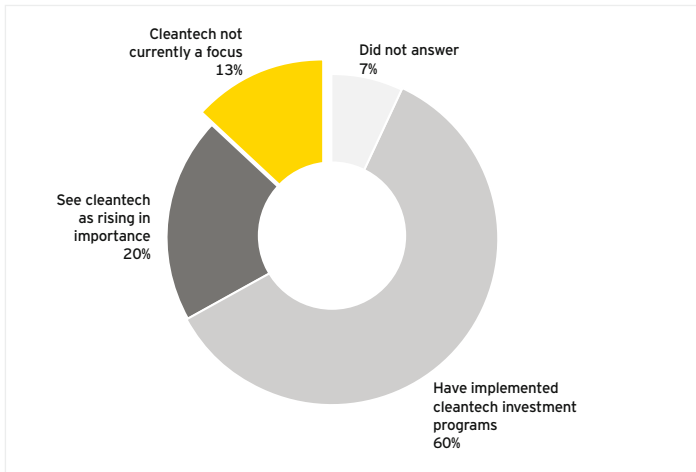
The potential advantages of emerging markets are not limited to manufacturing. Long-term potential is provided by plans for solar panels in the Sahara desert to provide 15% of the EU's power by 2050. According to an executive in the sector, this "will move closer to viability. The trend is by no means certain, but the excellent and substantially predictable solar regime in North Africa, the existence of large land areas of little value in other applications and the relative proximity to Europe create

interesting opportunities.” Of course, this comment was made in the fall of 2010, prior to the unrest in Tunisia and Egypt that has since been echoed in other countries in the region.

In terms of cleantech specifically, the most frequently cited enabling factor is expected growth in the market for eco-friendly products and services. The second most frequently cited factor is the perception that cleantech is key to an organization's innovation strategy. In terms of current success, however, cleantech is even farther from realization. 60% of power and utilities firms said they had already been successful in taking advantage of cleantech opportunities, while 13% said it was currently not a focus. This was despite the fact that power and utilities lead all sectors in the percentage of respondents (more than 60%) saying that cleantech is core to the strategic success of firms in the industry.

There may be a considerable first-mover advantage for those firms that can exploit this opportunity, as emerging economies are likely not only to be customers but suppliers of technology. As one analyst said, “It makes sense to influence their offer and to be among the first takers if it works.” The pace of growth of wind in China points to a future in which emerging markets may well dominate innovation in some key energy technologies.

Sector responses to investing in cleantech



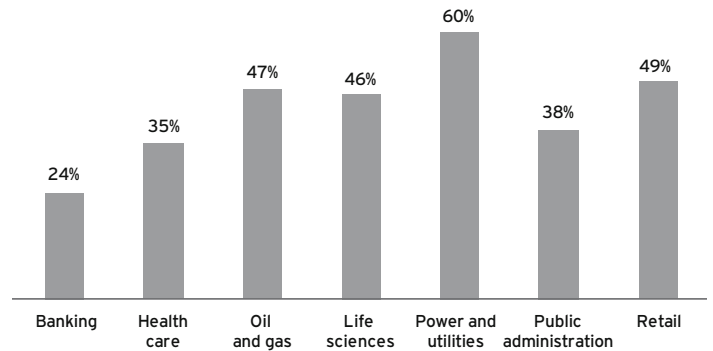
Factors enabling investing in cleantech, as reported by power and utilities organizations surveyed

Ranked by frequency of mention

Rank*	Enabling factor
1	Expected growth in market for eco-friendly products and services
2	Centrality of cleantech to organization's innovation strategy
3	Shift in corporate culture to reflect importance of green issues
4	Growing need to increase energy efficiency and decrease carbon emissions
5	Increasing public pressure to invest in cleantech
6	Increasing sector-specific importance of cleantech
7	Increasing importance of cleantech for CSR

* Based on 60 responses from power and utilities respondents to our global multi-sector survey. Rank order may not reflect statistically significant differences in all cases. Unclassifiable/refused responses not shown.

Percentage reporting that cleantech is core to culture or strategy, by sector



Part 3: water risks and opportunities

The top five risks

1. Water scarcity

Water scarcity is driven in part by predictable demographic trends, as well as less predictable climate trends (see risk three). Demand for water has been growing for the last two years. Unsurprisingly, the panelists we interviewed expect the impact of this risk to rise in years to come.

The risk will encourage a change in the business practices of water companies. Water scarcity will be linked to the idea of environmental performance, and utilities will have to shift to a model where they preserve and manage their water source, making it sustainable in the process. One major water utility in France has made this a key point of strategy, and it is on the top of the agenda for many water providers worldwide.

One key driver of the risk is the uncertain willingness of the public to take responsibility and become more environmentally conscious. This relates not just to drinking water, which provides only a small portion of the total usage of water, but to industrial and agricultural water usage as well.

2. Deregulation and regulatory uncertainty

There have been few changes in water regulation over the past 10 years worldwide, and the outlook for the near future is more of the same. The panelists we interviewed expect this risk to remain at a relatively constant level of impact by 2013.

Still, more and more countries worldwide are likely to privatize and open water suppliers up to competition, although a retreat into nationalism is also a risk elsewhere, as demonstrated following the financial crisis in Argentina. A key issue that may develop within the next three years is political pressure for utilities to reduce tariffs, as more countries face fiscal challenges.

The rising issue of water scarcity will be a particularly difficult one for regulators to manage in a way that does not discourage investment. As one of the panelists we interviewed put it, "There is concern over business models in a 90% fixed cost industry if the expectation is that consumers will significantly reduce their consumption with particular concerns where there is no regulatory protection."

3. Climate change and pollution

The water industry itself is a very minor contributor to climate change, but is well aware of the possible impacts of rising temperatures. The panelists we interviewed expected this issue to rise significantly in importance by 2013. The key challenge for the industry is to reduce overall water consumption, which in turn will consume less energy, reducing overall operating costs for water companies.

One driver of success in this area for the water sector will be for the energy industry to reduce its consumption. The energy sector is, in some countries, the biggest withdrawer of water from the system, so the water/energy nexus needs to work in tandem to manage risks associated with climate change. Working with industry is also crucial to manage the effects of pollution, as expectations of water quality continue to rise (see risk five).

4. Re-municipalization of water service provision

Currently, privatization of the water industry is at a very early stage. In France and the UK, markets have matured to a certain extent. In developing markets, for example in Eastern Europe and China, a significant privatization process has recently occurred, without re-municipalization being an issue. However, in countries such as Germany, there is strong political pressure for the re-municipalization of water service provision. In other emerging markets, privatized water has been re-nationalized.

This can be seen as a relatively extreme case of regulatory risk (see risk two). This particular aspect of regulatory risk is difficult to manage, as re-municipalization will occur almost entirely for political reasons. Educating the public on the implications of water privatization is crucial, in advance of the privatization process. While the private sector is a good source of funds and technical expertise, it will always try to monetize its assets. Of course, in many emerging markets in particular, the replacement of free but unreliable and sometimes unsafe water, with reliable clean water for which one must pay a fee, has sometimes provoked a political backlash.

5. Escalation of water quality standards

This is a risk that has been ever present for the last 10 years, and the panelists we interviewed, on balance, expect its impact to remain roughly constant to 2013.

The level of impact may change by 2015, which is the target date for the European Union Water Framework Directive. It appears, at present, as though many companies are likely to miss their deadline for "good water status," which incorporates both chemical and ecological parameters. In the US, the Clean Water Act has a far narrower remit than the EU version.

It is in the developing world where the potential benefits of rising water quality are greatest, but also where the challenges lie. According to an academic commentator we interviewed, "There is a risk that it will not happen due to weak policy-making, poor regulation and even weaker water utilities despite the fact that it is in this area where greatest health benefits would arise."

The top five opportunities

1. Increasing emerging markets demand for water infrastructure

As economies grow, they require more and more infrastructure to support their development. The panelists we interviewed, on balance, see this opportunity as likely to increase significantly by 2013, as a middle class rises in the emerging markets.

The level of infrastructure within a country, particularly a developing country, often lags behind its level of development. This issue is particularly acute in water. In many emerging markets, the emphasis in regard to water is on renewal and maintenance of current infrastructure, rather than focusing on investment (in contrast to, say, power, where new capacity is being added at a tremendous rate). This phenomenon occurs, in part, because of political pressures. Priorities are often focused around relieving pressure on water supplies with leaking and aging infrastructure.

However, within the next 10 years, as levels of wealth rise more quickly than populations, the focus is likely to shift from renovation of existing infrastructure to construction of new infrastructure. This new infrastructure will support rising public expectations for water quality. In addition, water pollution and water treatment will be big issues in the next 10 years, and water infrastructure will have to be constructed to meet this need accordingly.

2. Water desalination

Water desalination is considered a prime opportunity within the water industry as an alternative method of water supply. The panelists we interviewed expect this opportunity to grow by 2013.

There may well be spikes in demand for desalination technologies, as much export-oriented development in emerging markets occurs on the coasts. As one panelist said, "This is a short cut to adequate water resources for rapidly growing cities and megacities."

In addition, there are opportunities to combine the technology with energy generation. Rural desalination, for example, would scale down normal desalination facilities, and power them with renewable energy. Both from an infrastructure and energy saving perspective, this is an attractive proposition.

The challenge will be to take advantage of an opportunity that will be often idiosyncratic and distributed over a wide geographic region. Rapid growth is expected within this market segment, but it will be driven by developments in a large number of small, and often localized, markets worldwide.

3. Wastewater treatment

Unlike the previous two opportunities, the panelists we interviewed expected this opportunity to remain roughly constant in scale. This expectation can be attributed to the

challenges posed by regulation as the opportunity is dependent on the development of sound regulatory frameworks. A marked contrast can be seen in the regulatory environments of the US and EU. In the US, regulation is not very advanced but within the EU, the market segment is regulated very well, and there are opportunities for profitable growth in this area.

As the requisite technology and infrastructure is developed, particularly in the emerging markets, further opportunities will be created. However, some panelists we interviewed expressed skepticism as to the extent that regulation will enable the development of this segment as a viable long-term market for international private providers.

4. Water transfers and international water trade

Water is only sometimes recognized as a tradable good, and water resource management has changed recently from being supply enhancement-based to demand management-based. Furthermore, it is ultimately more efficient to recycle wastewater, than to transfer potable water over long distances, even through the use of pipelines (which require significant capital investment).

Nonetheless, the panelists we interviewed expect opportunities in this area to grow by 2013. This expectation may be linked to rising concerns about water scarcity. As a result of such concerns, proposals of international water transfers are now being considered. Despite the very high economic cost of moving water in this way, this has already been undertaken in pilot schemes; for example, the water transfer program between Lesotho and South Africa.

5. Water as a "human right"

Many developing countries have vast needs for improved water sources but little funding for such enterprises. Utilities companies tend to sell water-related services in these countries; for example, finding solutions to practical problems, identifying risks and contractualizing the management of the local water source. As the financial returns to providing such services are so small, the primary benefit for utilities is in service of sustainability and CSR objectives.

Water is, however, increasingly being seen as a human right. This may tend to raise international development funding for water, especially as water scarcity rises on the global agenda. It may also reduce the trend by which development of water infrastructure tends to lag behind a country's level of economic development. As one academic commentator noted, "The importance of this trend stems from the fact that a human right obliges governments [thus] raising the topic a couple of steps in the political agenda." That said, the relatively low level of funds likely to be available in service of this cause leads the panelists we interviewed to expect the size of this opportunity to remain roughly constant in the years ahead.

Methodology

A man in a white shirt is shown in profile, talking on a mobile phone and holding a clipboard. He is standing in front of a wind turbine. The background is a bright sunset or sunrise over a body of water, with the sun low on the horizon, creating a lens flare effect. The wind turbine's blades are visible on the right side of the frame.

Identifying strategic challenges

We interviewed a panel of 14 commentators in the power and utilities sector, asking each interviewee to identify the top risks and opportunities for their sector in 2011, as well as risks and opportunities “below the radar” that could rise into the top 10 in years ahead.

The panelists included strategy planning and risk management executives, heads of public affairs, academic advisors and an Ernst & Young strategic analyst. These individuals were selected for their demonstrated insight and leadership within the sector, rather than as a representative sample.

We asked the panelists to focus on risks and opportunities for the “leading global organizations” in the power and utilities sector. We also asked them to provide commentary on how they saw the risks and opportunities evolving over the next three years, and for their views on how firms should respond.

The panelists’ risks and opportunities were grouped and aggregated to form a strategic challenge list for the power and utilities sector. This was also done for six other industry sectors; the risks and opportunities that were common to the largest number of sectors were then promoted to a global list.

Ranking the challenges and understanding how organizations are managing these challenges

The second phase of our research was to conduct a large-sample survey of companies and governments in 15 countries in order to rank the strategic challenges and obtain forecasts on whether these challenges would be more or less important in 2013, and discover how leading organizations in each of the seven sectors are responding to these challenges.

In 15 countries, a total of 110 interviews were conducted for the power and utilities sector. This resulted in approximately 5-10 interviews per country, with the exception of France and the MENA countries, for which there were only two interviews due to the difficult political situation.

Unlike the commentators we interviewed, respondents to our large-sample survey were asked to focus on challenges for their own organization, not the sector as a whole. Only organizations ranking risks and opportunities among the top four were subsequently asked about measures to address these challenges.

Linking the sector reports to the global report

The top 10 risks and opportunities for global organizations, as ranked by our survey respondents, are listed in the appendix to this report. For the purposes of the sector reports, where there was a clear link between the sector and global risks and opportunities, we have included the relevant charts from the main report. In some cases, the risk or opportunity was too specific to a particular sector and in those instances we have not been able to link back to the global lists and so no charts have been included.

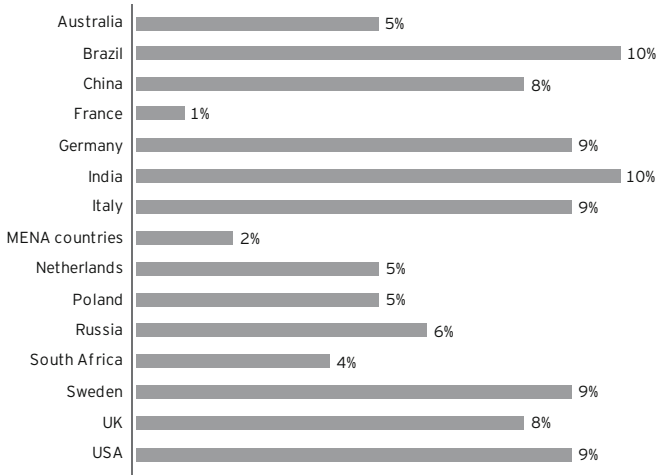
Notes

Individual open-ended responses were in most cases coded as a single answer. However, in some cases, an individual's response was ambiguous or lengthy, and therefore coded as multiple answers. To present the data as clearly as possible, figures in excess of 100%, which have been produced as a result of this coding process, have been adjusted to sum to 100%. The conclusions drawn about the relative frequency of responses within sectors are not affected by this adjustment. To avoid error, when comparisons are made between sectors, the unadjusted figures are used.

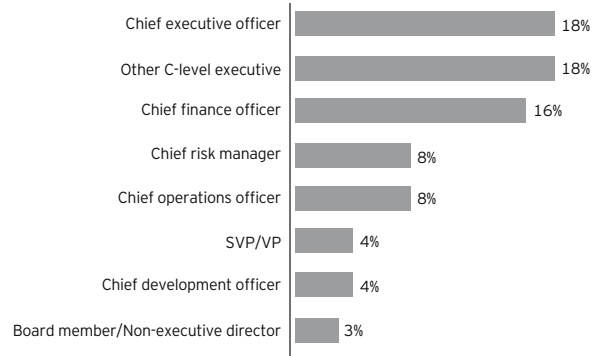
Our global report addresses high-level macro risks and opportunities. Our sector reports address sector-specific risks and opportunities. For this reason, the relative ranking of risks and opportunities is sometimes different.

Risk and opportunity rankings in our global report reflect the results of a large-sample survey regarding current issues. Risk and opportunity rankings in our sector reports are based on forward-looking analysis by panels of sector professionals. For this reason also, the relative ranking of risks and opportunities is sometimes different.

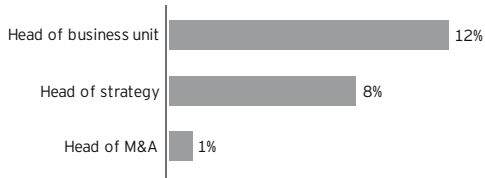
Geographic location



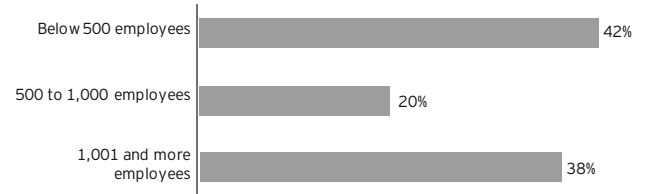
Leadership management level



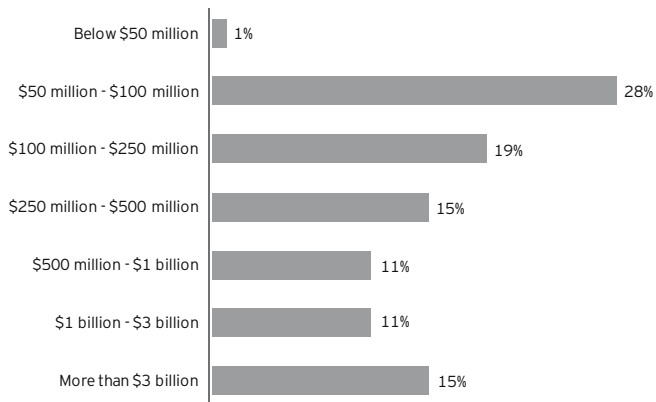
Operational level



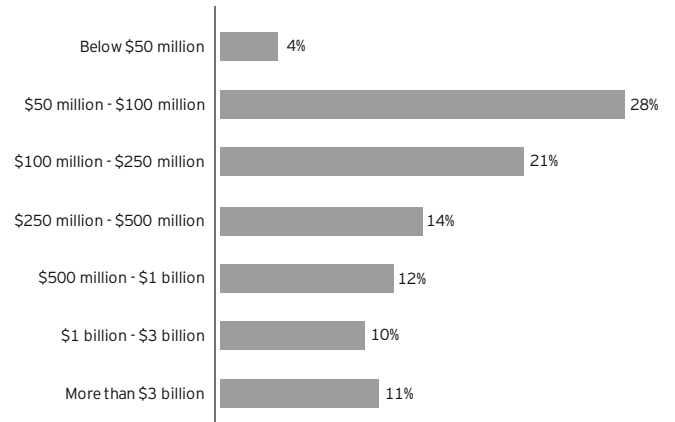
Size of workforce



Worldwide annual revenue (in US\$)



Domestic annual revenue (in US\$)





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