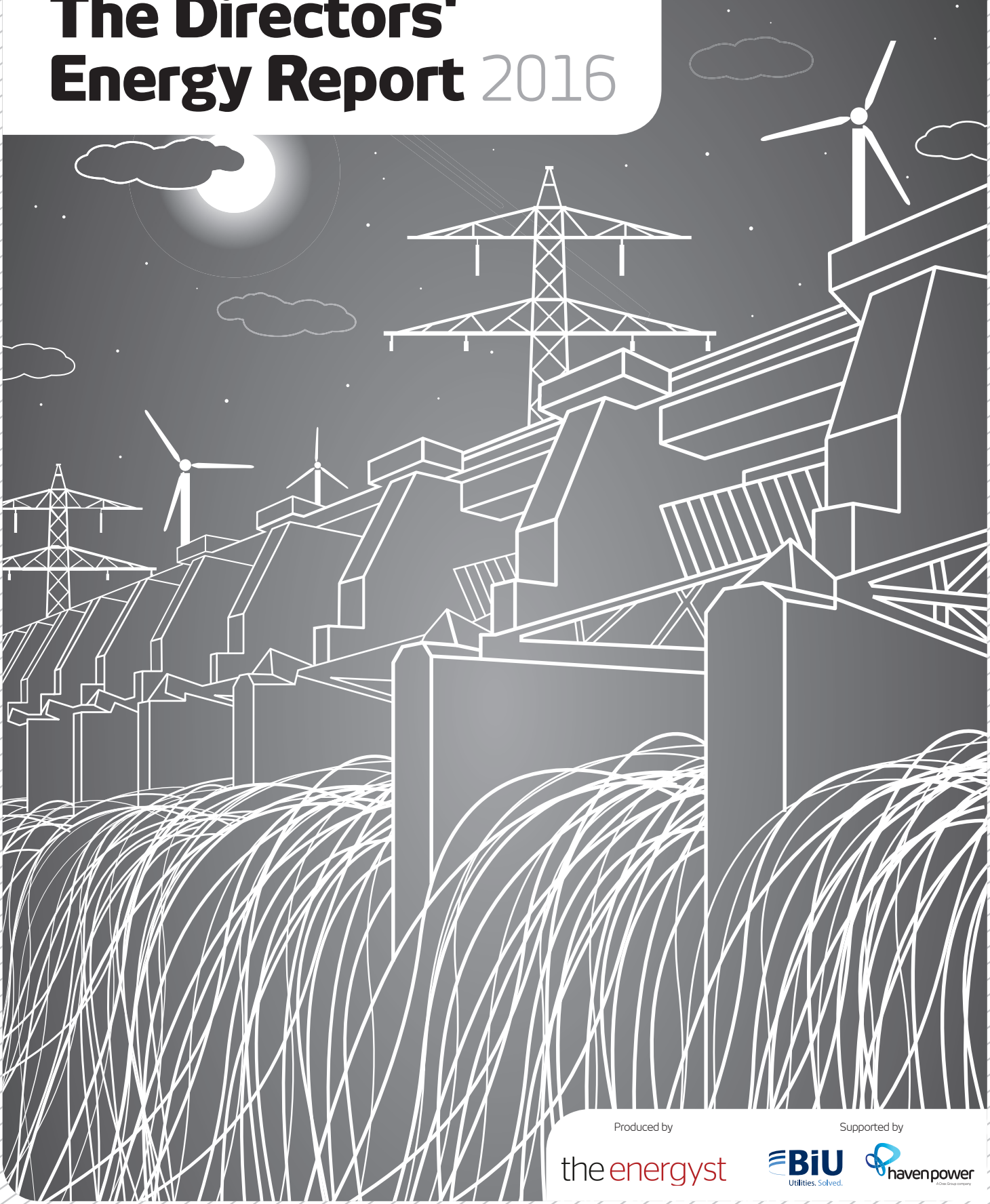
The Directors' Energy Report 2016



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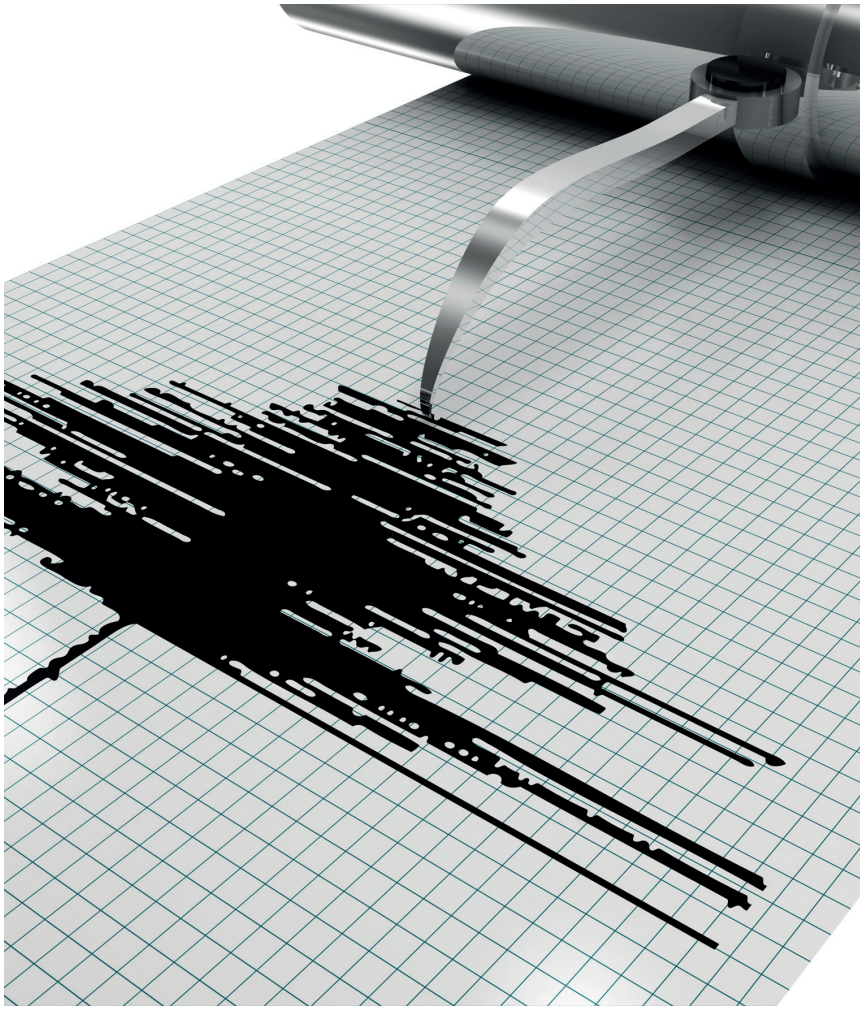
Winners and losers

2016 sees the UK move towards a 'smarter' energy system and the last year of monopoly water supply. For businesses that represents both a risk and an opportunity.

Wholesale energy prices are at multiyear lows and many brokers predict further softening into 2016. But that doesn't mean directors should shelve efficiency projects. In fact, the opposite is true.



PRICE PRESSURE

The reasons for declining wholesale energy prices are manifold. Global oil prices are tanking, with some predicting long-term stagnation. More LNG is expected to come onto the market in 2016. Meanwhile growth of renewable electricity is creating negative power prices, leading to further market repercussions. All of that comes against a background of economic growth decoupling from energy intensity.

VOLATILE POWER PRICES

In the UK market, lower wholesale prices are counteracted by rising subsidies and network charges. Thermal generators also have to pay the UK's carbon tax, which is much higher than that paid in Europe. That makes some coal and gas plant uneconomic, increasingly the likelihood of closures. Power system margins are already extremely thin and the lack of spare capacity will likely manifest itself in more volatile half hourly power prices and balancing costs.

That presents both an opportunity and a threat for UK businesses. As Ofgem and the power system administrators bring more companies into half-hourly metering this year and next, the number of firms affected by increased volatility will grow markedly.

WATER COMPETITION

Meanwhile, 2016 is the last year businesses will have to choose water supply from their local monopoly supplier. From 2017, the advent of water competition in England presents an opportunity to create efficiencies both in water consumption and in unit prices. In Scotland, where competition has existed since 2008, case studies published by the Water Commission suggest bill savings of up to 50% are achievable through increased efficiency and aggressive supplier discounting.

Therefore 2016 is arguably the most important time for directors to understand exactly where their business is resource inefficient. From an energy perspective, Esos should already have outlined areas for improvement. Ahead of water market competition, now is the time for a similar water audit.

ARE BOARDS TAKING ACTION?

This year's survey suggests energy is moving up the agenda, according to 80% of directors surveyed. That 93% plan to implement efficiency projects in 2016 is encouraging.

Despite that, the feeling remains that many boards see utilities as non-core business. It will be interesting to see whether spikier power prices adjust attitudes this year, followed next year by the prospect of significant water savings. A competitive advantage or disadvantage is at stake.

(The survey was carried out with 51 directors by the theenergyst.com in November/ December 2015)

Power is only half your power bill

Wholesale power prices declined for 2015 with anticipated softening into 2016. Yet, over the next few years, bills are expected to rise and the market to become increasingly volatile. What does that mean for energy procurement strategies?

Average wholesale prices are in decline and set to remain depressed for the next few years. But tighter system margins, more intermittent renewable power and changes to the way the energy industry has to balance supply and demand will make half hourly prices much more volatile in 2016.

That is something businesses will need to watch carefully: If it is more expensive for suppliers to balance their portfolios they will inevitably pass on the cost to customers. Then there are rising non-commodity costs, which make up about half of the bill.

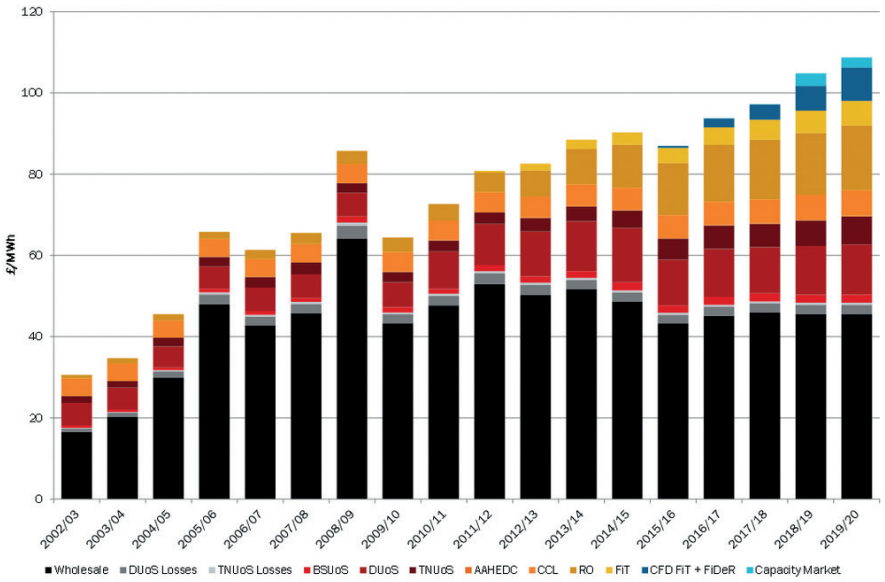
THE NON-ENERGY BILL

Transmission and distribution elements make about a fifth to a quarter of the total – and they are on the rise. Charges to subsidise renewable energy make up a similar proportion and are also rising. Over the next couple of years other government policies such as the capacity mechanism – which pays generators to be available when needed – will kick in, adding percentage point increases to the total bill.

The government has agreed to protect some of the most energy intensive industries from the impact of rising policy costs. But that means everybody else will pick up the tab, adding more cost to the equation.

That means energy procurement and management become even more closely linked.

Utilitywise



PROCUREMENT: FIX OR FLEX?

It's tempting for some businesses to lock in current low wholesale prices. But Jon Ferris, strategy director at Utilitywise, says energy buyers should stay flexible. He thinks the market may fall further.

"We recommend ... a long-term flexible framework that allows you to buy and sell in response to the changing markets," says Ferris. "If there is an opportunity to buy, you don't have to go through a lengthy tendering process – because you have already been through it."

DEEPER AND DOWN

Germany provides an example of the impact renewable generation can have on power prices and why fixed contracts may prove expensive.

"Increased renewables on the grid have reduced German wholesale prices for ten years. It is certainly not a given that we will see a bounce in wholesale prices next year," Ferris says. "With a flexible framework, if you see a bounce in prices, you are in a good position to respond however the market reacts."

However, he says firms must mull their contract tariff structure and whether they want to fix the policy plus other rising non-commodity costs. To do so carries a premium, says Ferris. "So it may be preferable to fix [non commodity costs] year by year when there is more certainty about what the absolute total will be".

SHAPE UP

Tariff structure also requires thought. There are 'baseload and shape' options where for a fee consumption is flattened so that firms do not have to worry about spikes in prices.

Or buyers can choose exposure to the real time cost of consumption, explains Ferris. "But for that you need an understanding of how consumption can be managed and feed that into control project evaluation."

And there lies the rub. While 40% of firms polled for this report claimed they could be more flexible, many businesses cannot easily change consumption patterns. Even those that can shift may see insufficient

2015/16

Noveus Energy

DESCRIPTION	£'s	%	Forecast
Energy (incl. Losses)	£4,638,102	51.9%	↓
Supplier Costs (incl. Margin & Risk)	£180,000	2.0%	→
Transmission Charges (TNUoS)	£736,458	8.2%	↑
Distribution Charges (DUoS)	£897,116	10.0%	↑
Balancing Use of System Charges (BSUoS)	£186,257	2.1%	↑
Renewables Obligation	£1,285,600	14.4%	↑
Feed-in-Tariff Charge	£425,000	4.8%	↑
Climate Change Levy	£554,000	6.2%	↑
Contracts for Difference (CfD)	£4,154	0.0%	↑
Capacity Mechanism (CM)	£1,046	0.0%	↑
Other Charges (BSC, AAHEDC, Metering)	£30,014	0.3%	↑
TOTAL ESTIMATED COST	£8,937,746	100.0%	

2016/17

DESCRIPTION	£'s	%	Forecast
Energy (incl. Losses)	£3,777,450	43.7%	↓
Supplier Costs (incl. Margin & Risk)	£180,000	2.1%	→
Transmission Charges (TNUoS)	£819,899	9.5%	↑
Distribution Charges (DUoS)	£971,486	11.2%	↑
Balancing Use of System Charges (BSUoS)	£214,195	2.5%	↑
Renewables Obligation	£1,462,000	16.9%	↑
Feed-in-Tariff Charge	£478,000	5.5%	↑
Climate Change Levy	£559,000	6.5%	↑
Contracts for Difference (CfD)	£140,234	1.6%	↑
Capacity Mechanism (CM)	£13,992	0.2%	↑
Other Charges (BSC, AAHEDC, Metering)	£30,014	0.3%	↑
TOTAL ESTIMATED COST	£8,646,270	100.0%	

incentive to do so. However, that may change as power becomes less than half of the bill.

DEMAND RESPONSE

Changing consumption in response to market signals takes many forms, but is known collectively as demand response. Ferris thinks the demand response market is "at a turning point".

"If you can shift your consumption the rewards are increasing", he says. "If you can't the costs are going to grow." But he feels that the incentives for some participants may be insufficient.

"The problem is that there are so many beneficiaries of demand response that the costs are centralized," says Ferris. "If organisations bearing the full cost don't receive the full benefit, it is hard to make a business case for it. The supplier may benefit, the distribution company may benefit, National Grid may benefit and consumers may benefit from less spiky prices... But [for the business investing], in many situations, the cost benefit doesn't really stack up."

Perhaps that will change over the next year, as more businesses are moved onto half-hourly metering and settlement. Firms that fail to manage consumption may find power bills far higher then pre-half hourly settlement.

But other policies, such as the capacity market, may end up dampening price signals, which would further fragment signals for demand response, according to Ferris.

RISK AND REWARD

Bobby Collinson, managing director of consultancy Noveus Energy, agrees that the energy market will be increasingly volatile, but says that's no bad thing.

"At the moment, volatility is the name of the game. But volatility is good, because it creates opportunity for people who are actively managing their energy," he says. "Overall in the energy market, the active buyer generally gets better results."

For the last three years, Collinson says the day ahead market has outturned monthly purchasing by about 5-6%, which has outturned seasonal (annual) pricing by around 10%.

That is before risk premiums are factored in and premiums for long-term contracts will rise as the market becomes spikier, says Collinson. "In a volatile world, the risk premium becomes quite expensive, even disproportionate," he warns.

"To optimise your position you are better off buying flexibly - buying short with a strong risk management policy on when to lock out," says Collinson. "Take advantage of the market falling but protect yourself from the market rising."

Matt Osborne, trading risk manager at energy procurement firm Inenco, agrees the wholesale market looks depressed and that opportunity exists for smarter purchasing and risk management.

"There is still potential for prices to come off, so we are not necessarily saying that customers should fix out their energy cost," he says. "If the market should bounce, then they should start locking out. But for now they should enjoy the low [prices]."

Has energy become more of a strategic focus for your business over the last 12 months?

Most respondents believe energy has increased as a strategic focus. These results contrast with our *Financing Energy Efficiency* report, published in May, in which half of respondents felt energy efficiency was not a board priority.

It may be that increased politicization of energy issues is driving energy up the agenda. Impending cuts to renewable subsidies, changes to business energy taxes and thin generation margins may have had some impact. The arrival of the Energy Savings Obligation Scheme (Esos), which requires directors to sign off an energy audit, is also likely to have raised awareness of energy and energy efficiency matters.

Yes: 80%

No: 20%

Do you have an in-house energy manager/management team?

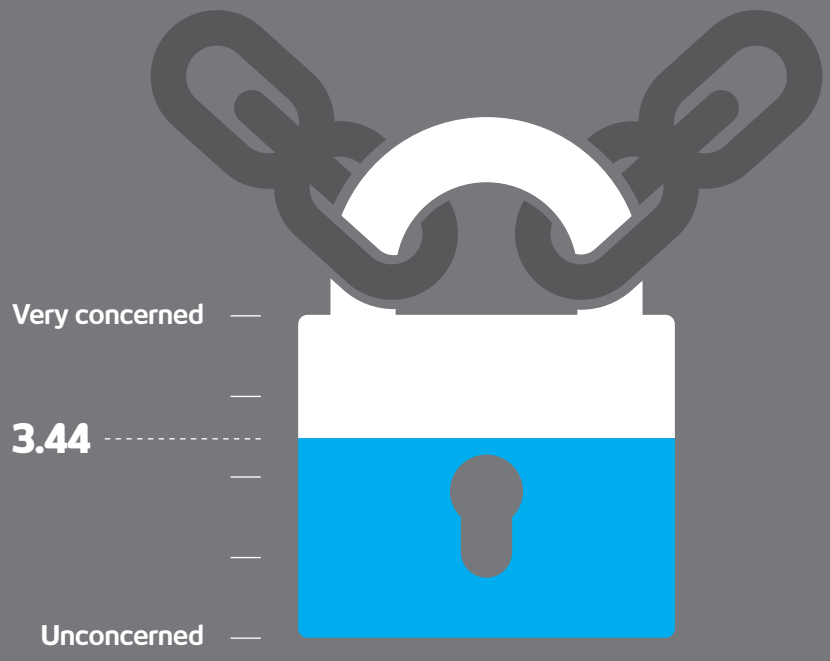
That two thirds of respondents have an in-house energy manager is positive, but may not be truly reflective of the wider economy. Energy Managers Association CEO Lord Redesdale told Energyst Media earlier this year that the lack of in-house energy experts would cause UK PLC serious issues should supply shocks and price spikes occur over the next 12 months. He believes outsourcing energy management is a mistake companies will rue as the UK's power generation margins fall away in 2016/17.

Yes: 67%

No: 33%

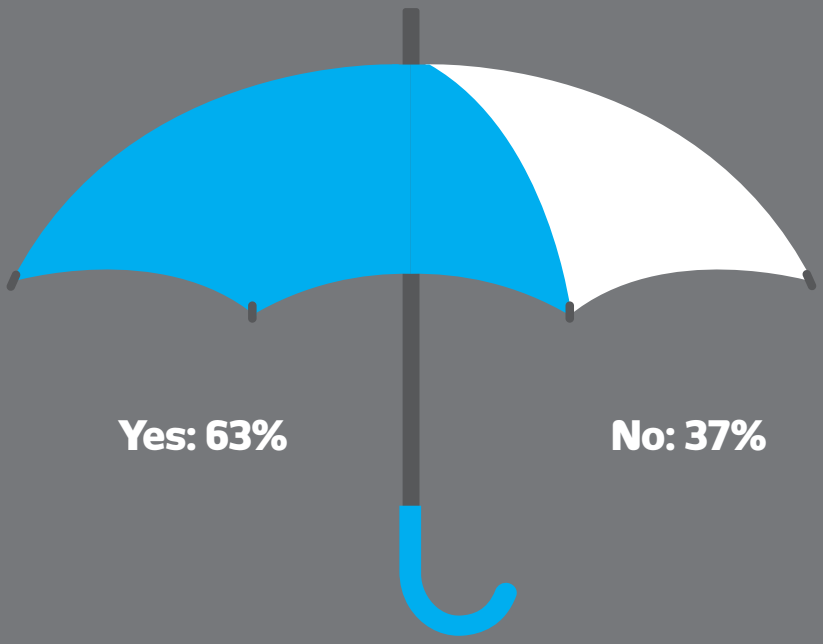
How concerned are you about security of supply over the coming three winters? (1 unconcerned, 5 very concerned)

Respondents have an eye on potential supply shocks. National Grid has repeatedly stated that it has the tools in place to manage the UK's tightening supply margins. But the margin of power generation over supply in winter 2015/16 is extremely thin, at 1.2% (although around 5% when balancing reserves are included). National Grid's own figures suggest next winter's margin, without demand side measures factored into the equation, may be negative. Meanwhile, gas storage at both Rough and Hornsea has been reduced.



Have you a plan in place to reduce exposure to energy supply or price shocks?

That two thirds of respondents have an energy risk plan is encouraging. Further closures of generation plant may increase volatility in the power market during the year, although analysts predict average wholesale prices will remain soft. Business risks this year include not just physical interruption to gas and electricity supplies, but also the possibility of price spikes. For larger companies, there is a threat that decisions made this year for the reform of the EU ETS post-2020 could leave them with inadequate carbon leakage protection and potentially facing large cost increases.

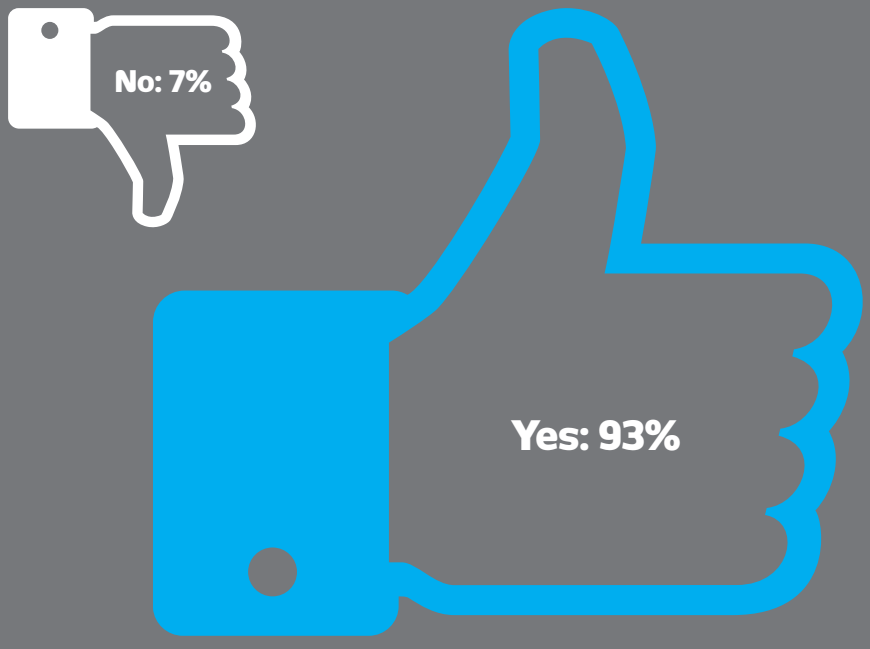


Have you implemented any energy efficiency/demand reduction measures in the last 12 months?

That around nine in ten of respondents engaged in some form of energy efficiency work in 2015 is a promising statistic. More than half of respondents are investing in energy efficiency with only a small minority suggesting it is either unfeasible or not a business priority.

Do you plan to implement any energy efficiency/demand reduction measures in the next 12 months?

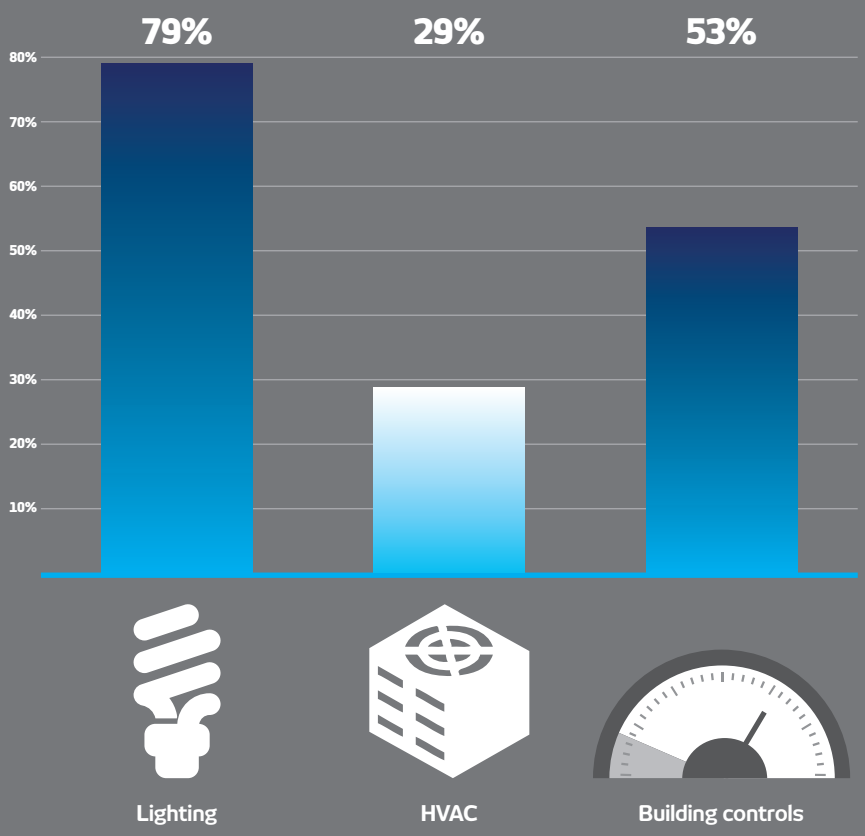
A similar proportion of respondents say they plan to carry out demand reduction or energy efficiency projects in 2016. While businesses in leased premises and multi-tenant blocks may struggle to make major changes in terms of more efficient heating, lighting and building controls, consultants believe that companies that have not yet made efficiencies can shave 10% off their energy bills at little or no cost. Process and behavioural change initiatives, if properly implemented with top-down support, can also help deliver significant reductions in consumption.

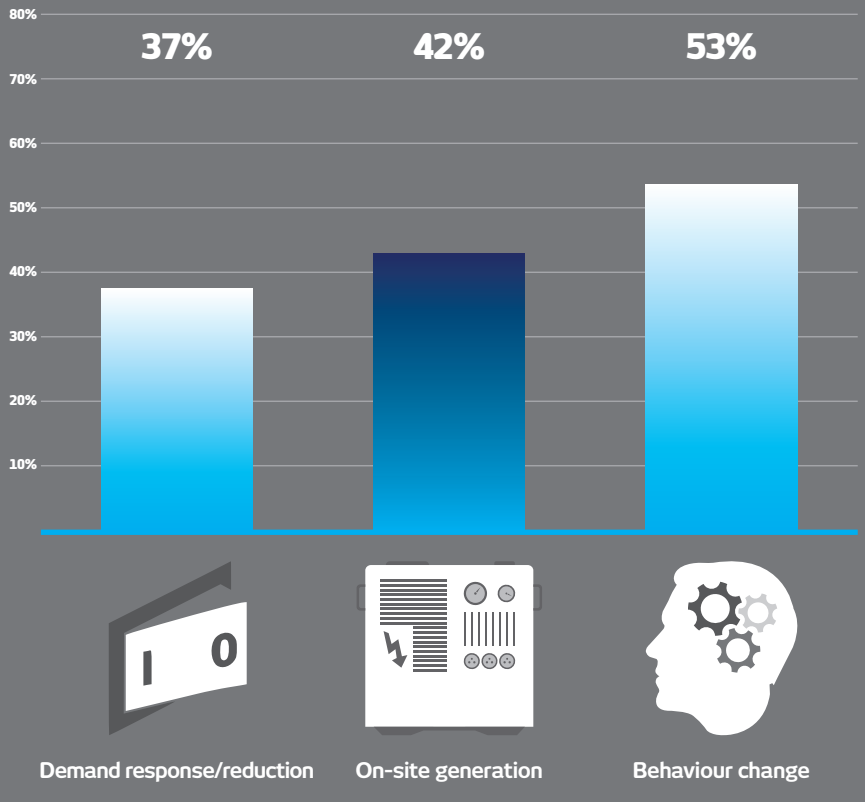


If yes which measures are you looking to undertake?

Lighting projects look to be the most popular measures. Lighting projects often have very short payback times, typically under two years, which make them attractive to finance directors. However, consultants believe that returns of less than a year are possible if lifecycle cost analysis is used rather than simple cash payback on energy savings.

The problem with picking lowest cost measures is that they often come at the expense of larger projects. However, it is interesting to note that more than half of respondents plan to invest in building controls and almost a third in HVAC equipment, which can often generate greater savings. That around four in ten plan to invest in onsite generation and demand side response/ reduction measures suggests that 2016 could see a significant ramp-up of DSR participation.

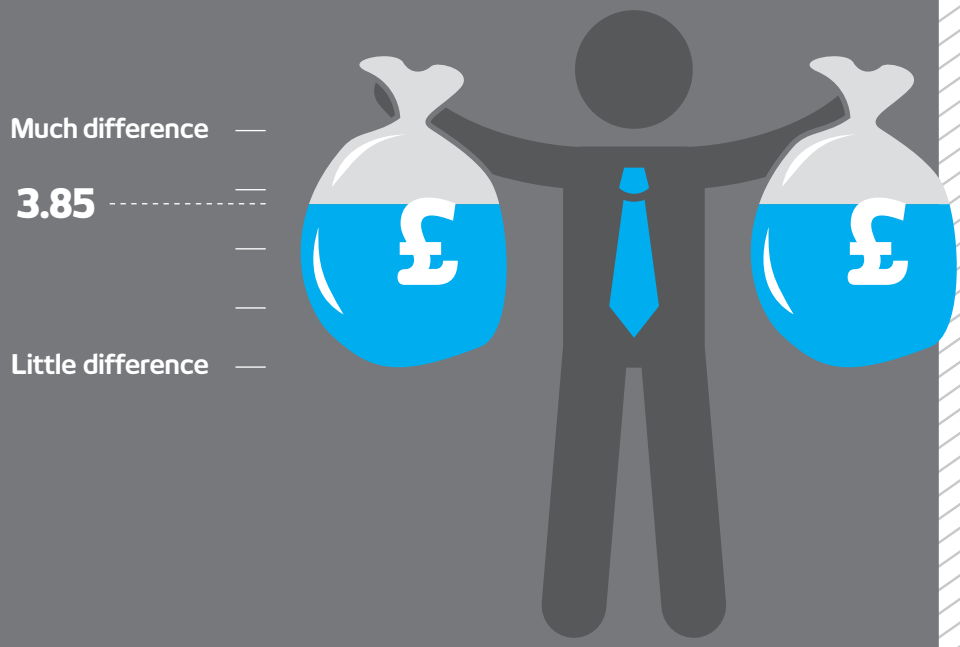




Would tax-funded incentives/subsidies for energy efficiency make any difference to your investment plans?

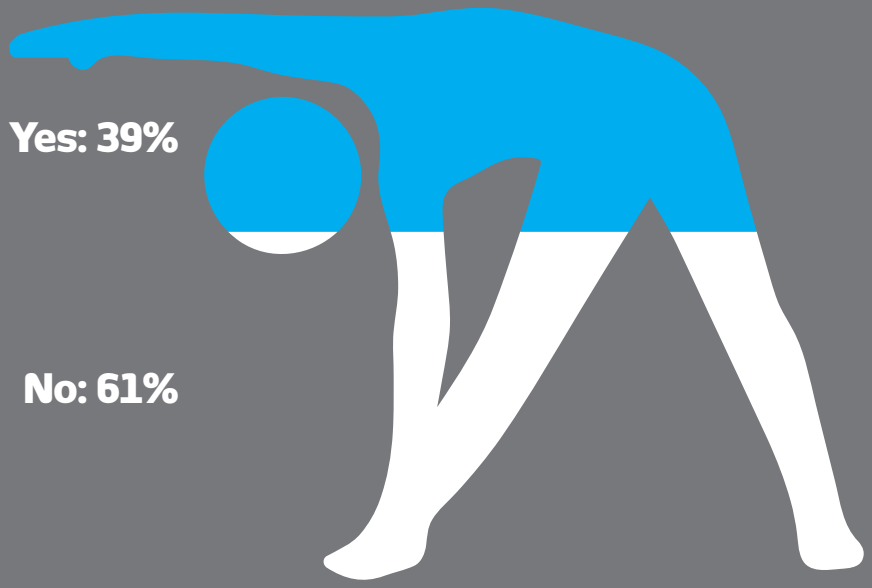
(1 little difference, 5 much difference)

Most companies would find subsidies for energy efficiency appealing. It may be that the Treasury considers some form of subsidy in its review of energy taxes. Options mooted in the consultation include feed-in-tariff style subsidies, supplier obligations and competitive fund allocation. The consultation also suggested that "government could match-fund' investments in energy efficiency and low carbon measures; and/or that there could be a link to audits (e.g. ESOS) whereby businesses could claim an incentive to cover the cost of implementing actions highlighted by audit reports, or in return for more reporting".



Could your business be more flexible in its shift patterns or when it consumes power?

Around four in ten firms say they could shift energy consumption. That presents an opportunity to mitigate the tightening generation margins the UK faces. It suggests that National Grid's plans to dramatically scale demand response by 2020 may be achievable. While the majority say they are unable to be more flexible, sharper price signals that reward flexibility may force a rethink of what is feasible. The migration to half hourly metering and settlement for more businesses throughout 2016 and into 2017 may help to deliver those price signals.



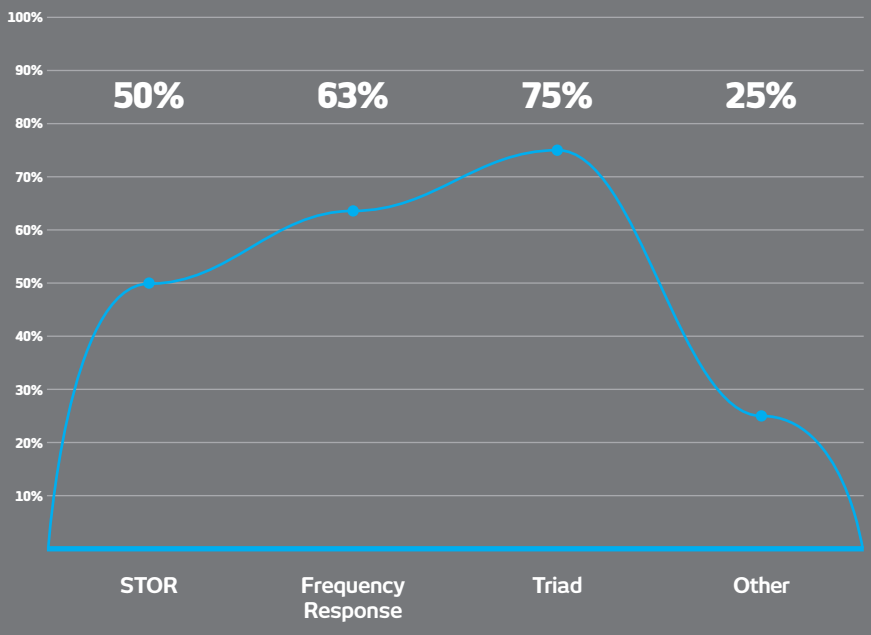
Do you participate in demand response mechanisms?

While many firms could be more flexible, and previous Energyst Media surveys have suggested a significant proportion could shift around 10% of their loads, only a small minority are participating in demand response programmes. Last year National Grid set out a major change in the way it balances the UK power system. It aims to achieve up to 50% of balancing via demand response by 2020. But the low level of participation suggests it will need to aggressively market and explain the financial rewards on offer to companies with suitable equipment and processes.

Yes: 13% **No: 87%**

If so which demand response mechanism do you participate in?

The Triad system of basing network charges on winter peak usage is well known: Large companies that avoid using power on the three peak periods can save significant sums. Short Term Operating Reserve (Stor) is also mature. It rewards companies that reduce power consumption or turn on generators at four hour's notice. Firms are paid both for being available and for taking action. Aside from the biggest sites, it is usually delivered via aggregators. Frequency response requires a much faster response with higher payments. National Grid will roll out new demand-side mechanisms this year. Note: Answers to this question may be skewed due to small sample providing demand response.

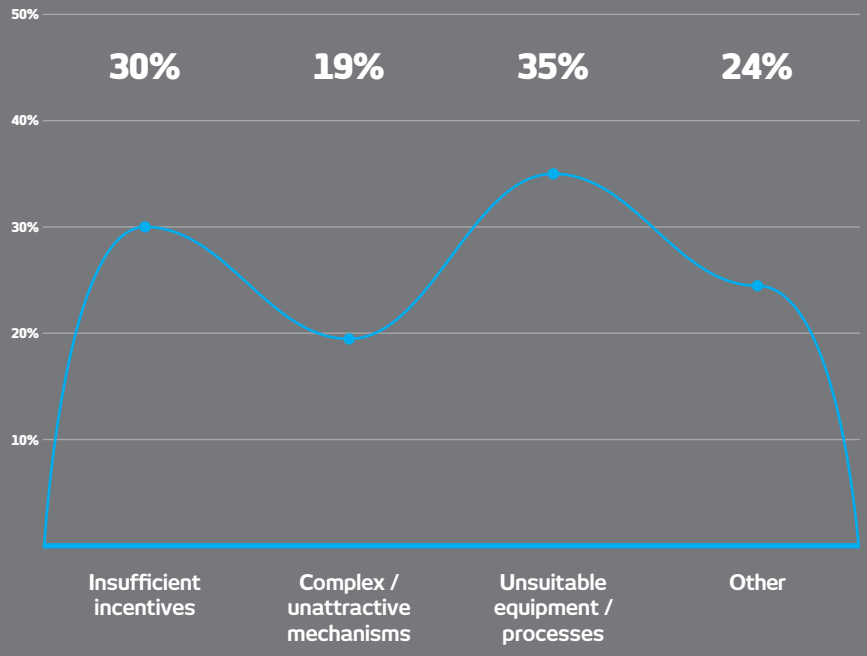


Is there a reason why not?

The complexity or attractiveness of demand response mechanisms appears the least influential factor in non-participation.

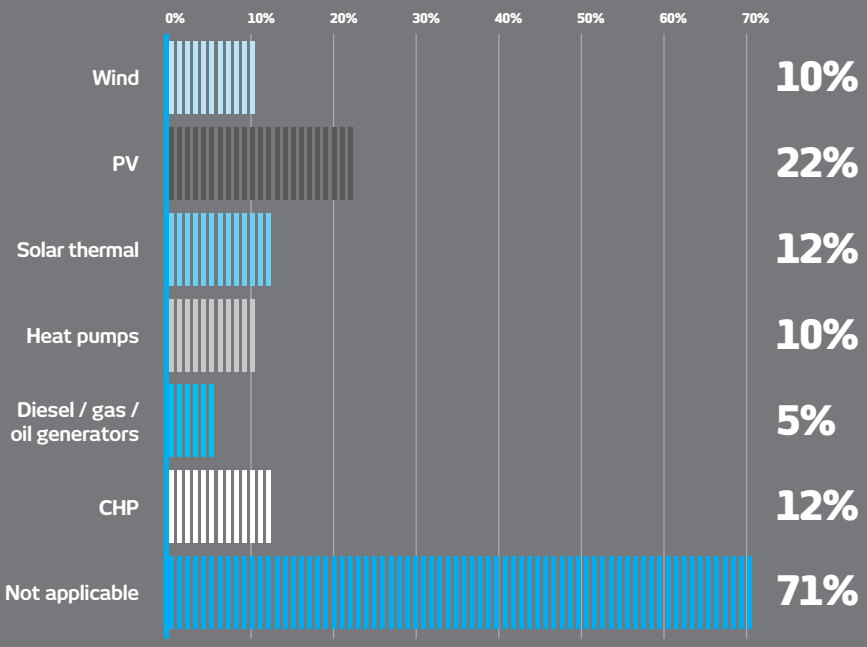
However, around a third of those polled want more money to engage. Slightly more cite equipment or process incompatibility.

The findings tally broadly with the survey conducted for our *2015 Demand Response* report. In that survey, the highest barrier to participation was perceived as unsuitable equipment or processes, followed by concerns about disruption to business continuity, a lack of understanding of the market mechanisms and insufficient financial rewards.



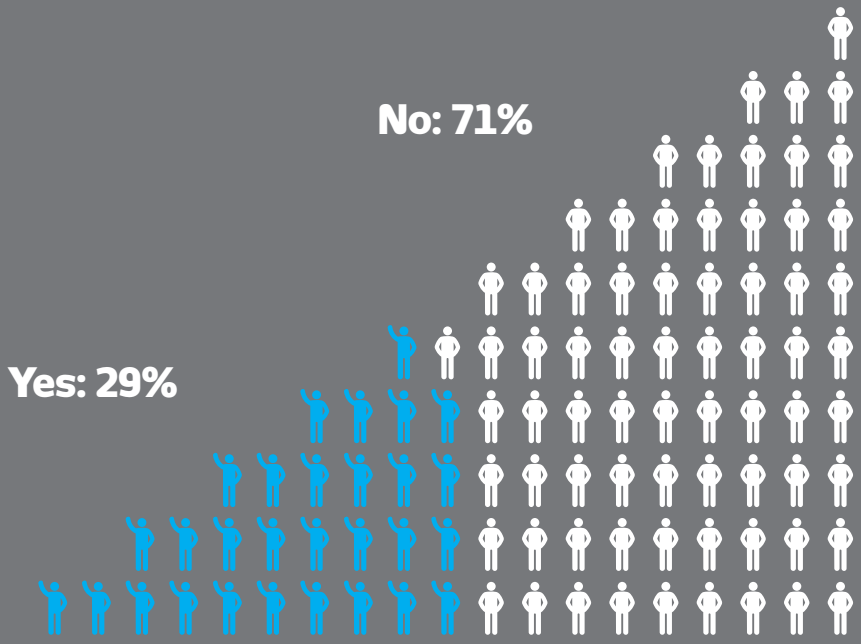
Do you have any form of on-site generation?

More than one in five respondents have onsite solar PV, which will mitigate price spikes if available during peak periods. Fossil fuel generators were the least reported forms of onsite power. However, cuts to PV subsidies may change that picture. Contracts handed to small diesel and gas generators in the capacity auctions are lucrative. Their ability to ramp up quickly and act as demand response units may increase investment in non-renewable onsite generation in 2016. Some consultants advise companies building new premises to install back-up generators first claiming they will pay for themselves before the site is finished.



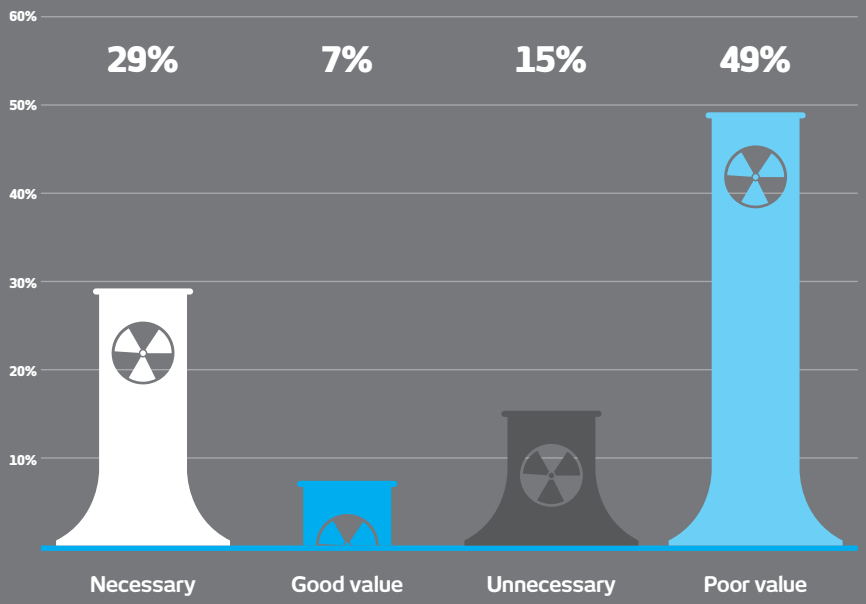
Are cuts to renewable subsidies necessary to curb rising power bills?

Respondents largely do not think the cuts are necessary. Intermittent renewable generation - some of which is embedded on the distribution network - is driving up network costs, and the cost of renewables levies are adding percentage points onto power bills. However, renewable generation is helping to drive down the wholesale price of power. Some brokers predict that the fall in wholesale power costs over the next year will be steeper than the rise in non-commodity bill elements such as network charges and renewable levies.



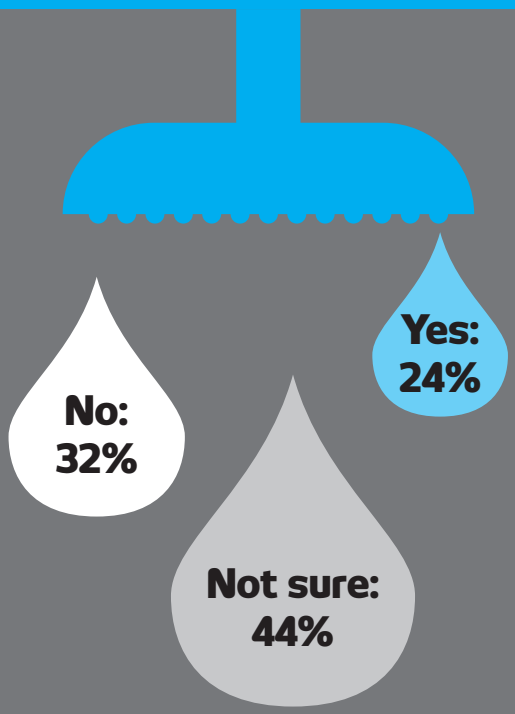
Is the proposed £17 billion of guarantees for Hinckley Point C...?

The drive for new nuclear power has been dragging on for years, but it appears EDF may soon commit to its final investment decision. The figures touted for financial support vary from £17-£24bn. City analysts have variously described the deal as "insane" and "an abomination". However, should Hinckley C be built, it will provide low carbon baseload power at a time when the UK may be increasingly short of other options. Around three in ten respondents think that is a necessary investment. However, only 7% believe the deal represents good value.



Have you noticed any improvement in liquidity over the last 12 months?

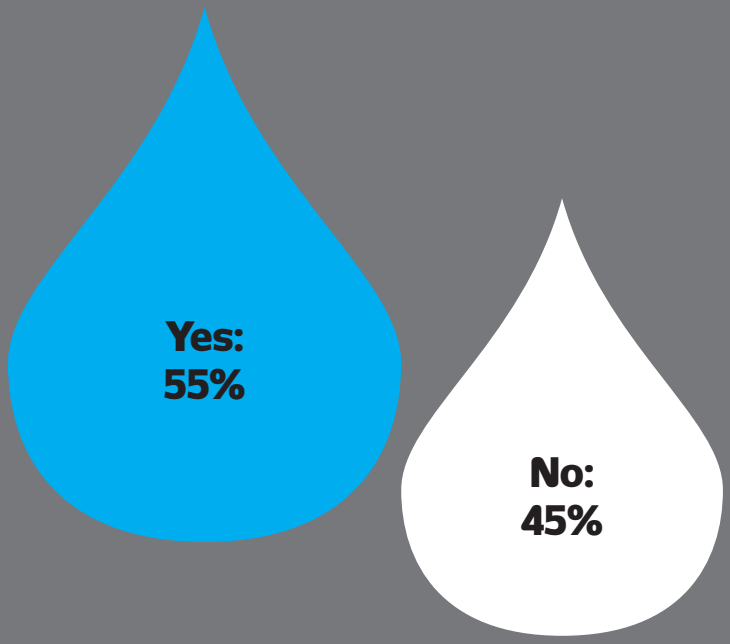
Respondents in the main are either uncertain or think that liquidity has not improved over the year. Regulator Ofgem introduced new conditions on energy firms in 2014 in a bid to make it easier for small suppliers to hedge their positions and thereby create a more competitive market. However, traded volumes in the latter half of 2015 were the lowest for some years. Whether due to market reforms or more benign market conditions, that suggests liquidity has not actually improved.



Is a lack of liquidity still a problem for businesses purchasing energy in the UK?

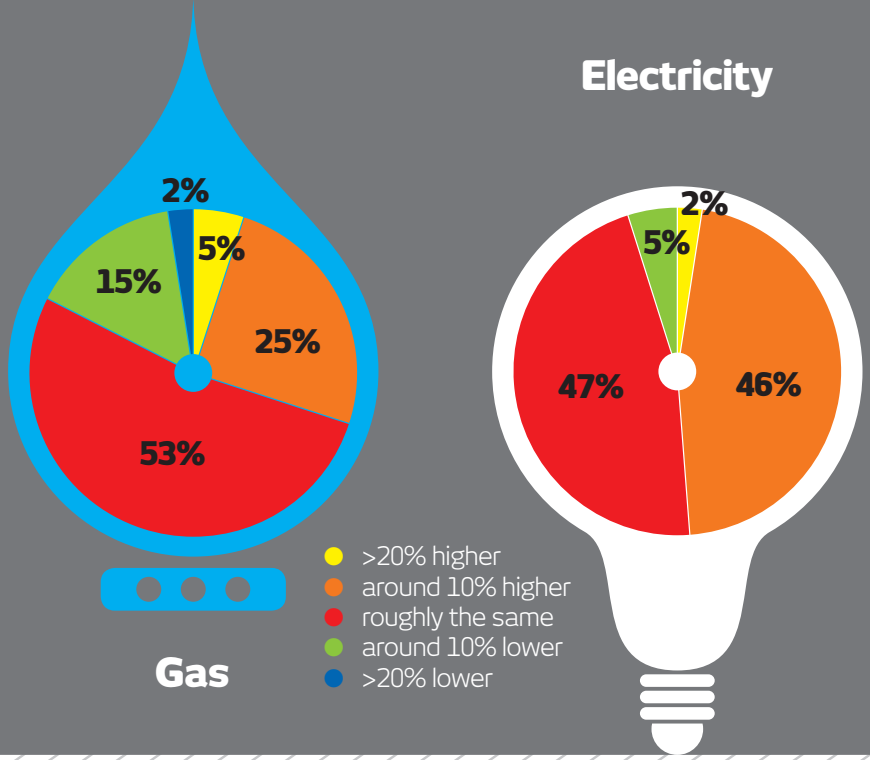
Roughly half of respondents think liquidity remains an issue for energy purchasing. It's a slight improvement on last year's *Director's Report*, where 60% said liquidity presented a problem.

Ofgem's reforms have received mixed reviews, with some traders feeling they have concentrated trades within two market marking windows. That has deterred speculative traders entering the market and improving liquidity – because they cannot quickly adjust positions outside the two daily windows. However, smaller suppliers have reported an improvement in ability to access the products they need, boosting competition in the supply market.



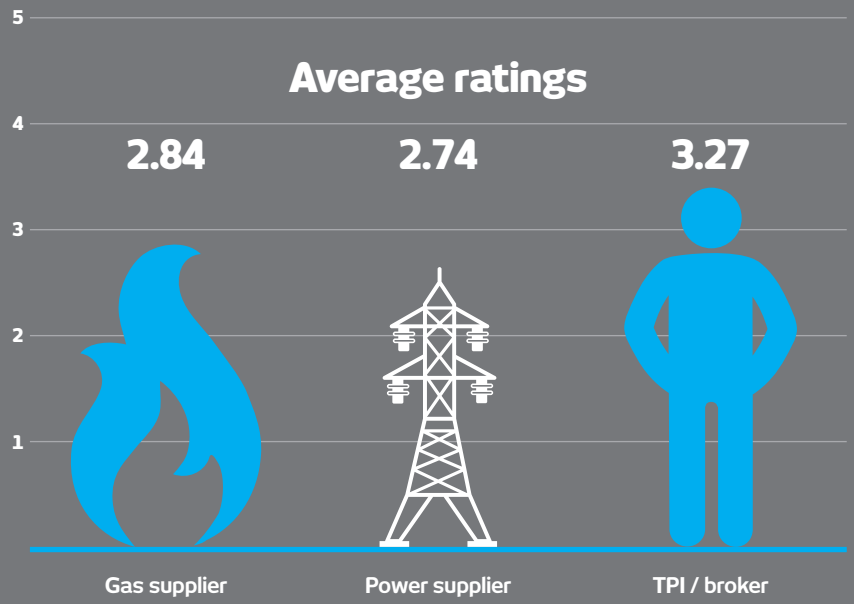
We are told that on average, wholesale prices are rising, yet for most of this year they were benign. How do you predict 2016?

For both gas and electricity roughly half of respondents think prices will remain flat. Analysts believe wholesale prices may fall further. For electricity, however, it will be interesting to find out if rising non-wholesale costs, the impact of P272 and tight power margins will drive up bills for some. While wholesale costs could represent less than half of the total power bill in 2016/17, all other elements are set to rise. That includes transmission and distribution charges, balancing charges, the renewables obligation, feed-in tariff charges, climate change levy, contracts for difference and the capacity mechanism.



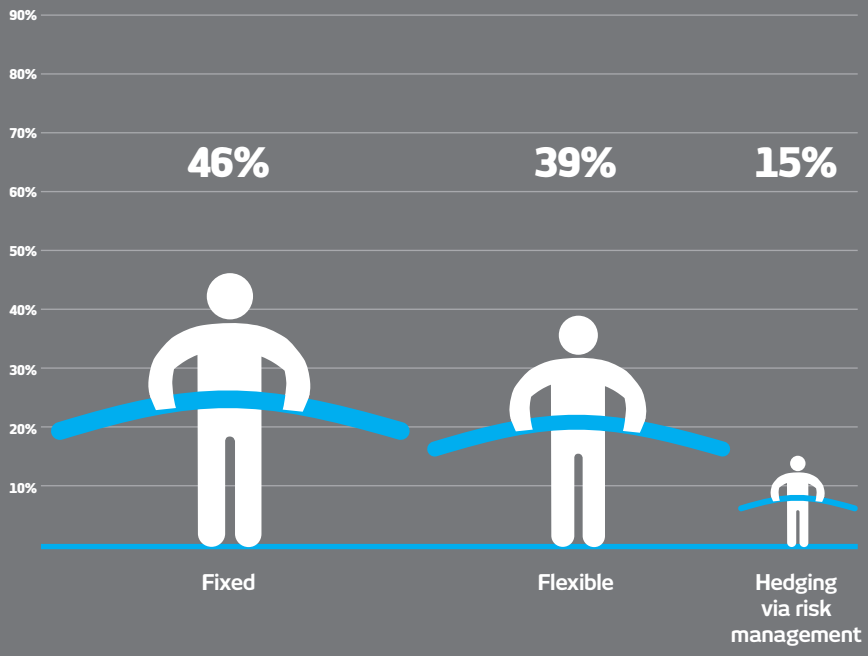
Out of five, how do you rate the transparency and trust from your supplier/TPI/Broker? (1 being poor, 5 being excellent)

Compared to last year's survey, trust in gas and power suppliers has declined slightly. Trust in brokers and third party intermediaries has improved. Perhaps efforts by some firms to improve transparency are paying off. However, the market still faces accusations of profiteering. Ofgem fined one broker-cum-business energy supplier earlier this year and the regulator may eventually uncover more sectorial malpractice. Meanwhile, the Competition and Market's Authority's investigation found that small businesses were being overcharged by both suppliers and brokers and called for third parties to reveal which suppliers were paying them for recommendations.



Is price certainty (fixed) more important to you more than potential cost savings (flexible) when purchasing your energy?

Responses suggest a swing towards more flexible purchasing than last year (where 59% stated a preference for fixed contracts). This may be because as the market continues to soften, companies are finding it more profitable to take advantage of declining wholesale prices using flexible contracts. Should the market pick up, they might need to lock in fixed deals, but for now they can enjoy favourable conditions.



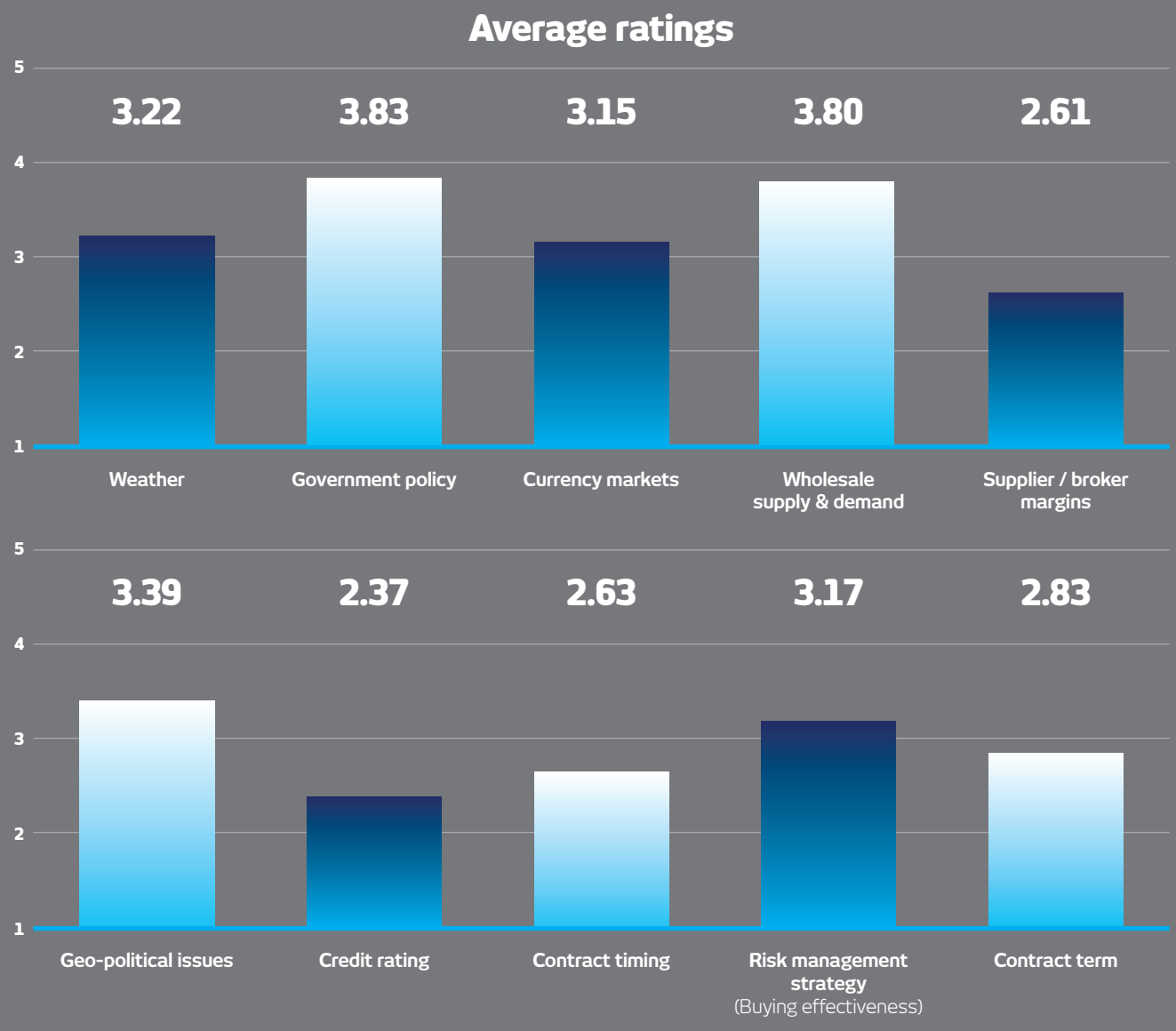
Do you monitor / quantify your purchasing effectiveness historically or against any benchmarks?

That roughly half of respondents say they don't benchmark purchasing effectiveness seems odd, particularly given that two thirds claimed to have an in house energy team. It might be worth finding out if their purchasing strategies are any good. What you can't measure, you can't manage.

How would you rate these macro factors out of 5 (5 being the most important) **in their effect on what you actually pay?**

Rating	1	2	3	4	5	Total	Average
Weather	2	10	13	9	7	41	**3.22**
Government policy	4	3	4	15	15	41	**3.83**
Currency markets	5	8	10	12	6	41	**3.15**
Wholesale supply & demand	1	3	9	18	10	41	**3.80**
Supplier / broker margins	9	12	10	6	4	41	**2.61**
Geo-political issues	2	6	13	14	6	41	**3.39**
Credit rating	9	13	16	1	2	41	**2.37**
Contract timing	5	14	14	7	1	41	**2.63**
Risk management strategy (buying effectiveness)	5	9	8	12	7	41	**3.17**
Contract term	4	13	12	10	2	41	**2.83**

As with last year's survey, government policy pips wholesale costs as the most influential factor, according to those polled. Wholesale costs currently make up around half the energy bill. Policy costs currently make up around 15-25% depending on the size of the business. But if wholesale costs continue to fall and policy costs continue to increase, and historic policy failures further reduce generation margins, the balance may continue to shift.



Blackouts: A genuine threat?

The UK's power supply margins are getting thinner. But are power shortages a real risk to business continuity or a significant revenue opportunity?

National Grid told MPs late in 2015 that the grid itself is 99.9999% reliable. However, the margin of generation over demand is at its thinnest for some years. That has led to increased talk of blackouts.

Head of the Energy Managers Association, Lord Redesdale, predicted some months ago that the UK would face power shortages by the end of 2015. He has since revised that prediction to blackouts or brownouts "this winter".

National Grid called its first Notice of Insufficient Supply Margin in four years in November. That led to some power generators being paid much higher prices than normal for their power for a short period in order to balance the system. Much newspaper coverage followed, and Grid was called before MPs to reassure them that the country was not actually facing blackouts.

In a nutshell, the system operator said that NISMs were 'business as usual', and that it anticipated issuing between 7-10 such notices over this winter. At time of writing, no further calls have been issued.

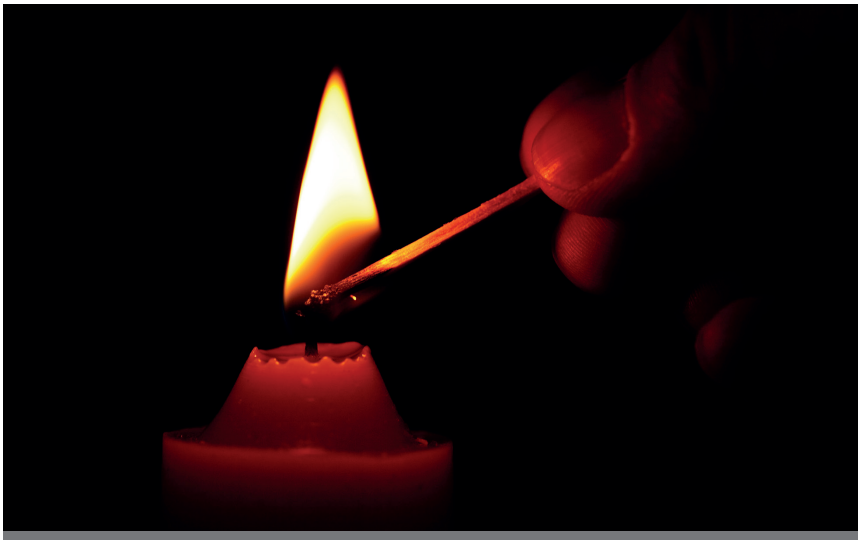
However, the coming winter is causing greater concern. National Grid has stated it will need to procure "at least as much" standby capacity to keep the system in balance. While the margin for this winter is 1.2% (upgraded to 5.1 percent with standby balancing plant and demand-side response providers factored in), further power station closures this year could take margins close to zero.

Tellingly, those dismissing blackout fears this winter are less bullish about winter 2016/17. Utilitywise strategy director Jon Ferris, for example, wrote in response to Lord Redesdale's blackout call that reduced demand, increased energy efficiency, regulatory changes and more tools in National Grid's locker to manage peak demand would prevail. He made a bet with Redesdale that the lights would not go out – and won. However, he will not make the same wager for winter 2016/17.

National Grid has rejected analysis by the Centre for Policy Studies that suggests a capacity shortfall of several gigawatts for next winter and has insisted it has the tools to keep the lights on. But Grid has repeatedly stated that margins are tight, particularly prior to the capacity mechanism launching in 2018, and that it needs to scale demand-side response.

That represents a threat to business continuity - and an opportunity for firms with on-site generation, back-up power and the ability to shift loads in response to market signals.

Businesses should assess such threats and opportunities. While wholesale prices are currently low, capacity shortfalls along with changes to the way generators have to balance their positions and increased half-hourly settlement for business energy users will likely mean much spikier prices. Which could be far more costly than then lights starting to flicker. Or far more lucrative.



From NISMs to blackouts explained

National Grid's Duncan Burt explained the steps between tight margin calls to blackouts to MPs late last year.

First comes the Notice of Insufficient Supply Margin (NISM). If things continue to get tight and generators and demand response providers do not bring forward enough reserve, National Grid issues a High Risk of Demand Reduction (HRDR) warning. "Then we would look at market response and ongoing reliability," said Burt. "Most of the time that will be adequate. If we continue to have difficulties or further losses we would move into emergency measures, such as calling on generators for assistance."

Burt said National Grid could also use 'MaxGen', where generators are called on "to open all the stops" and generate above their normal load for a short time.

After that, Grid asks the distribution network operators to reduce voltage (brownouts). "Typically that would be enough to achieve balance," said Burt.

If not, it tells the DNOs to start disconnecting customers, "which we would expect, over the peak, to be for a very short period and very limited in geographical scope as to where that happens," said Burt.

National Grid's loss of load prediction – the amount of time over the year it anticipates having to take emergency measures – is 1.1 hours.

2016: The year P272 will hit your power bill

2016 is the year more companies will be charged not just for how much power they use, but when they use it. A piece of regulation called P272 means that a further 160,000 businesses will have their usage settled on a half hourly basis. With industry experts predicting more volatile half hourly prices, that represents a major change and could have significant cost implications for businesses in the SME sector and upwards.

THE COST IMPLICATIONS

Between November 2015 and April 2017, some 160,000 businesses in profile classes 05-08 will move to half hourly settlement. That means they will be more fully exposed to use of network charges at both distribution and transmission levels. Essentially they will pay more or less depending on the time of day they use power.

Their transmission network charges will be based on how much power they use at the most expensive times periods and the price signals will likely be much sharper. The problem is, most firms will not know when those periods, known as Triads, actually fall until afterwards, as they are set retrospectively.

Distribution network charges may also become more volatile, partially due to the effect of intermittent renewable generators connected to local grids, although the most expensive periods will probably remain the evening peaks.

Basically, P272 means that rather than being charged based on an 'average' profile, businesses will now be billed and settled for exactly the amount of energy they take from the network on a half hourly basis. Firms that use more power at peak times will therefore pay more for their use of the distribution network. Firms that use less will pay less.

Given that network charges typically make up 20-25% of electricity bills, the cost implications for businesses could be significant.

WHY IS HAPPENING NOW?

Regulator Ofgem believes that half hourly settlement will make the costs suppliers face in buying and transporting electricity much more accurate. It thinks that will deliver stronger incentives on suppliers to promote energy efficiency. Suppliers' business customers will now be fully exposed to time of use tariffs and will therefore have to think more carefully about when they use power – or pay the full cost. That should lead to more efficient balancing of the power system, which will be required in a market with less spare capacity. The regulator thinks it will also improve competition in the supply market.

IS YOUR FIRM AFFECTED?

Your business will be affected if the first two digits of your power bill's MPAN or Supply Number (S-Number) starts with 05, 06, 07 or 08.

If you already have an accredited automated half hourly meter, your business will be settled half hourly within 45 days of supplier change or contract renewal. If you do not already have the half hourly meter but fall within the 05-08 profile classes, suppliers must install one and align all the associated services by next April or face fines.

WHAT YOU HAVE TO DO

P272 presents some administrative burdens. It means those 160,000 companies need to appoint an accredited meter operator (MOP) and data collector (DC) and a data aggregator (DA). In short:

The MOP is responsible for meter installation and service.

The DC is responsible for collecting energy consumption data from your half hourly meter and presenting it to your energy supplier.

The DA (which is appointed by your energy supplier) takes that data and works out how much power your site has used, upon which data your bill is based.

All of those services are chargeable and prices vary by supplier, so shopping around for the best quote is advisable.

THE UPSIDE

Businesses that can reduce demand permanently will obviously benefit from lower power costs. Firms that can shift loads at times of peak demand will not only pay less for their power but may also have the opportunity to earn revenue via demand-side response programmes operated by National Grid, local grid operators and commercial aggregators.

So if it's not already in hand, now is the time for directors to plan for P272.

Demand response: Balancing your bottom line in 2016

National Grid has launched a major push to increase the amount of demand response it can access in order to balance the power system. Meanwhile, more and more businesses will have the ability to become demand response providers as they are moved onto half hourly settlement via P272. Directors should be aware of the implications from a cost and revenue perspective in 2016.

As generation margins fall and increasing amounts of renewable generation affect the economics and the operation of the power system, the system operator will have fewer options to balance the system by using power stations. So it will pay companies with on-site generation or the ability to turn up or down their power consumption when required in order to keep the system running optimally. National Grid last year announced an ambitious target to achieve up to half of balancing from demand side response by 2020.

Simultaneously, more companies will find their power is settled half hourly. That means they will be exposed to time of use tariffs. For larger companies, that is nothing new, but 160,000 more firms will be affected by April 2017 (see p19).

Directors may find the types of demand response outlined here have potential upsides and downsides for their business from this year onwards.

DEMAND SIDE RESPONSE

Triad and red zone avoidance are probably the best known forms of demand side response. But as well as avoiding costs, companies can earn revenue by agreeing to shift a set amount of power – that is turning up or down – through contracts with National Grid, via aggregators or direct with their local network operator. Firms with onsite generation can also contract to turn on when called upon.

There are numerous other forms of demand side response and National Grid is launching more products as part of a major drive to scale this way of balancing the national power system.

SHORT TERM OPERATING RESERVE (STOR) AND STOR RUNWAY

Operating for over a decade, Stor asks users to turn down demand or turn on generators in return for payment when there is a loss of power on the national system. Providers get paid for making themselves available, and again if they are actually used. Companies usually get four hour's notice and the service, which has aggregated about 2GW of reserve, is over subscribed. National Grid has now launched Stor Runway to enable more demand-side response providers to enter the market.

Stor Runway aims to deliver 200MW of demand side response and then feed it into the main Stor market. It allows new entrants to build

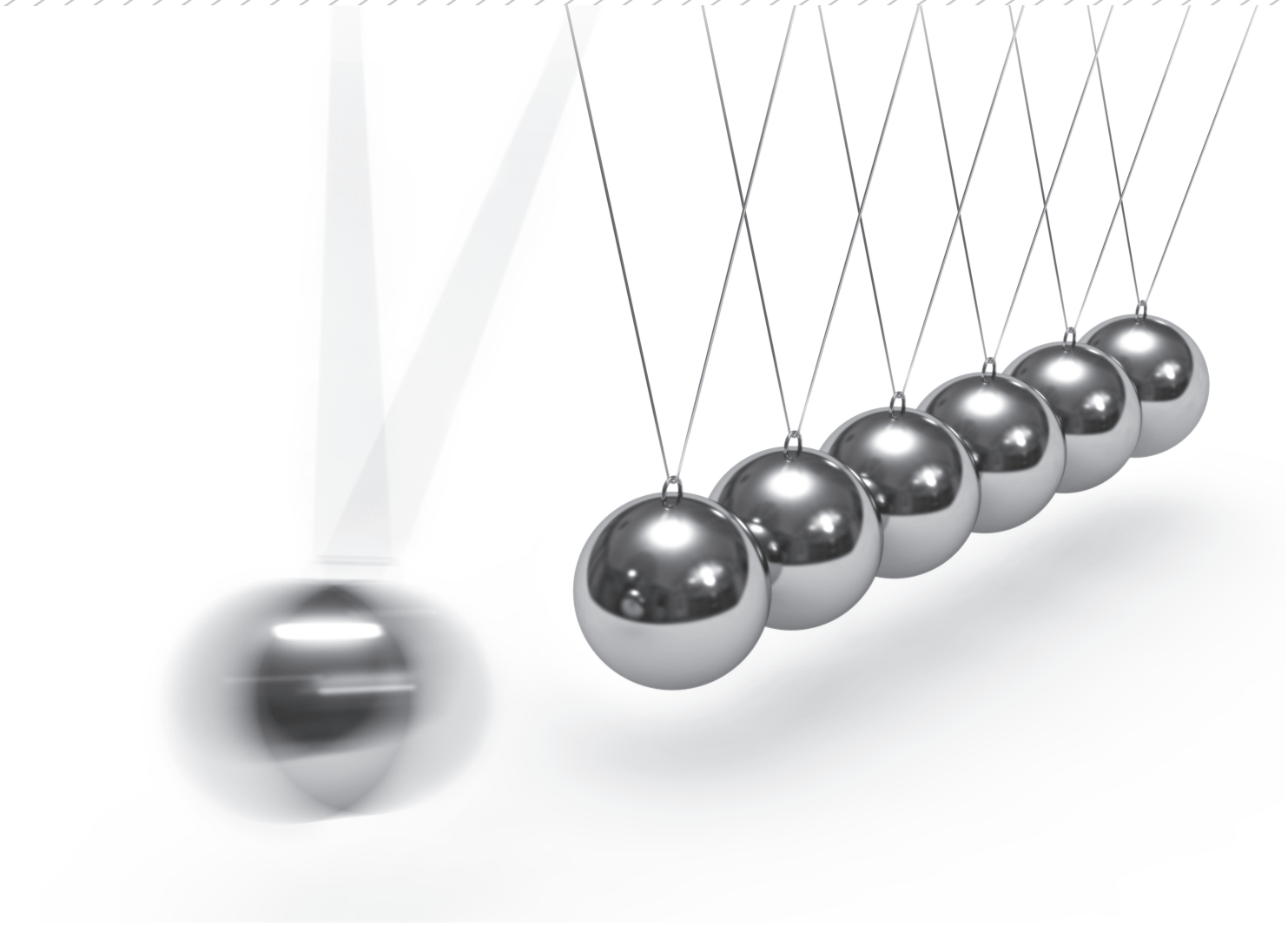
Triad avoidance

Triad is how National Grid charges major energy consumers for use of the transmission system, simultaneously flattening winter peak demand.

Triad periods are defined as the three half hours of highest peak demand over winter, at least 10 days apart. Annual charges for larger energy users are based on how much energy they used during those Triad periods. National Grid works out retrospectively when Triad periods occurred, making it a guessing game for businesses. But reducing usage during triad periods makes a big difference to bills, and as a result a service industry has sprung up around Triad avoidance. An army of third parties sends warnings to clients when they think a Triad may be imminent.

At that point, up to 2GW of demand will switch off. But transmission costs are rising and peak demand falling, so the costs of the transmission network are being recovered from a smaller volume of consumption and so rates have to go up to compensate.

Meanwhile, a flattening off of peak demand throughout the winter in combination with milder winters have made Triads more difficult to predict, so big power users end up turning down consumption much more frequently be certain of hitting a Triad. As supply margins and generation dynamics change, it may be that Triads fall outside of the traditional evening winter peaks, something major energy users may need to be aware of in 2016.



up their portfolios. Once they have achieved a megawatt, they can get paid, but they must reach a portfolio of 3MW by the end of this year. That means new market entrants will likely be aggressively pursuing UK business customers in 2016, which could make it more attractive to businesses.

FREQUENCY RESPONSE

Frequency response is a much faster form of response. Providers have to respond in seconds to grid fluctuations. Payments are usually much higher than for Stor and providers get paid for being available and if utilised.

Commercial demand side frequency response types include Firm Frequency Response (FFR) and Frequency Control by Demand Management (FCDM).

National Grid is also launching an even faster form of frequency response called Enhanced Frequency Response (EFR), where providers need to react to fluctuations in under a second.

DEMAND TURN-UP

National Grid is also launching a Demand Turn-Up (DTU) service in May that will pay companies to either turn up demand or reduce generation when required. This is largely to counter the effects of lots of new renewable generation, which is causing changes in the way the power system operates.

Further reading:
www.powerresponsive.com

Red zone avoidance

More firms will have to be aware of so-called red zones in 2016 because of the implications of P272 and half-hourly settlement.

Red zones are charges for using the local grid or distribution network at peak times. Distribution networks use a traffic light system for charges. For businesses, red should mean 'stop using power' if possible, and it typically falls on weekday evenings between 4pm and 7.30pm. The amber periods tend to be from around 7.30am until 4pm and again from 7.30pm until around midnight, with the green periods falling overnight.

Most firms operating daytime shifts will not be able to move much consumption into green periods. However, small tweaks to building controls, particularly around HVAC, can make a significant difference to bills and make return rates for any required investment relatively quick.

Ramping up UK energy efficiency – encourage or incentivise?

Post COP21 – a need for action not words. Consultant Mervyn Bowden on energy efficiency's future

Whatever your views on the outcomes and agreements from COP21 the messages around energy are clear. Produce renewably and, far more importantly, reduce and manage demand.

As the UK reviews its position on fiscal treatment of energy this is not always the plain sailing you would perhaps expect.

As a society we constantly find new ways to use more energy and, at a global level, this is partly linked to greater prosperity in developing countries but more so to exponential growth in population. Hopefully this will be balanced as least in part by technical improvement.

A lot of noise is made around events such as COP21, which certainly raises awareness of issues, extravagantly and bureaucratically, and makes it increasingly important that nations drive their own efficiency programmes. Whilst there's talk of a lot of collaboration "management by committee" has never been a cause for celebration, or success.

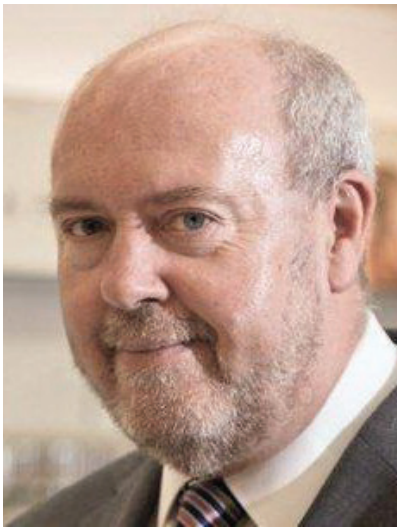
Speaking of committees, the EU is the master of bureaucratic confusion and demonstrates that "one size fits all" will never work. Not a recipe for getting things done successfully as I'm sure our own David Cameron will attest after his recent quaint attempts to persuade EU member states to change their ways to mirror our own rather inconsequential wants and needs.

SO, THE BURNING QUESTION, WHAT SHOULD WE DO?

Thinking primarily of buildings, which provide significant ongoing potential for savings, there are probably two sensible routes.

THE NEW AND REFURBISHED

Route one concerns new facilities, mainly buildings. Generally this, from observation, is on track, on the agenda and allows some of the most innovative technologies to be incorporated into designs. Encouraged and pinned down by progressively tightening Building Regulations and commercial

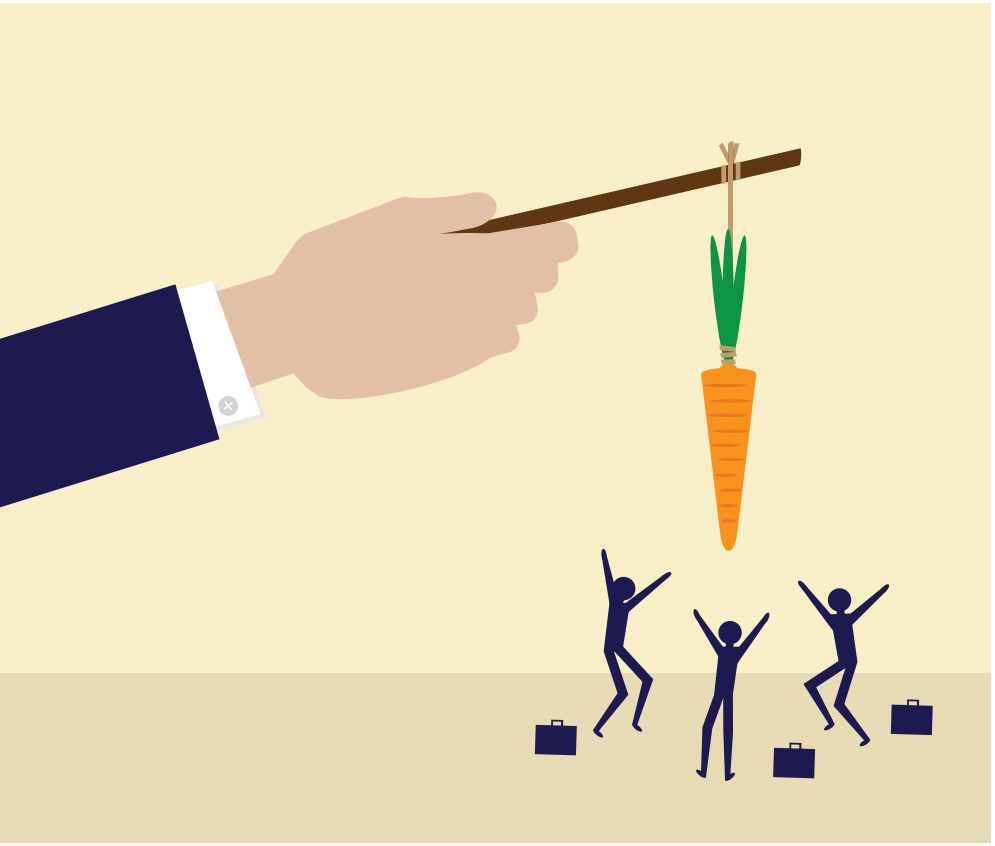


common sense new buildings are becoming ever more efficient and often incorporate renewable/shared energy generation as well as that improved efficiency. Similar efficiency is being driven through the transport and manufacturing sectors through their tightening of standards and increased expectations on performance and the economics which go with it.

The UK uniquely has set itself apart by setting eye-watering targets for a number of energy-related aspirations, risking placing us at a commercial disadvantage and risking corporate exits to lower energy price zones around the globe. There is much hypocrisy when comparing UK intensive user rates for energy against those in the rest of Europe.

Whilst much research, development, creativity and innovation have been, and are being, devoted in this space there are a number of ongoing flaws which must as a priority be remedied if progress is to continue apace.

1. Commissioning and handover of new schemes and buildings. Because of insufficient time allocation within project processes this area often suffers and sometimes doesn't happen at all, meaning that the expected design efficiency is, in reality, way below the planned level and costs those paying the energy bills significantly more than expected. Surely the main contractors should pick up the tab for this? Penalties should most definitely be applied by clients for a shortfall in performance but how often does this happen?
2. "Value engineering" continues to reduce capital costs at the major expense of future running costs by taking out key energy efficiency components from new builds and refurbishments. See also "design and builds" where contractors skimp on energy efficiency systems and equipment.
3. Management of ongoing performance is often missing and results in excessive energy consumption and running costs. Skills and expertise in running buildings effectively from an energy performance perspective are still far too scarce.
4. Innovative technologies often take far too long to become established and opportunities to introduce them earlier are missed.
5. Measuring and comparing energy efficiency still seems to be a major problem. Taking the (mandatory) Display Energy Certificates in the public sector one must lament their practical use for comparing energy performance – there is a need for urgent review which may come from the UK GBC's recent initiative.



MOVING TO THE EXISTING STOCK

The bulk of buildings, processes and vehicles – those that already exist – and with experience of the Energy Saving Opportunities Scheme, improving efficiency is probably more about the financials, ownership, energy management of assets and activities than it is about the actual technologies themselves.

Some of the fundamental problems have been associated with a complete absence of meaningful data on which to base scientific audit routines. A screeching need for an appropriate level of granular metering which is standardized, easy to collect data from and link to management controls would save £billions very rapidly but again needs linkage to some accurate form of comparison. The current programmes are too slow.

Lets not forget energy management skills. Very few buildings are run with energy efficiency as the prime driver - after core business of course. Energy management is often lumped in with FM, waste management, cleaning, sustainability and other activities which actually conflict with sound energy management. Take maintenance, for example, whereby plant and equipment is used well beyond its accounting life resulting in poor performance, breakdowns and additional cost rather than biting the bullet and replacing it. Similarly how many maintenance programmes are driven with energy efficiency as the prime consideration?

Energy management is massively influenced by finance. Whether it's related to market commodity costs, infrastructural needs or equipping facilities with "state of the art" plant, systems, lighting and more the concerns are over:

1. Making cost reductions
2. Return on investment
3. Availability of capital
4. Avoiding thinking about life cycle costs

This provides several potential areas where the government may usefully intervene (lite) to encourage energy efficiency.

WHAT CAN INFORM THE REVOLUTION?

I'd identify a number of key measures – mostly financial but some managerial – which would help:

1. Make energy efficiency a tax-deductible activity, any expenditure on efficiency schemes, R & D, monitoring and metering systems should be given a simple relief from Corporation Tax. This could even include the cost of energy management itself.
2. Measures should encourage, rather than purely incentivise, greater efficiency. Who needs subsidies when return on investment can top 50% p.a.?
3. Penalties from schemes like ESOS, whatever is chosen as the future demand side option, should be recycled into training, and licencing, qualified energy managers.
4. Perhaps a system of "energy efficiency capital credits" as a levy on I & C energy bills to artificially inflate the cost of energy and make efficiency more financially worthwhile. The credits could be used, perhaps through energy suppliers with services arms, to pay for energy efficiency work. Either way, a mechanism which rewards efficiency simply and quickly.
5. Replace the Enhanced Capital Allowance scheme with one or more of the above.
6. Set tangible targets for energy reduction and make it mandatory to have an auditable energy management plan covering perhaps five years forward setting out potential savings and the cost to achieve them. This would be of far more practical use than the woollier aspects of ESOS and could be incorporated into ISO50001 easily.
7. Mandate landlords immediately to sub-meter tenants on a retrospective basis. Landlords are some of the biggest energy suppliers, to their tenants, and don't suffer the degree of regulation applied to primary energy suppliers – perhaps they should!
8. Finally, I would link energy efficiency to Business Rates much as Vehicle Tax is linked to emissions.

MARKETING THE BENEFITS?

Taking some of the grander aspirations of COP21 it surely isn't sensible for a nation's flagship energy efficiency scheme to quote the benefits of saving 0.7%, as DECC does.

What about 40% or even 50% over a defined and manageable timescale with structured guidance, and incentives, for getting there?

And extend throughout SMEs.

What a difference a 50% cut in energy costs would make to most businesses – it won't come from the supply side so has to come from a radical and persistent approach to reducing demand.

Let us hope the government's current review drives an accelerating efficiency agenda – soon!

40:20:40 – The Energy Efficiency ratio

By Rupert Redesdale, CEO, The Energy Managers Association (EMA)

Energy efficiency is often seen as a process of replacing inefficient products with efficient products; however this seems a simple view of a complex problem. A simple ratio has been adopted by the Energy Managers Association (EMA) as a guide to understanding how energy efficiency can be valued.

The three main elements of energy efficiency are energy efficient product, building control systems and behaviour change. Allocating importance to these three areas is to a degree guess work, however the general consensus amongst experienced energy managers is that the 40:20:40 split is a fair estimate. The reason for promoting this ratio is that many decisions to achieve energy efficiency are often based on only one part of the ratio, with two remaining elements ignored.

> *There is one way to make training widespread and that is for the Government to make it mandatory. With power cuts at peak times around the corner this might just happen.*

Building controls are frequently used to match power-use to occupancy of a building, but even these systems can fail if unusual events happen or work patterns shift. Energy efficient products are understood to be a quick gain and the most common solution to achieve energy savings. Organisations see energy efficiency as a process based on efficient equipment, energy efficient lighting might limit the amount of power used, but switching the lights off whilst not needed, must be the ultimate goal. Behaviour change is the most flexible and cheapest solution to energy management but is often ignored as too effortful to do.

Understanding and promoting this ratio will make organisations not only environmentally sustainable but also reduce their operational and financial risk that the cost, supply and security of energy will pose to companies in the near future.

Energy efficiency is not an end in itself; it is a method of reducing the energy used whilst a system is in use. The most efficient use of energy is not to use it in the first place. This has to be the starting point in achieving energy reduction. Without human intervention there is no energy use and whilst this sounds simplistic the human factor is very often ignored.

Behaviour change is often seen as in the too difficult to do box even though it could be the cheapest and most effective form of energy efficiency. It has been largely ignored in the workplace, whilst the Health and Safety Executive (HSE) is mandatory training for many employees, energy training which could save companies significant amounts of money, is ignored. When was the last time you went on an organisation promoted energy efficiency course?

The EMA runs Low Energy Company (LEC) training, accrediting employees who have taken and completed courses that meet the EMA standards. The aim is not only to make companies aware of the value or indeed the necessity of energy management training, but also to make the energy managers of the future focus on an area they have often avoided in the past.

An organisation that has seen the cost saving potential of training is Wickes, the home improvement retailer. It has become one of the first UK organisations to reap the benefits of training their staff in Stage One Low Energy Company training. After training 146 of their staff mainly including store managers, supervisors and key holders, the national DIY retailer saved over £500K on their energy bill in 2014 across their 230 store estate.

If Wickes have identified and achieved savings through energy awareness training and simple behaviour, why other organisations are so unworldly? The reason

many more organisations have not embraced the energy saving of behaviour change is because it is so difficult to quantify the saving. It is easy to measure the efficiency of say one lighting system against another; however measuring the impact of different employees in a changing workplace is really difficult to value. Another factor is that training often takes place alongside other energy efficiency measures and attributing the savings to one particular measure can be problematic as the achieved savings become diluted.

The real driver for training in the future may not be the sharp hike in peak time prices in 2016/17, nor cost savings but procurement. There is real financial risk in supply companies having to raise prices in line with increases in energy prices. The way to mitigate this risk is to make sure that the supply company is energy efficient and a simple way of proving this is to train staff. It would be ironic if companies are forced to train to meet the demands of their clients while making it a provision of their own supply chain.

There is one way to make training widespread and that is for the Government to make it mandatory. With power cuts at peak times around the corner this might just happen. In a meanwhile, give the 40:20:40 ratio a genuine thought, will you?

Risks ahead for energy intensives

Reform of the EU ETS, energy security and price volatility present a cocktail of risk for major energy users, according to British Ceramics Federation chief executive Laura Cohen

Although wholesale energy prices have been low and relatively stable, Cohen agrees that there is potential for "very high volatility", given geopolitical uncertainty and local concerns around electricity security in the UK.

"The issue is not just a physical gas or electricity interruption but the possibility of a gas or electricity price spike as well – and prolonged spikes at that," she says.

EMISSIONS TRADING RISK

However, Cohen believes the biggest risk facing energy intensive industries is reform of the EU Energy Trading Scheme. While the reforms will affect the scheme post-2020, key decisions on its future will be taken this year. The outcome could have significant cost implications.

> *Even world class energy efficient installations may possibly have to buy all or most of their carbon allowances after 2020.*

The main risk is inadequate carbon leakage protection post-2020. Cohen says that has "very large possible cost increases indeed. Decisions taken this year about the nature of those reforms will have very profound consequences on our members."

Key concerns around tiering of free allocations could mean "even world class energy efficient installations may possibly have to buy all or most of their carbon [allowances] after 2020," says Cohen.

That could be compounded by increasing carbon prices in the longer term, particularly if Europe finds its way back to economic growth, as prioritised by the European Commission.

ENERGY TAXES AND POLICY COST PROTECTION

The government announced late last year that it had State Aid approval to protect energy intensive industries from the cost of climate change policies. But there are doubts over how many companies will actually benefit as the Treasury seeks to limit the cost.

'Arguably, the State Aid guidelines allow the government to protect a much larger pool of companies than currently envisaged: It has set a challenging electro-intensity test.

Cohen would not be drawn on how many member companies might receive protection, nor the government's approach. However, she admitted that many members would be left at a disadvantage compared to European competitors.

"The type of companies that might benefit are those with an electric arc furnace [operating at] 2,750 degrees centigrade – they will get the compensation. And if they don't there is something very wrong with the system," says Cohen.

While the outcome of Treasury's review of energy taxes remains an unknown, most commentators feel that streamlining the taxes, while potentially reducing administration, is unlikely to result in lower taxes.

Cohen says that the two risks are linked. "The headline here is that UK climate related charges remain unmitigated for the bulk of UK industry compared with competitors. And for some, it is the potential increase in Climate Change Levy charges that may result from the business energy taxes review."

DEMAND-SIDE RESPONSE?

While National Grid plans to rapidly scale demand side response, Cohen says many energy intensive industries, particularly her members, are unable to participate.

"While some members might be able to make a demand side response for part of their process, many operate continuous high temperature processes and will not be able to do so."

Even those with batch processes will struggle, she believes.

"If you are running a 12-hour batch process at over 1000 degrees centigrade, you will need to run it. You can't just shut it down half way through," says Cohen. However, she welcomes the push from National Grid: "We need effective measures for others [i.e other industry sectors] to be able make a significant demand side response to ensure that there is the physical security of supply on the system as a whole."

INADEQUATE INNOVATION FUNDING

However, Cohen believes that "significant" technological advancement will be required to achieve the drastic emissions reductions necessary under the Climate Change Act. She outlines a final, more forward-looking issue to consider:

"There is a risk, particularly in a cash constrained government, that there will be inadequate funding for significant radical technology development and implementation," she says.

"Yes we can continue implementing best available technology, which will help. But to get the really radical emissions reductions necessary under the Climate Change Act we are going to need significant step changes in technology."

What would company directors do?

We asked survey respondents for their views on the review of green taxes and how government might decarbonise the economy at lowest cost. Here's what some of them said:

The government is reviewing business energy taxes. What single action could it take to make the biggest improvement to your business' competitiveness?

1. Streamline and separate taxation and energy reporting. They do not need to be linked - one is for raising funds for the treasury and the other is about driving down usage. By doing so businesses would separate the focus too - *director, energy services firm*
2. Retain the CCL exemption for renewable energy – *director, consultancy*
3. Create one single energy tax and make it simple - *purchasing director, large building materials firm*
4. Make them lower and simpler – *water company energy director*
5. Increase balancing payments and implement an energy efficiency feed-in tariff - *energy technology company director*
6. Subsidy for energy conservation measures identified through ESOS – *sustainability manager at large chemical company*
7. Employing a more consistent and long term strategy - *divisional managing director, large property group*
8. Remove Triads - *director, industrial conglomerate*
9. Create financial incentives for battery storage systems – *director, energy consultancy*
10. Nothing. My energy costs are 0.3% of my turnover – *director renewable energy consultancy.*

> *Streamline and separate taxation and energy reporting. They do not need to be linked - one is for raising funds for the treasury and the other is about driving down usage. By doing so businesses would separate the focus too.*
> *Director, energy services firm*

What do you think would make the biggest impact on decarbonising the power generation sector at lowest cost while maintaining system security?

1. Nuclear power plants – *director, industrial conglomerate*
2. Re-instate subsidies for adoption of green energy technology for next three years whilst oil and gas prices are low – *MD, building sustainability audit firm*
3. Long-term incentives for energy efficiency - *divisional managing director, large property group*
4. Smart grids and allowing distribution network operators [local grid operators] to compete with National Grid on level playing field – *director, energy technology company*
5. Auctioning support for onshore wind and solar. Consistent, sensible energy policy – *director, energy consultancy*
6. Battery storage linked to renewable generation – *sustainability manager at large chemical company*
7. Installing more renewables – *director, renewable energy consultancy*
8. Greater investment, more tolerance to renewable generation and driving reductions in energy usage - *director, energy services firm*
9. Providing adequate subsidy for renewable generation and less political interference into the approval of schemes - *water company energy director*
10. A carbon tax on all goods and services – *director, energy services co-operative.*

> *Long-term incentives for energy efficiency.*
> *Divisional managing director, large property group*

Thank you for reading the 2016 Director's Energy Report.

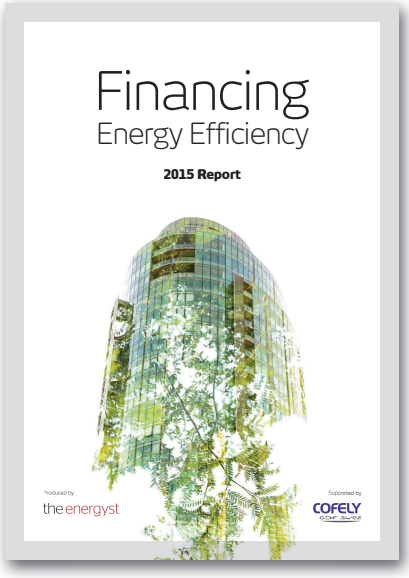
It is 15 years since the UK introduced its climate change programme and attempted to encourage energy efficiency with a view to reducing carbon dioxide emissions. Since then we have had a heady mixture of apathy, ignorance, arrogance and stupidity. From picking winners technologically and backing them with subsidies to taxing carbon numerous times and at different rates to the same consumers. If asked what you think of UK energy policy it seems apt to paraphrase Gandhi's quote about what he thought of British civilisation and say 'I think it would be a good idea'.

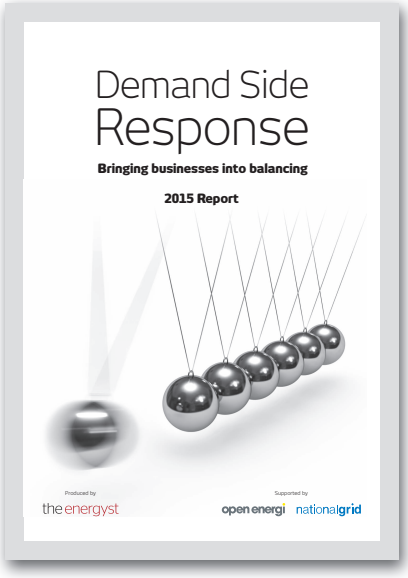
We hope the report highlights how your contemporaries view the state of the market as well as some of the key considerations in the forthcoming year. I would like to thank our supporters BIU and Haven Power without whom this report would not be possible. I would also like to thank the directors and senior managers who took time to answer the survey.

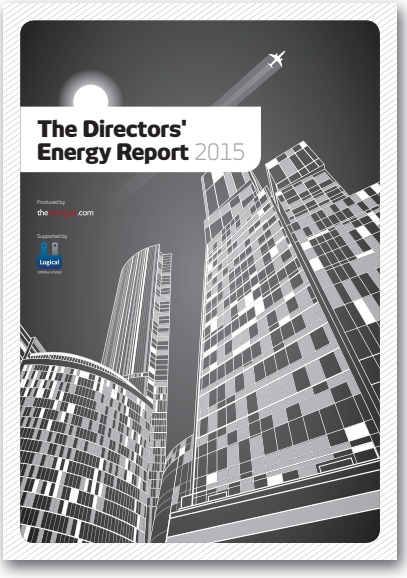
If you would like further information on demand side response take a look at our dedicated Demand Side Response report. Getting energy efficiency projects off the ground can be hard work and many stumble at the financing/payback stage. For a detailed look at finance download The Energyst's Financing Energy Efficiency report. Both of these are available at **theenergyst.com/market-reports**

Our next report is examining attitudes towards heat, an overlooked area of policymaking given that half of the UK's energy is used for heating. Please share your views by visiting **theenergyst.com**

Tim McManan-Smith, editor, The Energyst







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