

ENERGY RISK MANAGEMENT FOR UK BUSINESS

White Paper



Enterprise



Grantham Research Institute on
Climate Change and
the Environment





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1 INTRODUCTION

Recent research of businesses from npower revealed that energy now presents a higher level of risk to organisations than health and safety, so it clearly needs to be managed effectively to negate those risks.¹

This paper has been developed to provide the context for energy risks, shows how they may change in the future and ultimately, how businesses can manage risks.

Two significant changes to the UK supply of energy will gather pace over the next ten years. These changes will draw in a high level of investment and result in a new relationship between supplier and customer.

Customers will start to see differences. For some customers, new revenue opportunities will spring up. For others, new means of cost control will emerge and new brand reputation risks will unfold.

The first source of change has its origin in a huge effort to cut back carbon dioxide emissions. This is a government-led revolution, pushing through new ways to produce and distribute electricity, and it affects the way energy is priced and marketed.

The second source of change is entirely different. It is driven by the market, by changes in global supply and demand, and by innovation. The acquisition of new technologies and the rise and fall of fossil fuel markets will be critically important to the progress of the next ten years.

The next few pages will unroll the story of the next decade and reflect, from the viewpoint of businesses, upon how it may feel and how people may act. The story begins with energy markets. It leads onto energy policy, before turning to an exploration of ways to manage risk. In the course of charting the next ten years, it draws up scenarios from the soothsayers of today and interprets them for tomorrow's organisations.

¹ npower Business Energy Index 2010, published April 2010

2 MARKETS AND POLICY

2.1 Lessons from the last thirty years

Twenty of the last thirty years, those between 1980 and 2000, were a quiescent period for businesses in the UK.

A gentle down-swing in international hydrocarbon markets, the boon of new oil- and gas-field technology deployed in the North Sea, the liberalisation of the power sector and inefficiency-busting industry restructuring, all contributed to low prices. Organisations enjoyed a comfortable, if not dull, ride.

Prices of electricity and gas were falling steadily, not just in real terms but in nominal terms too. Oil prices

remained below US\$20 per barrel (Brent light crude) for most of the period and coal prices barely touched \$40 a metric tonne (Australian steam coal). Fossil fuel prices were depressed by the swathe of investment that followed the peak prices of the 1970s, and the UK continental shelf produced plentiful gas and oil, with gas production nearly tripling through the period and oil production nearly doubling, according to figures compiled by the UK government. Finally, privatisation of the power sector brought a new, more competitive market, and costs were slashed right through the supply chain. The price trends are shown in figure 1.

As the 1990s ended, the energy world changed greatly. The Kyoto Protocol was adopted in 1997. The world economy rode an escalator of seven

years of growth, and it pumped a record general stock and asset price bubble (deflated, but only temporarily, when the dotcom bubble burst). Energy prices joined the escalator and the 2000s saw spiralling oil and gas prices, hitting record peaks in nominal terms, triggering disputes between Europe and Russia, and stoking concerns about security of supply. Businesses learned to take energy price risk seriously.

During the 2000s, governments in Europe began to take action on greenhouse gas emissions, at first writing policies and then legislation. The UK introduced its Climate Change Levy and its Renewables Obligation in 2001. The Kyoto Protocol came into force in 2005, and in the same year, the EU Emissions Trading Scheme began, becoming the most ambitious environmental trading scheme ever in terms of number of participants and total value traded. The trading scheme requires operators of large combustion plants throughout Europe to account for their carbon dioxide emissions and to surrender allowances for every tonne of emissions released. They may trade allowances among themselves so that those who can reduce their emissions most cheaply do so first.

Throughout the decade, renewable energy, energy efficiency and transport policies were ramped up. These were needed, so the government's argument ran, not only to protect the

UK prices for delivered energy (nominal prices)

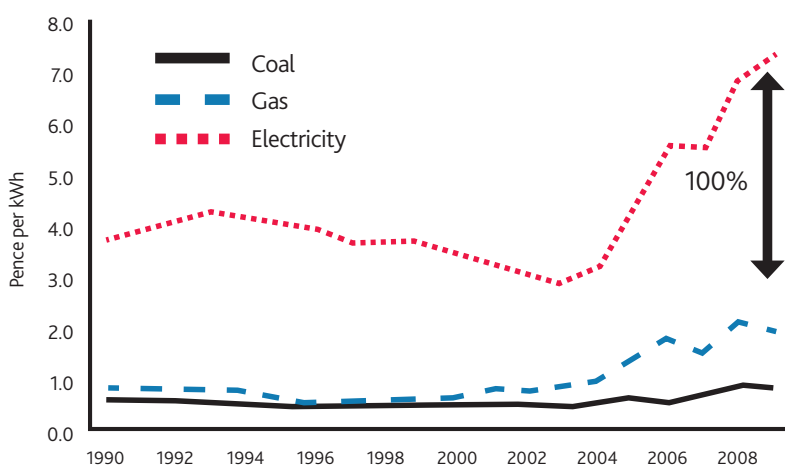


Figure 1 Prices paid by UK manufacturing fell for ten years before increasing by 100% over four years from 2004 – 2008.

Source: Department for Energy and Climate Change



environment, but also to shore up energy security. Finally, the Climate Change Act was enacted in 2008, so that from now onwards, the UK will budget for its greenhouse gas emissions and will receive independent advice on what those budget targets should be.

The recession that followed from 2008 until 2010, and the debut of natural gas from shale formations, brought a more relaxed outlook for energy security. The debutant shale gas started to take a significant role. As a result, over the last two years, gas prices in the US have returned to levels not seen since 2002 and US imports of natural gas have eased, releasing gas for consumption elsewhere in the world. US Energy Information Administration (EIA) data shows that shale gas played an important role in these changes, and the US is expected to become self-sufficient in natural gas. As a result, some natural gas shipping capacity is being rerouted to other regions, notably Asia, and perhaps will come to Europe in the future.

Although this new gas story has only just begun, with little yet known about possible large fields in Saudi Arabia, Poland and other locations, it has already transformed the energy security debate, addressing some of the urgency with which renewable energy and coal policies were discussed in Europe back in 2007. It promises to have an impact on oil prices too.

For power markets, the increase in gas availability is timely. Many coal

stations are running on constrained hours under the Large Combustion Plant Directive and will close by the end of 2015. They will have to be replaced by new generation capacity. Power market prices will have to remain full enough to pay for that new investment. This will result in a significant increase in prices for consumers. Whilst manufacturing and service industries were feeling the chill of falling consumer demand during the recession at home, and facing stiffer competition from large, low-cost competitors abroad, there were developing countries sucking in commodities to satisfy their voracious consumption. China, Brazil and India, in the vanguard, pulled demand ever ahead of supply, and commodity prices stayed resolutely high. Perhaps, some commentators suggested, supply of oil would lag behind demand through much of the decade ahead. This seems to be reflected in stubbornly high long-dated oil prices.

However, just as shales took the heat out of gas prices, so shales might presage weakening oil prices. Oil and gas prices used to be tightly coupled. That is because co-production used to be more important than it is now, and gas storage was limited. Now gas prices are far more independent, but some link remains. So what will become of oil prices?

The oil price has fallen back from its boom-time peak, and slides further against a basket of currencies, as the US dollar weakens. And US production of oil is increasing, which foreshadows a really big story: huge and potentially economically recoverable new reserves

of oil. According to the US Energy Information Administration, three US states alone contain about 800 billion barrels of recoverable oil in deposits with expected yields of more than 20 to 25 gallons of oil equivalent per short ton. In comparison, at the end of 2007, US crude oil reserves were estimated at 21 billion barrels, according to the US EIA. In other words, in three years, the US' potentially recoverable reserves may have increased forty-fold.

Meanwhile offshore production is in decline in the US. The Deepwater Horizon disaster in the Gulf of Mexico in spring 2010 may heap liabilities onto offshore producers in the US and elsewhere, dampening production further.

Overall, the future price of oil is rather uncertain.

2.2 The carbon challenge

Besides a sharp rise in energy prices, the last decade also saw renewed regulatory interest in the energy market. Throughout the 1990s, the keyword was 'liberalisation' and the ambition was to keep the state out of the market as far as possible. This started to change around 2005. As the scale of the issue sank in, the state began once again to assert its influence over the energy sector, aiming to introduce structural changes in energy production as climate change requires.

In the UK these efforts were formalised in the Climate Change Act of 2008.

The Act is the culmination of a process that started in 2005, when Britain hosted the Gleneagles G8 summit of industrial nations and put climate change on the international agenda. The Climate Change Act commits the UK to reduce its greenhouse gas emissions by at least 80 per cent by 2050, starting with a 34 per cent reduction by 2022. These targets were recommended by a new advisory body, the Committee on Climate Change.

Subsequent policy documents have outlined how the cuts are to be achieved. At the core of the strategy, which is shared in broad terms by both the outgoing government and the new Coalition, is the decarbonisation of the electricity sector. Electricity production has to become virtually carbon free by the 2030s.

To achieve this, unprecedented investment will be required in clean energy sources like renewables, in particular on and off-shore wind, and nuclear, but also, if it can be economically proven, carbon capture and storage for coal and gas.

A host of regulatory measures were put in place to promote the decarbonisation of the power sector and now the design of the UK energy market itself is under review. The net effect of these changes has been to put further pressure on energy prices, and to change the once comfortable role of energy professionals and energy suppliers alike.

At the same time, the government is providing stronger incentives and more

assistance than ever to organisations wishing to reduce their energy bill. Increased energy efficiency is the flip-side of the decarbonisation coin, and a host of programmes are in place to encourage it. The most recent addition is the Carbon Reduction Commitment Energy Efficiency Scheme (CRC) which launched in Spring 2010 aimed at large public sector organisations and non-energy intensive commercial enterprises (energy intensive industries are covered by the EU ETS).

Obviously the CRC has only recently launched, so it is too early to assess its impact. However, none of these measures have had as much impact on UK greenhouse gas emissions as the economic recession triggered by the financial sector crisis of 2008. Needless to say, the recession has made a number of deep impacts on energy management.

2.3 The recession experience

As a result of the financial crisis, the economies of most developed countries slipped into the most severe recession for decades, from which they are only slowly emerging. In the UK and elsewhere, recession has cut revenue growth in most sectors, and for energy-intensive industries, there has been no relief from lower energy costs.

One of the impacts of the recession has been to worsen credit risk. Companies with a high risk of default on their contractual obligations may

be offered less flexible payment terms or may be unable to secure credit insurance. This can make it difficult for a company to negotiate supply contracts or to switch supplier. Even so, as long as a company is open about its financial status, it is more likely to be offered supply, even without insurance.

It is remarkable that the recession has not been accompanied by significant reductions in energy prices, but the supply of hydrocarbons has remained tight and continuing growth demand from China, in particular, has compensated for slumping demand in the Western world.

One noticeable exception is the price of EU Allowances, the currency of the EU Emissions Trading Scheme. Allowance prices have softened further than many had predicted, after emissions from European heavy industry shrank fast, creating a surplus of allowances in the short term. And there are no developing countries to offset slack European demand in this market.

There has been much debate around an underpin of the carbon price, to ensure it does not fall below a certain level, but a conclusive decision has yet to be made.

Thus firms are squeezed between falling revenues and sustained energy prices, so tax revenues have tumbled in line with profits. Energy intensive firms have been most exposed, and they understand more than most how hard it is to compete against rivals whose profit margins are less affected.

Thus, many businesses have sprung into action to prop up their margins, cutting operating costs and deferring investment. It may have led to a greater focus on operational energy use and tighter risk management. It may also have cut energy efficiency investment.

2.4 The decade ahead

Signs across the economy now point to recessionary recovery. Revenues will recover, investment will bounce back, and perhaps the culture of tight cost control will gradually work loose. Or in the latter case, perhaps not, for the pressure on energy costs look set to remain. Government policy will play a large part in this.

To gain some insight into the next decade, Ofgem's recent work on the energy sector is a good place to start. Ofgem considered many factors in its Project Discovery, an investigation into whether or not future security of supply can be delivered by the existing market arrangements over the coming decade. Unsurprisingly, economic growth is found to be one of the most important determinants of future energy prices, but the costs of asset replacement and, particularly, the UK's decarbonisation strategy loom large too. When all these factors are combined, it appears that the upward march of energy prices in the 2000s will not tire in the 2010s. Nominal electricity prices doubled between 2000 and 2010, which is a little over 50 per cent in real terms. Ofgem envisages at least a real 50 per cent increase by 2020 (Figure 2).

In some of Ofgem's scenarios, there is also an uncomfortably bumpy ride when electricity prices temporarily spike in 2016 and 2017, in response to the forced retirement of some coal and oil-fired power stations in 2015 under the LCPD. There are, therefore, storms on the horizon.

These policy-driven costs could be an enduring presence. Unlike the three decades past, the next three decades will be ones in which dramatic changes will be funded through increasing prices as both wholesale costs and distribution charges will most likely increase. It is government policy to drive a wide and deep transformation of the energy system, and electricity is chosen to be first. This metamorphosis from dirty to clean power, smart networks, and trials of new technologies such as carbon capture, will cost money, and lots of it, as the technologies are expensive.

All in all, perhaps £100 to 200 billion will be invested over the next decade, a truly huge sum for this sector.

That rate of investment, £10 to 25 billion a year, is far larger than the sector has been used to delivering. Over the last 15 years, annual capital expenditure has ranged between £2 and 8 billion, illustrated in Figure 3.

In response, a review of the electricity market arrangements is under way. The way in which wholesale power and generation capacity is contracted and traded is to be examined. It could lead to fundamental changes in the structure of the UK power market, but until these decisions are taken, power generators and suppliers will be unsure exactly how investments in power generation will be remunerated in the future. This uncertainty may encourage them to wait awhile before committing to new investments.

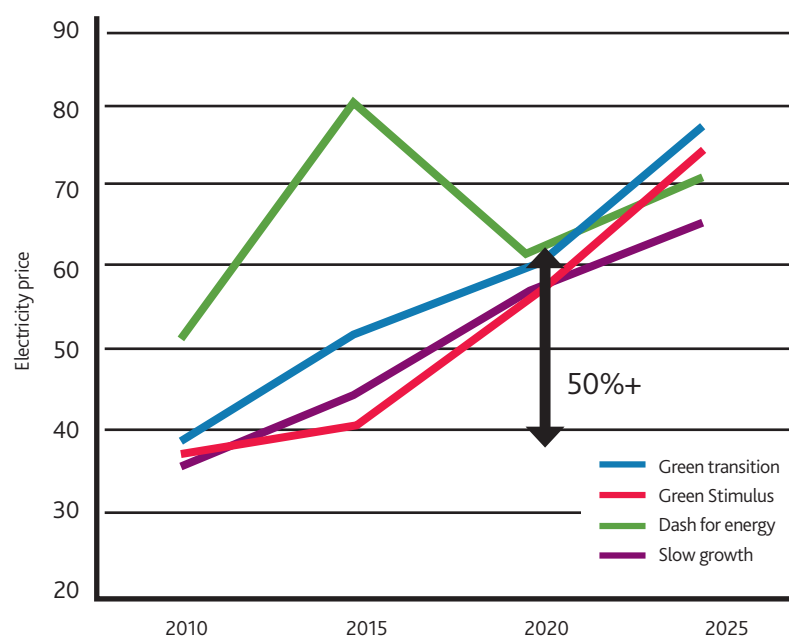


Figure 2 Economic growth and carbon policy are both expected to contribute to price increases in the decade ahead

Source: Ofgem

2.5 Uncertainty

The changes predicted for the decade ahead are not set in stone. Important parts of the policy have not been written into statute yet. These include decisions on:

- reform of the electricity market mechanism;
- a tighter emissions cap in 2020 for the EU Emissions Trading Scheme;
- consents for new fossil, nuclear and renewable power stations to replace current stations at the end of their lives or in compliance with the Large Combustion Plant Directive;
- arrangements for the interconnection of UK and continental European energy infrastructures;
- consents and funding for new network infrastructure to accommodate wind power, changing demand and new services;
- carbon performance standards for new gas- and coal-fired power stations which have been discussed but are not yet on the policy agenda;
- changes to renewable energy targets, delivered through an extended Renewables Obligation, a renewable heat incentive and feed in tariffs;
- the reform of the Climate Change Levy, as part of wider plans to underpin the carbon price.

Businesses may also find policy changes which affect their use of buildings, such as regulations governing the carbon emissions from energy use in new and refurbished buildings.

Until the decisions are taken in these policy areas, no one will know what costs have to be borne. It will be an unpredictable future.

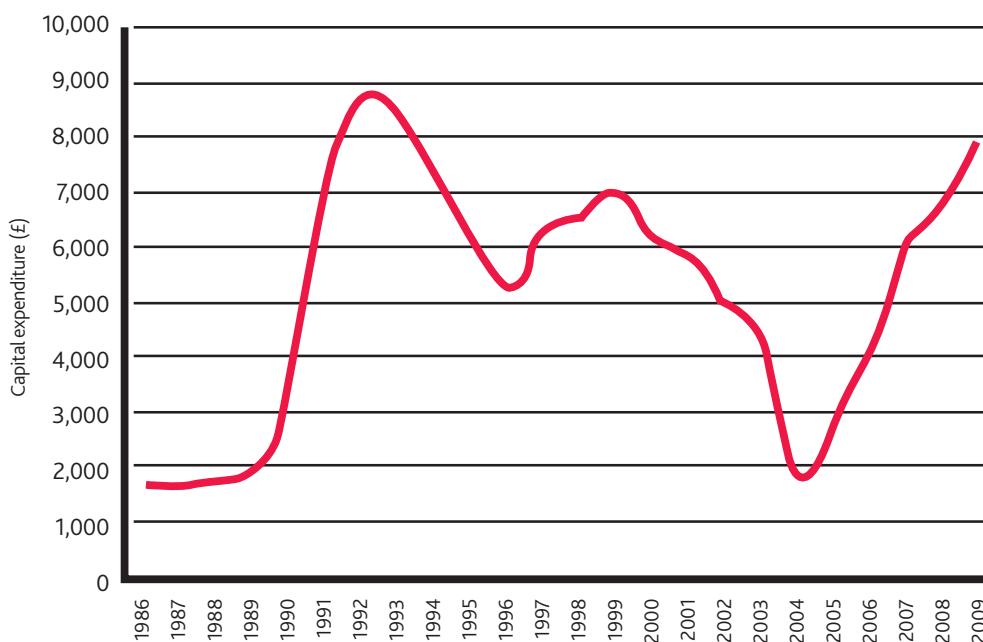


Figure 3 Capital expenditure in the UK electricity and gas sectors has risen to levels not seen since the early 1990s, but it remains below levels forecast for the next decade (2009 money)

Source: National Statistics and Vivid Economics calculations

3 THE IMPACT OF ENERGY RISK ON BUSINESS

How will these changes affect businesses for whom energy is one of several important purchases?

This section discusses the principal ways in which businesses could respond to higher and more uncertain energy prices, rising value of carbon, new energy management services and the publication of performance benchmarks. The key energy risks are summarised in Box 1, and Box 2 contains some energy management tips.

3.1 Higher value produces fertile ground

As time passes, customers become more demanding. Their own systems become more mature, more efficient, more sophisticated. They similarly expect more from their supplier: more data and better, wider service offerings.

The needs of customers change too. They grow or shrink, change focus, test ideas. They expect access to products that suit them, as well as choices and innovation.

What will change in the next decade is the increasing economic pressures of rising, volatile prices and carbon liabilities, and the costs of

technology that could make new tricks in energy management possible. The clue to where the latter may happen is the motivation for buying in services. A customer buys from a supplier where that supplier has the economies of scale to offer technical capability and services that individual customers could never possess themselves.

Suppliers are already introducing new services and partnership arrangements that allow customers to access their expertise in energy and carbon trading. As the value at stake and subscriptions rise over time, one can expect to see greater economies of scale in the provision of these new services, and improved risk management by customers. Customers can expect to contain their cost increases and energy price, carbon price and quantity variation, with the help of their suppliers.

The rationale for providing new services strengthens as carbon regulation tightens, carbon prices

rise, energy prices creep upwards and as price risk increases. As the complexity increases, economies of scale appear, and as technologies improve, service costs fall. These are fertile conditions for the genesis of new services such as risk and legislative assistance and technology. Although they might be offered only to the largest customers at first, as conditions allow, the services could become viable for medium-sized and sometimes small customers too.

3.2 Energy and carbon become one

Much of the policy, like the EU Emissions Trading Scheme, introduces a pollution cost into the price of energy. It would be most logical to integrate carbon and energy supply services, both in terms of monitoring and recording, compliance and liabilities management.

Box 1: Five top risks for energy management

1. Continued upward trend in energy prices
2. Increased volatility in energy prices
3. New price risks from carbon regulation
4. Reputation risks from carbon regulation
5. Increasing regulatory and technological complexity

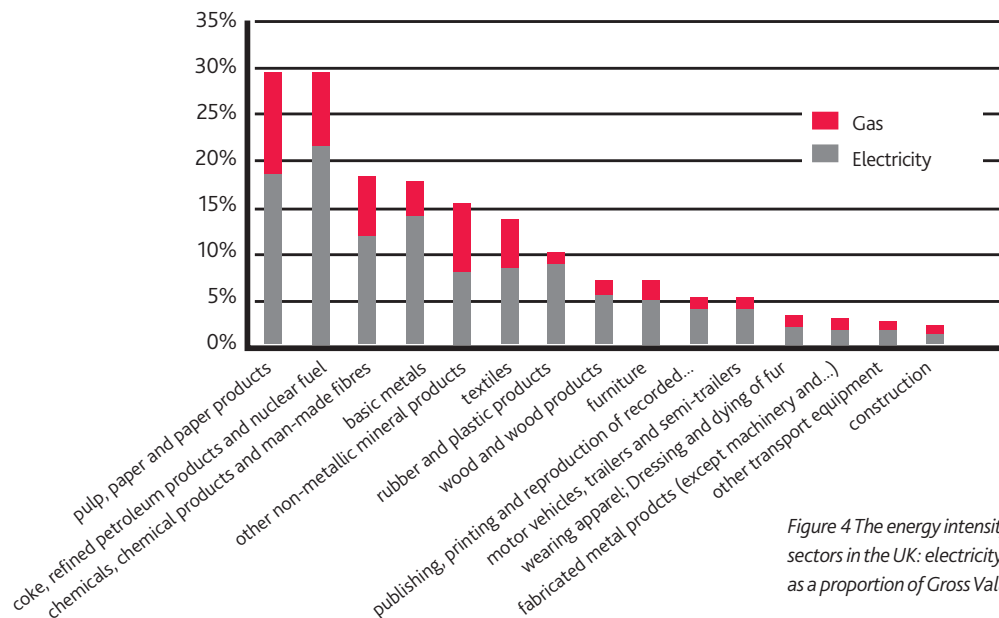


Figure 4 The energy intensity of industrial sectors in the UK: electricity and gas purchases as a proportion of Gross Value Added

A first step along this road would be to introduce parallel carbon and energy services, offering similar recording, reporting and billing. Further down the road, a similar range of purchasing and contracting arrangements might be offered, with the sale and purchase of credits or allowances proceeding through trading services divisions, comparable with energy trading. It would be a small step from there to a supply package that provides full service compliance with the EU Emissions Trading Scheme, the CRC Energy Efficiency Scheme or any other regulation. For example, a supplier might link up with a verification agency to collect data, make trades of emissions allowances or efficiency credits to ensure compliance, and submit all returns to the relevant authorities. This could all be built into the main energy supply contract and service agreement. Further value added

might be offered through benchmarking and comparisons with peers, and over time, on an energy-only, carbon-only, or combined basis.

The carbon-energy package might be made available in standard forms for medium-sized customers, perhaps with some element of demand-side management described below. It is likely to be of most interest to energy-intensive sectors, such as cement and petrochemicals manufacturers, identified in Figure 4. Larger customers can possibly expect something more tailored, with a range of levels of risk sharing, carbon management services and depth of demand-side incentives.

These services are already available in some form, but may develop much further in the decade ahead. The kinds of services already on offer include:

- value at risk reporting management tools;

- assistance with purchasing strategies;
- in-depth market reports;
- facilitation of energy trading.

3.3 Smart grids

Part of the revolution of the next decade is the awakening of the grid. The grid will grow smarter. The intent is that control will no longer be restricted to the planned operation of the very largest connected suppliers and off-take, but becomes possible dynamically and reactively, and extends to smaller and smaller scale units. This quite remarkable transformation is made possible by low-cost telecommunications, computer and control equipment. It is not a question of whether the technology is possible, but rather how quickly it will be adopted and what will be economically advantageous.

3.4 Attention to energy purchasing

None of the above suggests there will be less management attention on energy purchasing; in fact, it may well receive more attention. After all, expenditure on energy has been rising over the last decade, even while consumption has been steady or falling, see Figure 5.

Organisations can consider a number of ways to control these rising costs, for example:

- bring energy use and carbon emissions to the attention of senior management and examine the need for an energy director;
- develop an energy plan and select an energy procurement strategy which suits the appetite for risk and perhaps brings together management of consumption and procurement;
- improve monitoring of energy use and introduce processes to report changes in use;
- increase awareness of energy costs in plant and fittings purchasing and in their operation;
- use more sophisticated tools and records for energy use forecasting, and compile more detailed budgets;
- consider switching supplier to take advantage of the best services;
- identify and estimate the cost of operational and asset changes,

Box 2: Five ways to improve energy management

1. Assign clear responsibility and targets for energy management, energy consumption and energy efficiency
2. Make energy and carbon an issue for senior management through regular reporting
3. Take advantage of energy management services and products offered by the market
4. Conduct an energy audit to gain a head-start on energy efficiency
5. Explore the possibility of, and any available government incentives for, renewable energy production on-site.

so as to improve energy efficiency and accurately forecast pay back period;

- ensure they have the internal resource to manage the risks and if not, perhaps outsource:
- change energy benchmarks used in contracts to contain price variation clauses linked to energy and carbon prices.

3.5 Working practices and contracts might change

For most energy intensive sectors, energy is a strategic issue, and changes to working practices and contracts might be considered. Not only may firms need to consider their own position, they may also anticipate the behaviour of competitors and the competitive advantage conferred by lower energy intensity.

In response to greater price volatility, these businesses could review their energy purchasing contracts and the exposure to variations in prices, both the contract length and indexation. They might also increase the controllability and responsiveness of energy consumption, introducing flexible de-rating of plant, interruption of processes at times of peak energy demand, and changes to shift patterns and work delivery commitments when running below full capacity. They might also begin, if they do not already, to change the scheduling of planned maintenance work such that they take place at times of high energy prices.

They may also choose to take advantage of the opportunities available through onsite generational assets and the smart grid.

By increasing generation when the National Grid requires it or reducing when demand is high, they can benefit financially through the short-term operating reserve market.

These large customers will all find themselves under the regulation of the Carbon Reduction Commitment and other legislation. It will be incumbent upon them to pay close attention to their administrative and financial liabilities. There will also be opportunities to take up incentives for renewable power generation and heating, and there will be the purchase of lower or zero carbon energy supplies for them to consider.

3.6 Reputations are at risk

The CRC Energy Efficiency Scheme, in place since spring 2010, introduces a new reputational risk, which many organisations will have to take seriously. The risk is that the league tables which government will construct, showing relative carbon performance between peers, will tarnish the reputations of the laggards with their customers.

Businesses can respond by strengthening their own internal governance arrangements, improving the forecasting of their compliance position, and using benchmarking to understand why they attain a level of performance relative to their peers in the league table. They might also decarbonise their electricity

purchasing, as a sign of commitment, even if this is not recognised in the CRC scheme.

The sorts of practices that the CRC might encourage include:

- finding opportunities to drive better efficiency;
- linking investment to a lower energy target;
- introducing company-wide carbon tracking and monitoring;
- engaging professional support or outsourcing operations to experts;
- making alternative decisions relating to property selection;
- understanding league table positions relative to competitors.

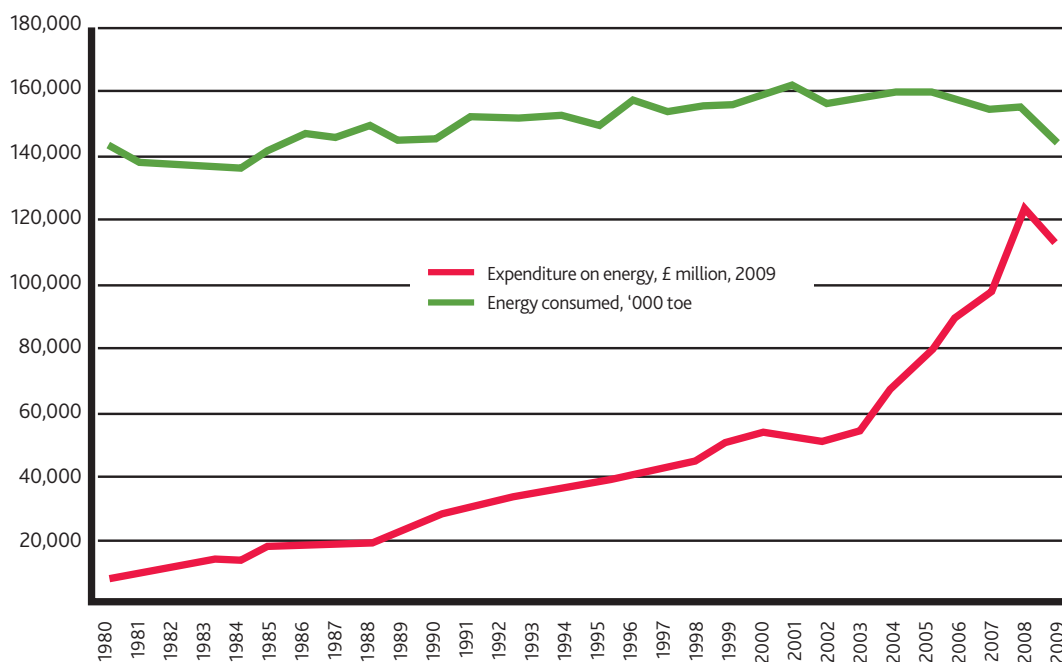


Figure 5 Spend on energy and carbon has risen over the last decade, despite a slight fall in consumption

Source: DECC

4 CONCLUSIONS

The risks associated with business energy use are increasing. Energy prices are becoming more volatile and increasing regulation is placing further administrative burden and reputational risk on businesses. As a result it is more essential than ever that businesses take action to manage energy risk.

To ensure they are best-placed to manage energy risk, businesses need to make energy a top-level priority and work to develop an integrated strategy that brings together the management of energy consumption and energy procurement. This will be a step-change for many but it is crucial that the different people and departments that are responsible for energy work in a collaborative manner, and take advantage of the products and services from suppliers that are available to help them do this.

Sector views

Although all sectors face similar uncertainties, some are more exposed to energy risk because they are intensive energy users and/or are more susceptible to the reputational risks of energy use. Here are some observations for the retail, industry, utilities and the public sectors, which all have different priorities and courses of action available to them when managing energy risk.

Retail

The retail sector typically has many sites that are geographically dispersed, but improvements in metering technology have enabled much more sophisticated management of energy purchasing and consumption. Already, it is becoming possible to manage sites together, as a portfolio.

The retail sector consumes a lot of energy in refrigeration, heating and air conditioning, where most of this equipment runs under the simple control of thermostats. Over the next decade, this might change. Sophisticated active management of equipment is rare now, but may become common.

Already, at larger sites and distribution centres, on-site generation can be traded in the short-term operating reserve market. This brings in revenue both for being in a state of readiness to generate and for actual generation. It can also cut supply costs by trimming peak demand at the site. In the future, demand from refrigeration, heating and air conditioning equipment may be traded in the same way. The type of generation is becoming more diverse, with renewable power and heat being added to gas and oil fired generators and boilers. Many retailers now invest in their own green generation, encouraged by the power purchase agreements available to them.

Of more immediate commercial concern for many retailers is the reputational risk associated with the Carbon Reduction Commitment. The worry is that the media will make unfavourable comparisons between retailers based on the CRC league table. This concern is particularly acute in the short-term, as this complex new scheme settles down, and problems are ironed out.

Industry

The importance of energy purchasing varies greatly across industry. The most energy intensive can use forms of contract to manage price risk in the prompt (short-term) and far market. Many also have onsite generation, which can be traded on the grid and used within the site to reduce exposure to the market at times of high energy prices. It can also be used judiciously to discount network charges as described earlier. Some industrial organisations may also be looking to align with international energy purchasing strategies, but at the moment this is not an area suppliers can assist with.

As the decade progresses, greater incentives to flex load, as well as new indexed and financial hedge products from energy suppliers are likely to emerge. If massive renewable / nuclear energy capacity really does come on-line as planned, and electricity prices become more volatile as a result, then the pay offs from these forms of purchasing could become much more attractive.

Utilities

Water companies, which are heavy users of power, like to match their five-year regulated prices with similar terms of energy contract. One of their aims is to anticipate future price changes when, in a couple of years' time, they start to negotiate future water prices.

Water companies also hold a lot of power generation assets themselves. In part this is because they have critical assets for which they carry back up generation, and in part it is because they produce biogas or incinerate waste products and release energy. They have the opportunity to manage all these generation assets and some fixed and variable elements of power and heat demand, in what

becomes a complex energy and carbon management operation. Some water companies may be large enough to tackle this task themselves, but others may prefer to outsource it to their suppliers.

Like water companies, telecoms firms may discover opportunities for load management and provision of short-term operating reserve, because both have on site generation. The water industry also has further flexibility in its demand profile which could also be a source of value. Neither is likely to be as exposed as retail to reputation risk from the CRC but there will inevitably be comparisons by industry sector.

Public sector

The public sector is facing tremendous budgetary pressures and has been re-organising its energy contracts using more centralised and collective purchasing. Some public sector organisations may review their preferred supplier and be seeking out best energy purchasing practices as a way of finding cost savings. The public sector places importance on achieving budgets, using hedging and risk management strategies to give certainty to expenditure. In this regard, it is perhaps more risk averse than the private sector.

Since the public sector is mainly a service provider, there is little scope for load management, although on-site generation provides opportunities for additional revenue generation and cost control, and renewables feed-in tariffs may offer an opportunity for positive investment. The emission reduction potential of public sector organisations tends to be lower than that of the private sector, and budget cuts may impose further constraints. This could also see the public sector participants placed disproportionately lower down in the CRC league tables.

