FUTURE OF **UTILITIES**

The Future of Utilities Report 2019

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Contents

Introduction

There are few sectors untouched by digital technology. Whether it's checking a bank balance, hailing a taxi, booking a holiday or buying groceries, the consumer experience has been completely reshaped by apps, clicks and bots. Across business, the use of artificial intelligence, along with new technologies such as blockchain is transforming many processes. But how is the utilities sector responding to this technology revolution, alongside the many policy and regulatory challenges for an industry in the forefront of carbon reduction? Future of Utilities surveyed over 275 senior executives from the industry in January 2019, including those in water and wastewater, electricity generators, energy suppliers and networks.

In the competitive energy supply market digital technology, including the advent of smart metering, is creating opportunities for new entrants to capture market share. Our survey found a widespread perception that if utilities fail to innovate they will be vulnerable to tech giants with stronger customer relationships. While few believe the smart metering programme will be delivered on time, it will lead to substantial benefits to customers as well as cost savings and reduced risk for suppliers.

Across retail businesses, whether in energy or water, customers are increasingly comparing their experiences with what they have come to expect from tech-savvy service providers in other sectors. But new digital technologies present an opportunity for utilities to transform their businesses and offer an improved service to customers.

Perhaps the greatest changes will be seen in electricity networks, as they find themselves at the core of the low carbon transformation. We found a system on the cusp of dramatic change, but one that risks becoming unfit for purpose unless the pace of changes increases. New technologies also present the opportunity for a step change in the management of both water and energy networks, as the rise of sensors and analytical capabilities enables active asset management.

The industry now has a window of opportunity to reinvent itself. The challenge, however, is accomplishing this digital transformation, while also contending with the realities of increased political control. The pressure to decarbonise and meet environmental targets, while managing and maintaining aging infrastructure, is similarly substantial. The good news is that most of these challenges can be overcome through the timely and thoughtful application of new technologies – and even the political pressures could be alleviated if new technology enables these regulated companies to prove to politicians that they are cost-effectively managing supply, meeting targets and delighting customers.

Our research provides insight into the industry's digital ambitions and a snapshot of its current digital readiness. There is much to be done – but the journey is now underway and gathering speed.

Chapter 1

The Future of Utilities in the Digital Age

The Future of Utilities in the Digital Age

2018 saw the acceleration of a trend that has been developing over several years. The market share of the largest energy suppliers (the so-called Big Six) – British Gas, EDF Energy, E.ON, npower, Scottish Power and SSE – fell to a record low of 76 per cent and profits fell by 10 per cent to £900 million[1], as they ceded 1.4 million customers to new entrants. With a record 5.9 million customers changing their supplier in 2018, it appears the dominance of the Big Six is increasingly under threat.

However, the rise of independent suppliers has not been without its problems. The past year has seen at least 10 UK suppliers go under as their ambitions faced the reality of wholesale price volatility. Others have been hit by regulatory intervention: in February 2019, for example, the regulator Ofgem issued a three-month ban on Solarplicity, preventing the energy supplier from taking on new customers until it addresses its poor customer service and switching process.

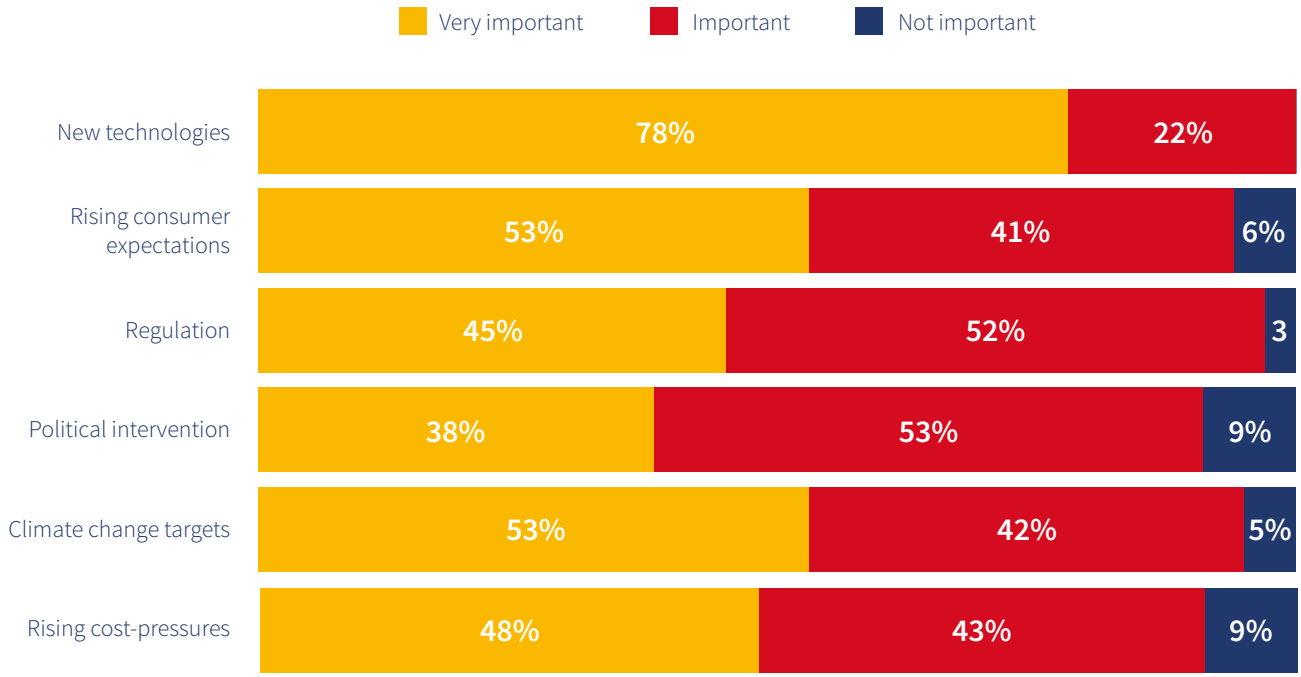
Water companies face their own difficulties, with the industry under increased scrutiny about water leaks from aging infrastructure and ownership and financial structures. This comes at a time when there's a political groundswell in favour of nationalising the water companies. Nationalisation was included in the Labour Party's 2017 manifesto, a pledge that polls suggested had the support of six out of ten voters[2].

78% think new technologies will be the top driver of change in the industry over the next five years

The utilities sector has, therefore, much to command its attention, whether it's fluctuating government policy, fickle customers or the costs of maintaining and renewing infrastructure. In an era of profound disruption, from political turbulence to climate change to the rapid speed of technological change, all companies must flex and innovate if they are to stay relevant in a changing world.

Indeed, it is that very advance of technology that is seen as the top driver of change in the industry over the next 5 years. As technology has made rapid changes in other business areas such as banking and ecommerce, 9 out of 10 of our respondents think the utilities industry has been much slower to adapt and that now needs to change. Almost eight out of ten (78 per cent) believe new technologies will be a very important driver of change in the industry over the next five years, ahead of rising consumer expectations (53 per cent), climate change targets (53 per cent) and rising cost-pressures (48 per cent).

The utilities industry seems to be entering a period of significant change.
How important do you think the following will be in driving change in the industry over the next five years?



[1] *Ofgem, State of the Market Report 2018*
[2] *59% back nationalisation of the water companies YouGov, May 2017*

Our world, but smarter

Technology is reshaping all aspects of our lives: how we shop, communicate, drive, bank and organise our lives. Connected sensors embedded in our devices, homes, cars, even inserted into our bodies, mean companies can now collect more data than ever before, allowing them to make real-time predictions and adaptations in order to make life safer, smarter and more convenient. Sensors on power lines, pipes and in processing plants allow better management and maintenance of assets, while GPS-connected mobile apps allow the smart deployment of engineers to keep the lights on.

Smart meters are expected to lead the digital transformation of the industry over the next five years[3], although the roll-out in energy is currently way off track and over budget, according to the National Audit Office[4]. But these are just one facet of the digital disruption of the retail energy market, as smart thermostats, such as Google's Nest device, go mainstream, giving customers more control over their energy consumption even when they're not home.

97% agree it will be crucial to invest in new technology to meet rising customer expectations

As customers embrace this smarter world, in which intuitive interfaces and intelligent machines smooth out petty inconveniences and make life easier, they will increasingly shun those organisations that fail to eliminate pain points in the customer journey. This new reality is not lost on our respondents, with more than half (53 per cent) identifying rising consumer expectations as a very important driver of change in the industry over the next five years and an overwhelming 97 per cent believing it will be crucial to invest in new technology to meet those expectations.

The innovation gap

It's clear, however, that there's an innovation gap between where the industry is now and where it needs to be to stay relevant in a fast-changing world: 92 per cent believe the UK's major utilities need to become better at innovation if they are to remain the leading players in the industry of the future.

92% believe the UK's major utilities need to become better at innovation if they are to remain the leading players in the industry of the future

This innovation gap could prove telling as new entrants seek to build market share at the expense of incumbents through brand-savvy propositions promising lower tariffs, price transparency and connected home devices. And it's not just digital-first energy suppliers that present a challenge. Big Tech, too, looks set to be a disruptor: Google and Apple both offer smart home devices, while the unexpected penetration of Amazon's appealingly-priced voice-controlled smart speaker looks set to drive sales of additional connected home kit that is Alexa-compatible. This threat should not be underestimated: traditional utilities companies that fail to innovate could find themselves cut out of the customer relationship.

Studies suggest that 82 per cent of utilities companies plan to respond to this threat of disintermediation by investing in their own connected home propositions in the next three years in order to access data and offer new services that will redefine their relationship with the customer "beyond the meter"[5].

This could prove popular, particularly with a new generation of householders. Demographics suggest that by 2020, about 95 per cent of a utilities company's bill-paying customers will have either grown up during the age of digital technology or will be fully digital savvy[6]. These connected customers are likely to be prepared to share data in order to access the frictionless, personal and intuitive experiences they have come to expect from leading tech companies. This is, however, a high bar for a sector that serially underperforms in customer satisfaction surveys, with utilities companies routinely outranked by banks, retailers and insurance companies[7].

[3] *6% of industry executives believe the Government's 2020 smart meter target will be the pivotal driver of change over the next five years, according to research from Capgemini https://www.capgemini.com/gben/2018/07/energy-companies-look-outside-of-the-industry-for-new-revenue-streams/*
[4] *https://www.nao.org.uk/report/rolling-out-smart-meters/*
[5] *Digital Utilities – From Behind the Curve to Innovation, CGI Group, 2017*
[6] *Digital Utilities – From Behind the Curve to Innovation, CGI Group, 2017*
[7] *The Customer Service Institute*

Rehabilitating the industry's public image

There are signs that the industry is waking up to the costs of its poor public image, which not only leads to customer churn but increases the risk of disruption from new entrants and also regulatory and political intervention, including the introduction of retail energy price controls: four out of five (81 per cent) agree that the industry itself has been a significant cause of its own image problems and 92 per cent think it must do more to improve its public image if it is to succeed.

81% agree that the industry itself has been a significant cause of its own image problems

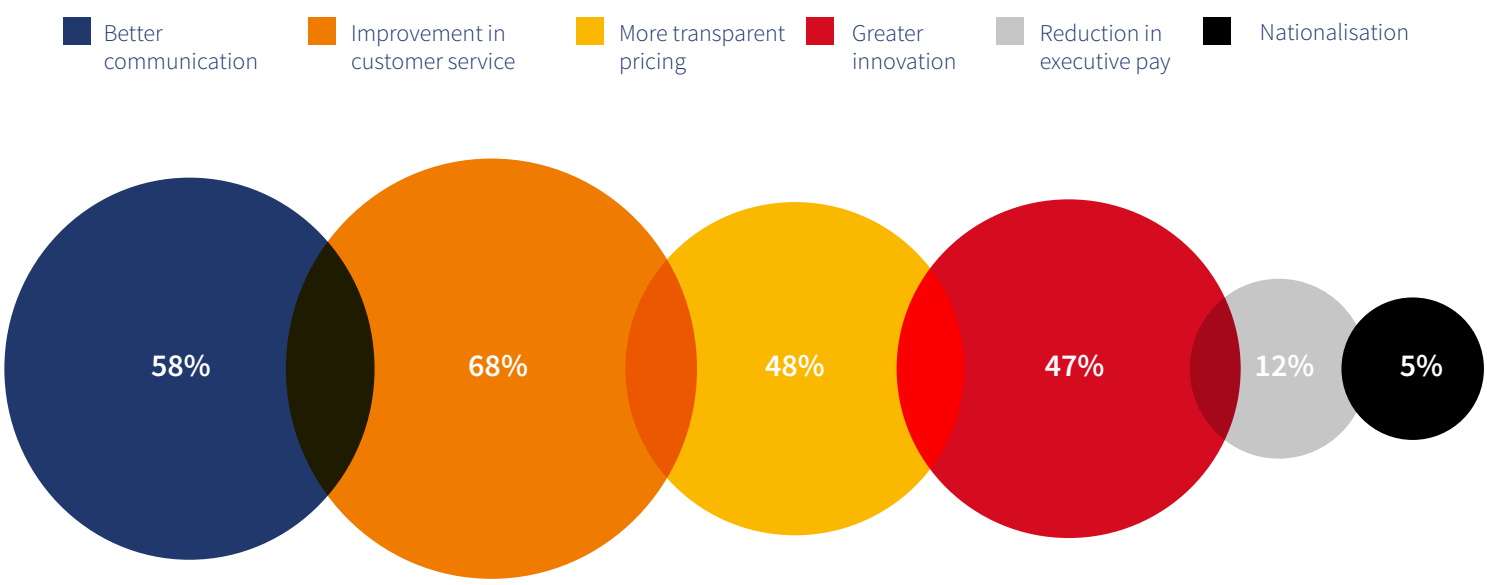
92% think it must do more to improve its public image if it is to succeed

Our findings suggest that it is the nut-and-bolts of providing a good customer experience, rather than price caps or governance, that is best placed to rehabilitate its public image. Given there were almost four million complaints to energy suppliers in 2017[8] - and experts believe almost half of the industry's dissatisfied customers don't even bother to complain because they don't think it will make any difference[9] – this is certainly an area where there's plenty of scope to deliver material gains in public approval.

More than two-thirds (68 per cent) of our respondents believe improvements in customer service will be very important to improving the image of the utilities industry, followed by better communication (backed by 58 per cent of respondents).

By contrast, 43 per cent of respondents think reduced executive pay would have no impact at all on the industry's public image, while three-quarters think the same of nationalisation.

Percentage of respondents who said the following would be very important in improving the image of the industry



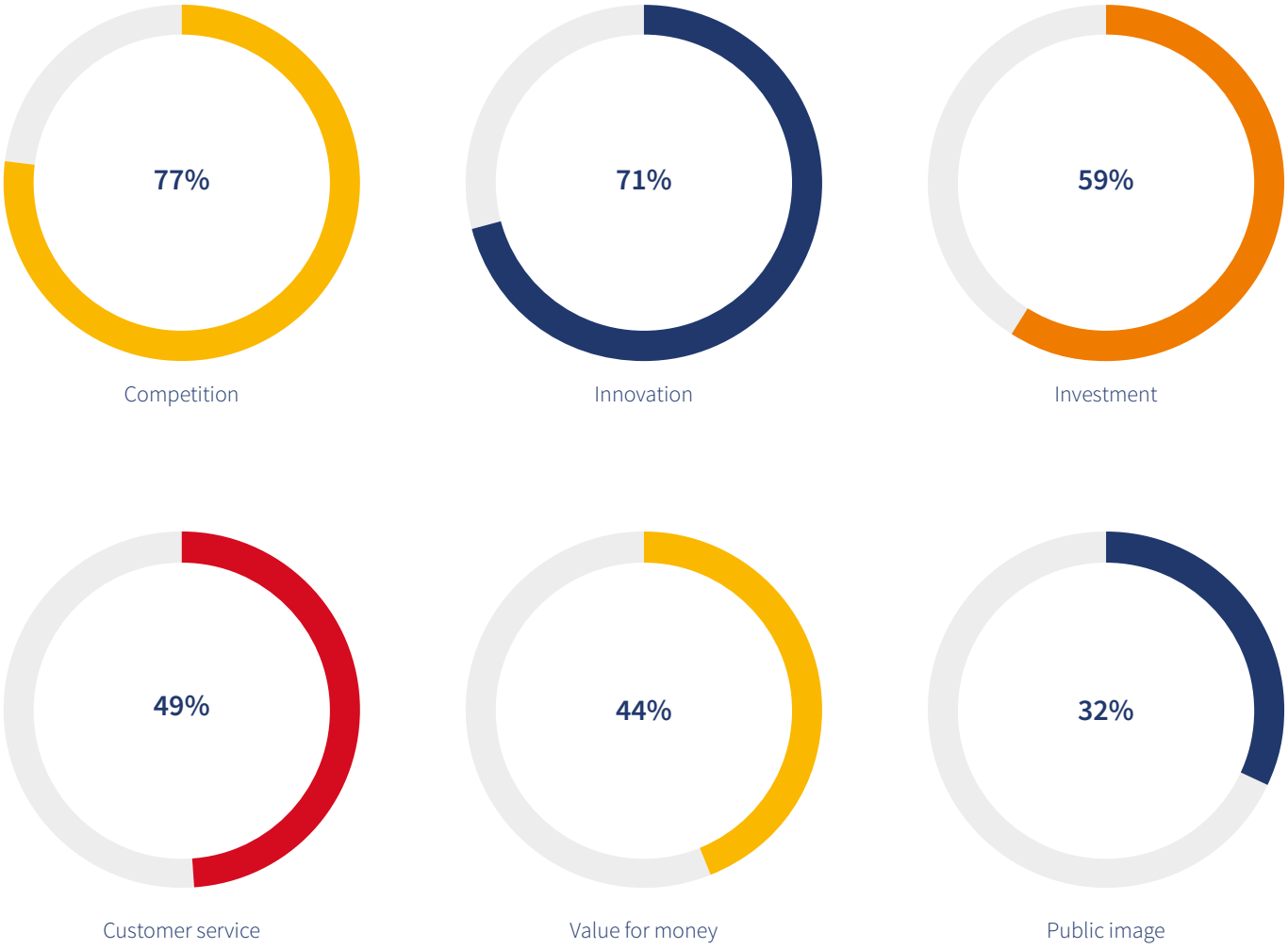
[8] *Ofgem, February 2019*
[9] *Jo Causon, CEO of The Customer Service Institute*

32% think the industry must do more to improve its public image if it is to succeed

However, a third of our respondents (32 per cent) agree that if public perception of utilities does not improve, the Government would have a strong argument for renationalising the industry, a policy which opinion polls suggest a majority of the British public would back[10].

Despite this, our respondents overwhelmingly believe that nationalisation would be bad for both the industry and its customers. Large numbers of our respondents predict that competition (77 per cent), innovation (71 per cent), investment (59 per cent), customer service (49 per cent) and value for money (44 per cent) would be made worse were such a policy to be introduced.

Percentage of respondents who think nationalisation would make the following worse:



[10]*Numbers vary widely from about 53% in a YouGov Poll of 2017 to as high as 83% support for nationalisation in a Legatum Institute survey https://www.li.com/activities/publications/public-opinion-in-the-post-brexit-eraeconomic-attitudes-in-modern-britain*

And it is not just nationalisation that worries those in the sector. The present Government has already shown an appetite for further intervention in this regulated industry and further measures could limit earnings and thus investment. While our respondents overwhelmingly believe that adopting new technology is the key to the industry's future success, three quarters of them (74 per cent) believe that greater political control risks leaving the utilities industry behind in the next stages of technology change.

Given the rapid pace of change in the world and customers' increased appetite for innovation and superior experiences, this could be a risk too far. More than seven out of ten respondents (71 per cent) think the utilities industry of 2030 will be unrecognisable from the industry we see today. Those companies that fail to innovate today may find they are no longer part of this brave new world.

74% **agree that greater political control would put the utilities industry at risk of being left behind in the next stages of technology change**

71% **think the utilities industry of 2030 will be unrecognisable from the industry we see today**

Chapter 2

Disruption and Innovation in the Utilities Retail Market

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Disruption and Innovation in the Utilities Retail Market

Daily life has been transformed by a digital revolution. From one-click shopping to mobile banking, from the ubiquitous Facebook log-in to the taxi that arrives at the swipe of a smartphone, our lives are convenient, immediate and at our fingertips, 24/7. It's a revolution that has transformed entire industries, unravelling long-established business models and generating entirely new billion-dollar enterprises in a few short years.

Companies like Amazon, Uber and Netflix deploy advanced analytics, data-driven insights and personalised, user-friendly interfaces to create compelling customer experiences that are individual, smart and add value to daily life. Customers can't get enough and admit that these digital pioneers have whetted their appetite for ever-higher service standards: one survey found 88 per cent of consumers expect their experience with the companies they use to keep getting better in the future and 83 per cent think best-in-class experiences raises their expectations for all companies[11].

This is a clear challenge for the utilities sector. To date, a customer's interactions with their utilities supplier remains largely analogue: a bill arrives in the post, the customer grudgingly pays it and will only engage further if there's a supply outage or other service issue. It's a model that looks increasingly out-of-date in a world where other service providers, from insurance companies to banks, seek to engage customers by offering value-added personalised services.

Little wonder then that more than seven out of ten (72 per cent) of our surveyed executives agree that utilities is well behind other industries when it comes to adapting to new technology. What's more, they worry that customers have noticed this capability lag: 94 per cent think that customers increasingly compare the experience they receive from their utilities companies with that from tech-savvy service providers in other sectors. While this represents an enormous challenge, nevertheless almost all our respondents (97 per cent) believe that new digital technologies present an opportunity for utilities to transform their businesses and offer an improved service to customers.

72% agree that utilities are well behind other industries when it comes to adapting to new technology

94% think that customers increasingly compare the experience they receive from their utilities companies with that from tech-savvy service providers in other sectors

Closing the customer experience gap

The three key factors our respondents have cited as driving the improvements of customer service in utilities to a significant extent are rising customer expectations (82 per cent), new technology developments (79 per cent) and the influx of data (73 per cent). Respondents in the water industry also see concern over reputation (80 per cent) as a major driver.

The good news is that the technologies that have opened up this customer experience gap can now be harnessed to close it. Most of our respondents agree that new digital technologies will transform their operations, with 86 per cent forecasting a great or significant impact on customer service improvements and 88 per cent expecting the same for operational cost reductions. Those from the water industry also believe overwhelmingly (90 per cent) that they have the potential to improve the industry's image and reputation.

Percentage of respondents who expect digital transformation to have a significant impact in the following areas

Improving customer service
86%

Reducing operational costs
88%

Making customer acquisition or on-boarding easier
75%

Improving image and reputation
58%

[11]*Assurant, May 2018 https://www.assurant.com/newsroom-detail/Features/2018/May/the-rise-of-consumer-expectations-(infographic)*

Given that service levels already lag in other sectors and profit margins at some major utilities companies are under pressure[12], there's a clear incentive to harness the transformative powers of new digital technologies. Worryingly, however, some fear it may already be too late to close the customer experience gap: over a third (34 per cent) of our respondents think the industry will be unable to execute the level of digital transformation necessary over the next five years, a weakness that digital frontrunners may be able to exploit[13].

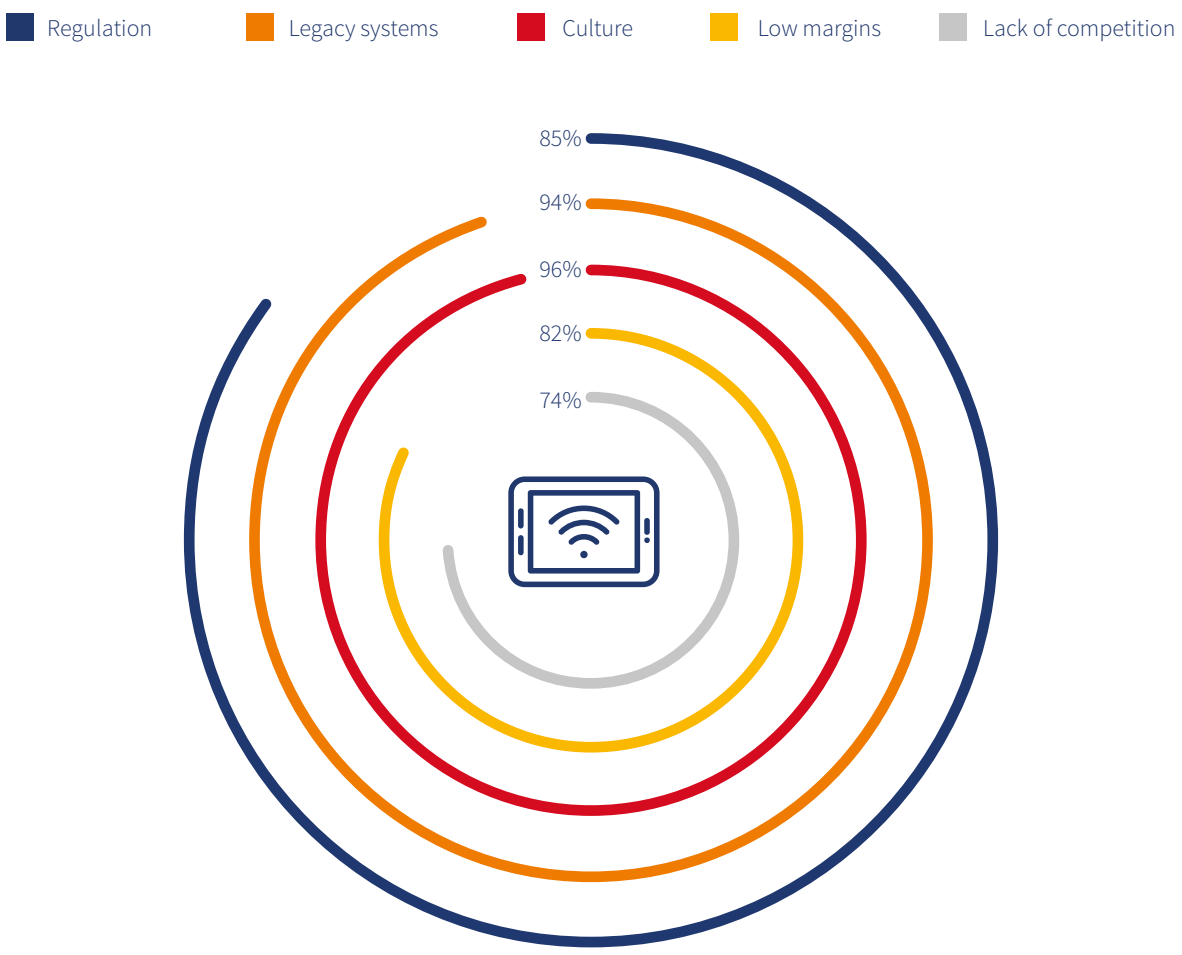
34% think the industry will be unable to execute the level of digital transformation necessary over the next five years

Roadblocks to reform

As with other industries that have been forced to innovate rapidly in order to stay relevant in the digital age, the utilities sector is struggling to change quickly enough. Many retailers and banks, facing fierce competition from new entrants, whether it's the vast reach of Amazon or the smart solutions of FinTech innovators, have successfully deployed new technologies to transform the customer experience. By contrast, the utilities sector is still at the beginning of its digitisation journey.

Our research finds a number of issues acting as barriers. Culture is cited as the top roadblock to innovation and new technology adoption, identified by 96 per cent of our respondents, closely followed by legacy systems, cited by 94 per cent, and regulation, at 85 per cent.

Percentage who think the following factors are important inhibitors to innovation and the adoption of new technology in utilities



[12]Ofgem figures for 2017 show that British Gas may have maintained a healthy margin of 8% and SSE of 7% but E.ON was down to 5% and ScottishPower's margin fell to 0.5%.
[13]According to McKinsey research, the opportunity for incumbents to get ahead of the pack on digitisation can be narrow: by the time industries near the 40% digitisation mark, digital leaders have already secured large market shares.

Working round the legacy

Legacy systems are, of course, a major challenge for all incumbent players, regardless of sector. Vast companies that have grown through merger and acquisition, patching together different systems and now-dated large-scale software solutions, find themselves struggling to match the agility and customer-focus of digital-first upstarts.

This is not unique to the utilities industry: the banking industry is replete with examples of incumbents struggling to break free of toxic legacy systems. Utilities companies should learn from the experiences of different industries and modernise their IT architectures progressively rather than in one big bang. Simple steps can yield material results: one European utility had a portfolio of thousands of products and services, ranging from traditional energy products with different rate structures to new offerings for energy efficiency and distributed generation, each placing a strain on the IT architecture. By deciding to retain only those products that could be supported by one of four variants of standard back-office processes, the company stripped back its portfolio to 150 offerings that still met 95 per cent of its customers' needs and made it easier to update and modernise its architecture[14].

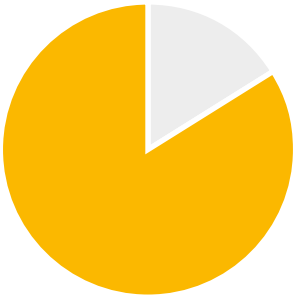
A change of mindset

Changing a corporate culture is a huge undertaking. It takes courage to step outside the comfort box and do things differently. Fostering innovation is not just a question of making funds available for new technology; it's about carving out time for people to think about how to approach old problems in new ways, it's obsessing about customers rather than processes and it's changing mindsets so that an organisation's appetite for risk and its attitude to failure are centred on learning and development rather than blame and control.

Only 24% think most companies currently have the right culture and people to be innovative

An innovation-friendly culture will be essential for companies to thrive in today's connected world yet, worryingly, our survey finds the utilities industry is poorly equipped to make this change: fewer than one in four (24 per cent) of our respondents believe most companies currently have the right culture and people to be innovative.

Regulatory roadblocks



84% think regulation inhibits innovation and 72% don't believe the current regulatory framework provides strong incentives for innovation

Culture is, of course, influenced by the regulated nature of the utilities sector. According to one study, highly regulated industries, like power and utilities, place far less importance on innovation compared to other sectors and, when they do innovate, it is with a view to reducing costs rather than improving customer-service or driving growth[15]. Certainly, our findings suggest that regulation acts as a drag on innovation: 84 per cent of our respondents believe regulation inhibits innovation, three-quarters (74 per cent) cite a lack of competition as a roadblock. Furthermore, despite a range of regulatory pushes to introduce competition and stimulate innovation, more than seven out of ten (72 per cent) don't believe the current regulatory framework provides strong incentives for innovation.

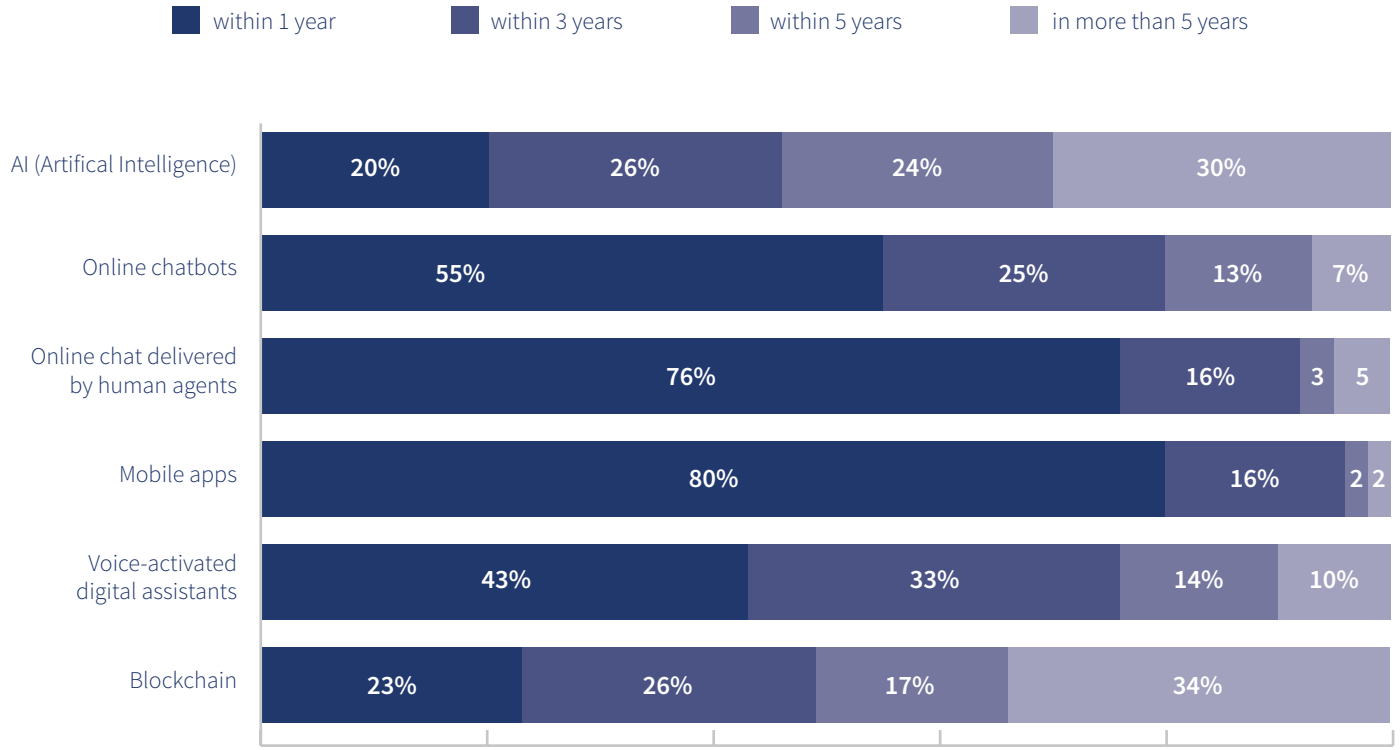
[14]*Case study cited by McKinsey https://www.mckinsey.com/~/media/McKinsey/Industries/Electric%20Power%20and%20Natural%20Gas/Our%20Insights/The%20Digital%20Utility/The%20Digital%20Utility.ashx*

[15]*A report from EY, Innovation: from ideation to activation, found that in highly regulated industries like power and utilities, the proportion of respondents who said innovation was very important was 37% lower than the other sectors' average and that power and utility organizations innovate with a focus on cost reduction (41.6%).*

A slow start, but making rapid progress

Change is afoot, however. Increased competition from new entrants and the appetite of consumers to switch in favour of a better deal means digital transformation is, at last, now underway across the sector. Roughly four out of five of our respondents expect mobile apps (80 per cent) and online chat delivered by humans (77 per cent) to be widely adopted across the industry within the next 12 months. And, over a longer timeframe, the customer interface will be completely reshaped by digital technologies as chatbots and voice-activated digital assistants go mainstream within the next five years. Underpinning these new customer channels will be artificial intelligence (AI), which 70 per cent of our respondents think will be widely adopted within five years. Those in the energy industry appear to be most focussed on the potential of AI and online chatbots in the short term, whereas in the water industry the use of mobile apps is expected to become almost universal.

In what timescale do you think that the following will be widely adopted in the utilities retail market?



And this is why: 86 per cent of our respondents believe that in ten years' time, those utilities that fail to match the level of personalisation and convenience that customers receive from Amazon, Google and Netflix will find it extremely difficult to satisfy customer demands. With 83 per cent of our respondents believing that agile new entrants are better suited to undertaking the digital revolution, incumbent utilities face a steep learning curve over the next decade.

86% believe that in ten years' time, those utilities that fail to match the level of personalisation and convenience that customers receive from Amazon, Google and Netflix will find it extremely difficult to satisfy customer demands

Chapter viewpoint: Localz

By Ashley Brooks, Sales Director Utilities & Field Services

Consumer expectations, in an increasingly time-poor society, have created the Individual Economy, or 'IConomy'. Customers know what they want, where and when they want it. The likes of Uber, Amazon and Deliveroo have transformed consumer communication expectations. Transparency and two-way communications on our smartphones are now a standard expectation. Consumers are conditioned to expect real-time, relevant information that relates to their appointment direct to their mobile. They want a superior service from all providers, whether that is in retail or the utilities sector.

This research validates the pressure on utilities companies to digitise and create better customer experiences. The introduction of smart meters and price comparison, switching advisors, like uSwitch, means consumers only need their postcode and a recent energy bill, to switch gas and electricity supplier at their fancy. The utilities market now has to work to improve their customer experience to keep customers and meet the regulator's demands. The prediction that within 5 years 98 per cent of utilities companies will have apps, will raise the consumer's expectation for real-time updates and transparent two-way communication with their engineer. The utilities sector is set to see a dramatic change in both customer communications and pressure to increase overall efficiencies.

Consumers want service appointments to cause as little disruption to their day as possible. They want to know when exactly the engineer is due to arrive, how long they are going to take and what the next steps will be following the appointment. British Gas has developed its customer experience platform and is seeing drastic improvements to its first-time access rates. Its "on my way" communication advises customers of their engineer's live ETA, enabling them to track their approach on a real-time map and interact directly with their engineer. British Gas has seen no-access, failed appointments fall by 17 per cent. Sending reminder notifications to customers not only helps reduce incoming calls to contact centres, but also enables customers to get on with their day.

Chapter 3

The Energy Supply Market of the Future

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The Energy Supply Market of the Future

The utilities industry is ripe for disruption. Digital technologies provide an opportunity to reframe the relationship with the customer, transforming the customer experience and enabling utilities to offer value-added services. It is not just the customer interface that is set for change, however. As we have seen in other industries affected by digital disruption, entire value chains can be swept away and entirely new enterprises emerge in their place, changing the landscape for ever.

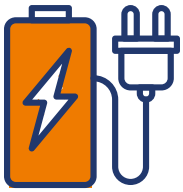
93% expect the rise of new technology to lead to significant changes in the structure of the energy supply market over the next five years

Our findings show the utilities industry is only too aware of the coming upheaval, with 93 per cent of our respondents expecting the rise of new technology to lead to significant changes in the structure of the energy supply market over the next five years.

One of the key features of this restructuring will be ever more competition. Policymakers have been keen to encourage new entrants, offering companies with fewer than 250,000 customers exemptions from certain environmental and social costs. At the time of Ofgem's most recent State of the Market Report in June 2018, there were 73 active licensed suppliers, 13 more than in 2017 and 49 more than 2014. This proliferation of choice eroded the market share of the Big Six, with a quarter of all customers now supplied by small and medium-sized suppliers.

The last year, however, has seen a number of new suppliers run into financial difficulties and cease trading. In November 2018, Ofgem proposed the introduction of financial and customer service tests for new suppliers to demonstrate they have adequate financial resources and can meet their customer service obligations. Applicants for new supply licences will have to demonstrate to Ofgem that they will have the funds and resources to manage their business for at least 12 months after entering the market and must provide the regulator with a plan to meet their customer service obligations. Ofgem is also consulting on tightening its test of whether applicants are 'fit and proper' to be granted a licence and on whether to introduce new reporting requirements for suppliers who are already active in the market, including reports on the adequacy of their financial and operational resources for running their business, serving their customer base and meeting their financial obligations under the Renewables Obligation Scheme.

The rise and rise of new entrants



78% think energy supply will continue to see an influx of new entrants over the next five years

81% expect small and medium-sized suppliers will continue to take market share from the biggest suppliers

Tighter regulatory scrutiny of their financial resilience and operational standards is not expected to deter the influx of new entrants, however. And these newcomers are expected to enjoy success, with eight out of ten (81 per cent) of our surveyed executives predicting that small and medium-sized suppliers will continue to take market share from the biggest suppliers.

Incumbents are not expected to take this incursion lying down, with 83 per cent of our respondents expecting to see consolidation in the market as suppliers seek to protect their margins and market share.

Indeed, this trend has already been underway, although with mixed degrees of success. In December 2018, SSE and npower scrapped plans to merge their retail energy businesses to create the UK's second biggest energy supplier, citing "very challenging market conditions" in the wake of the government's new price cap. SSE, which is now assessing options for its SSE Energy Services business, including a standalone demerger and listing, a sale, or alternative transaction, also cited the performance of the two businesses and changing market conditions for calling off the tie-up.

It is not the only major player mulling a retreat from the British energy market. Media reports suggest that French energy giant EDF may seek to spin-off of its energy-supply business in a merger with a fast-growing start-up. Following its aborted merger with the SSE retail business, npower has revealed plans to shed 900 jobs, about 14 per cent of its workforce, as it seeks to reduce operating costs in response to "extremely tough UK retail energy market conditions" as a result of the price cap.

In December 2017, Shell bought First Utility, one of the largest independent UK suppliers, serving around 825,000 homes in the UK. The deal gives the oil giant a foothold in the retail energy market as it seeks to expand into an emerging new electricity value chain in the UK, whereby customers manage their electricity usage and sell some power back to the grid. The oil giant has also acquired NewMotion, one of Europe's largest vehicle-charging providers.

There has been further consolidation among the fragmented small-to-medium end of the market, which has been hardest hit by tough market conditions. In May 2018, Co-op Energy completed its swoop on ailing Flow Energy, which accepted a bargain basement £9.25 million for its cash-strapped business. Analysts predict there will be further consolidation as new entrants continue to struggle in the current market[16].

New opportunities to focus on value, not price

The financials may be tight now but the industry clearly sees opportunities ahead as the roll out of smart metering enables new technologies to create an escape from the vicious price wars of the last decade: 92 per cent of our respondents believe technology developments offer an opportunity to compete on service rather than just on price. Just as in banking and insurance, where incumbents found themselves locked into price-driven competition driving margins ever lower and with little differentiation to consumers, new digital technologies are creating opportunities to compete on value-added services for which customers are prepared to pay. Insurers, for example, use advanced analytics to deliver personalised insurance products that reflect a customer's changing risk profile in real-time or use smartphone apps and AI-powered virtual assistants to reduce claims cycles from weeks to mere seconds.

92% believe technology developments offer an opportunity to compete on service rather than just on price

65% agree smart metering will further reduce the advantages of vertical integration, leading to more new entrants, including small suppliers and large technology firms

95% think the major suppliers need to step up their game if they are to remain dominant

These types of digitally-smart solutions add real value to customers yet do not require decades of incumbent experience to deploy. This is what makes digitisation such a powerful force of change; the playing field is levelled between incumbent and upstart.

Following the replacement of the Electricity Pool in England and Wales by the New Electricity Trading Arrangements in 2001, vertical integration of generation was seen as a major advantage leading to the creation of what came to be known as the 'Big Six'. Our findings show that the utilities industry is now bracing for a levelling of the playing field: seven out of ten of our respondents believe that as smart metering makes it easier to match retail prices to wholesale ones, the role of the energy supplier will be fundamentally transformed. And two-thirds (65 per cent) believe that as smart metering further reduces the advantages of vertical integration, there will be more new entrants, including small suppliers and large technology firms. It seems the dominance of a small number of major firms is no longer guaranteed. Indeed 95 per cent of our respondents say the major suppliers need to step up their game if they are to remain dominant.

The industry clearly believes that there will be a rebalancing of the electricity supply business over the next decade. While almost all think that the traditional incumbents will retain a significant role, they also predict significant penetration by suppliers with a technology-based proposition, suppliers with a sustainability-based proposition and tech giants, such as Google or Amazon.

[16]*https://www.ft.com/content/751df300-96f8-11e8-b67b-b8205561c3fe*

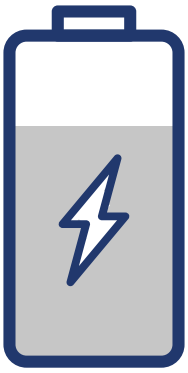
Percentage who think the following will have a significant role in the energy supply market in 10 years' time

Traditional incumbents (e.g. SSE or British Gas)
94%

Suppliers with a technology-Based proposition (e.g Pure planet or OVO energy)
93%

Suppliers with a sustainability-based proposition (e.g Good Energy or Bulb)
88%

Tech Giants (e.g Google or Amazon)
82%



Auto-switching companies (e.g Flipper or Labrador)
73%

The GAFA effect

84% agree that, if utilities fail to innovate, tech giants with stronger customer relationships may become a more natural choice for the supply of energy

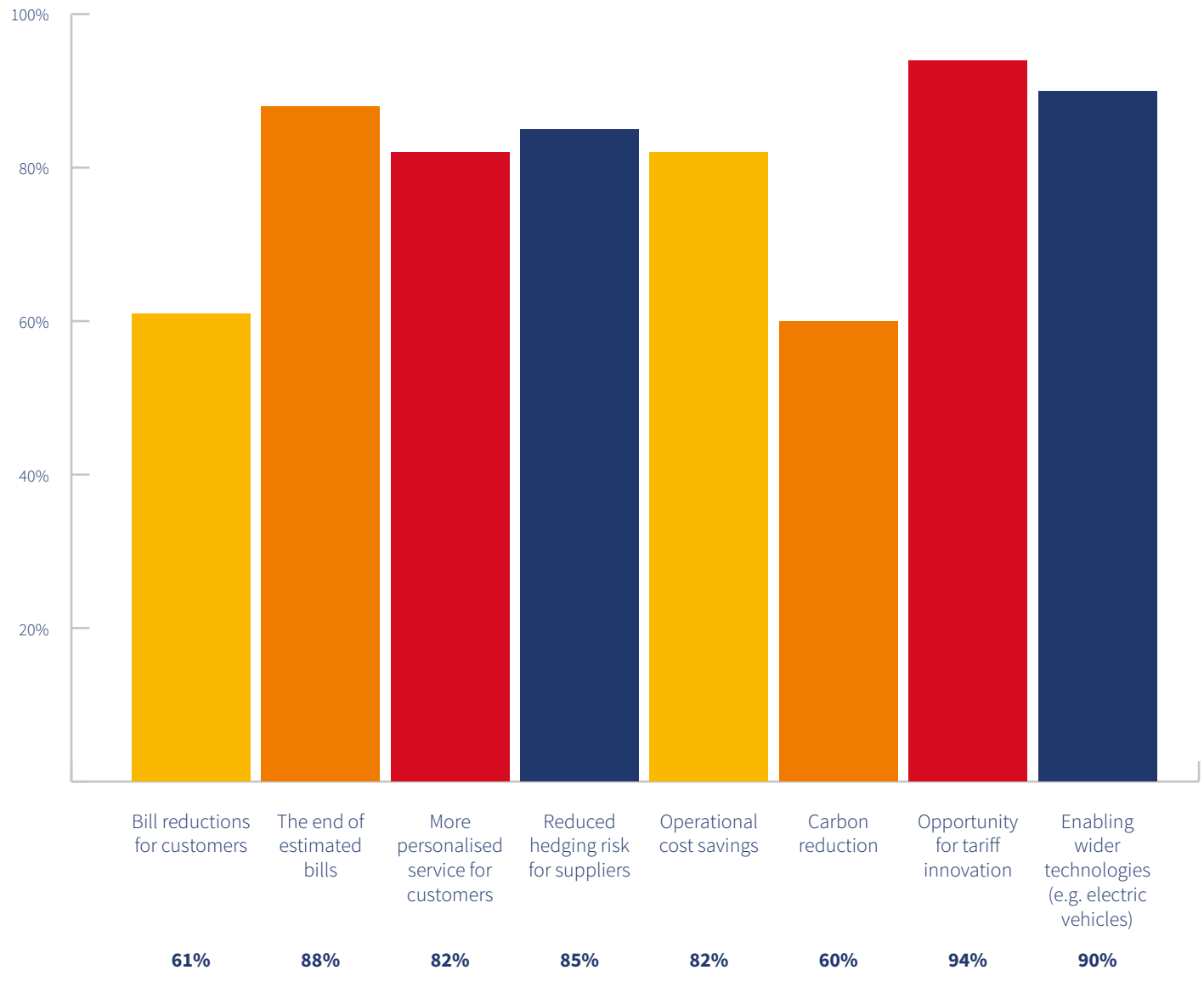
Indeed, it seems there is no industry, no matter how big, no matter how entrenched its position, no matter its ownership of physical infrastructure, that is beyond the reach of Big Tech. Google and Apple already offer smart home kit that gives them access to real-time consumer usage of utilities plus a host of rich behavioural data that allows them to predict, anticipate and deliver seamless and personalised services to meet the needs of the individual householder. Big Tech already has a compelling brand appeal among billions of users so it is little surprise that more than four fifths (84 per cent) of our surveyed executives think tech giants could become a more natural choice of energy supplier than utilities that fail to innovate. Given how effectively GAFA has disrupted other industries, this is a threat that should not be underestimated.

Smart meters: the key enabler

Many of these market changes are dependent on smart meters, the installation of which has been the Government's central policy to reduce household energy consumption for over a decade. The programme has not been without its controversies, however, with repeated delays to the approval of meter specifications and the development of the national IT infrastructure. The Government has long cited a reduction in energy usage (and consequently carbon emissions) as the principal benefits of the programme, and the campaign of Smart Energy GB, the body charged with persuading the public of the merits of smart meters, has until recently focussed almost solely on cost savings. Our survey finds, however, that the industry is more sceptical. A small majority (56 per cent) anticipate the scheme will yield significant benefits in regards to lower bills (although 88 per cent do think it will end estimated bills, which are a huge source of anxiety and uncertainty for many customers) and not many more, 59 per cent, think it will have a significant impact on carbon emissions.

In fact, our respondents think that the major benefits lie elsewhere. 94 per cent expect smart meters to offer significant benefits when it comes to tariff innovation and 90 per cent expect them to be a gateway to wider transition technologies, such as electric vehicles. They also believe that the programme will yield major benefits for the industry itself, enabling operational cost savings and reducing hedging risk for suppliers.

Percentage of respondants who think the following will be a significant benefit of smart meters



These benefits are at risk, however, from the slow progress to date. Almost three quarters of respondents (71 per cent) say it is unlikely that the industry will meet the 2020 deadline, with a third (32 per cent) thinking it is highly unlikely to be met. Industry watchers say the industry was doomed from the start to miss this deadline because the rate of smart meter installations has never been high enough to make it a realistic target[18]. It's an analysis backed by our findings: 69 per cent think that the current deadline risks jeopardising the benefits customers will receive because, with the vast majority of meters having to be installed in less than two years, it will inflate costs and reduce rollout quality. It's a view supported by Citizens Advice, which has been lobbying for an extension to the deadline to 2023 so that suppliers can roll out the remaining meters at a pace that delivers the best possible consumer experience and doesn't risk undermining their faith in this important technology.

This would also give suppliers time to ready their systems and processes for the influx of data expected to flow from smart meters. Just one in four of our surveyed executives think the majority of energy suppliers are ready to handle the large volumes of data generated by smart meters, rendering much of the transformative potential of the technology, from tariff innovation to better customer experiences, nul and void.

The price cap: an intervention too far?

From January 2019, Ofgem has introduced, under Government direction, a supposedly temporary price cap on default energy tariffs. Our survey audience is decidedly sceptical as to the logic of this move. 44 per cent do not think it is justified by any lack of competition in the market, while just over half (51 per cent) think it will fail to deliver a sustained price reduction for consumers. 61 per cent think it will actually make the market less attractive and thereby reduce competition.

Furthermore, our surveyed executives believe the price cap will hinder the switching the Government has been so keen to promote. More than eight out of ten (84 per cent) predict it will punish the engaged consumer for the sake of the inert by increasing prices for those who are on better deals not covered by the price cap as suppliers seek to protect their overall margin. And while the price cap was introduced as a temporary measure, 93 per cent of our respondents agree that removing it may prove politically challenging. As always with forecasting the future for the UK's energy sector, the political context is the wildcard in the pack.

71% **think it is unlikely the industry will meet the 2020 smart metering implementation programme deadline…**

32% **think it is highly unlikely**

69% **agree that the current deadline risks jeopardising the benefits customers will receive because it will inflate costs and reduce rollout quality**

Only 25% believe the majority of energy suppliers are ready to handle the large volumes of data generated by smart meters

93% **agree that although the price cap is planned to be temporary, removing it may be politically challenging**

[18]*https://www.cornwall-insight.com/publications/chart-of-the-week/chart-of-the-week/2018/borrowed-time-calls-for-smart-meter-roll-out-extension*

Chapter viewpoint: Publicis Sapient

By Simon Harvey, Digital Utilities Leader EMEA

As digital technology continues to blur industry lines, all companies are judged against the same high customer experience bar. In an undifferentiated market with increasing levels of churn, generating value for customers through exceptional experiences is what counts. The brand is the experience and the experience is the brand.

For customers this means experiences that are as immediate, intuitive and innovative as the best of big tech, making life easier, safer and smarter. Whether that's utilities providers tapping the data flows from smart meters and connected home kit to deliver personalised services that save customers money (and time) or providing alerts when usage anomalies suggest an elderly relative might need assistance, the future is not about keeping the lights on – it's about going beyond the meter to enrich daily life.

This is the era of the utility as a connected home services provider, using real-time highly granular data from connected devices to feed into advanced algorithms that can anticipate customer needs and configure propositions that are personal, meaningful and compelling – and for which householders will pay a premium. This is the high margin end of the value chain and it's inevitably attracting the attention of Big Tech and other digitally-savvy brand-obsessed new entrants, which will use their superior data and analytics capabilities to offer auto-switching and data-driven services to capture market share.

Utilities companies need to reinvent themselves, to see themselves as software engineering companies obsessed with the customer experience – or risk being disintermediated from the customer relationship altogether and instead staying behind the meter as a low-margin high-volume black box provider.

Utilities now face a choice about which type of company they want to be – and with digital transformation already underway, the time to choose is now.

publicis sapient

Publicis Sapient is a digital transformation partner helping established organizations get to their future, digitally-enabled state, both in the way they work and the way they serve their customers. As digital pioneers with 20,000 people and 53 offices around the globe, our experience spanning technology, data sciences, consulting and customer obsession – combined with our culture of curiosity and relentlessness – enables us to accelerate our clients' businesses through designing the products and services their customers truly value.

For more information, visit publicissapient.com

Chapter 4

The Electricity Network of the Future

The Electricity Network of the Future

Headlines about climate change make for gloomy reading: many analysts now agree there is "almost zero chance" of limiting warming to below two degrees, seen as the threshold for a climate-safe planet, as nations around the world fail to decarbonise their economies quickly enough[19]. The UK leads the G20 in its efforts to decarbonise as coal-fired power generation is replaced with increased renewables capacity: last year, carbon dioxide emissions in the UK fell for the sixth consecutive year and were the lowest on record since 1888, apart from years affected by major industrial action by workers in 1893 and 1926[20].

The UK can't afford to be complacent however, if it is to meet its legally binding obligations under the 2008 Climate Change Act. With the UK's nuclear investment programme in chaos after new plants in Anglesey, Cumbria and Gloucestershire were shelved, renewables will increasingly have to bear the burden of keeping the lights on.

The roll-out of new renewable capacity has placed a strain on the UK's network, which was built to distribute electricity from power stations sited at centrally-located coal fields. Today, with coal accounting for just five per cent of the UK's generation capacity, the network needs to accommodate generating assets that are not only increasingly geographically dispersed across the country but which also generate on an intermittent basis. The disruption doesn't end there: distributed generation, where householders and businesses generate their own power, means electricity networks need to redefine their business models to deliver two-way flows of electricity as self-generators seek to sell excess power into the grid.

Furthermore, the push to decarbonise the transport and heating sectors by switching to electric vehicles and the electrification of heat means these profound structural, commercial and technological changes are hitting just as demand on the networks is set to soar. With some estimates projecting electricity peak demand to surge by more than a third to hit 85 GW by 2050[21], the electricity networks will need to deploy the latest smart technologies in order to create more grid capacity and keep pace with our transition to a low-carbon economy.

90% think the electricity system is on the cusp of a dramatic change

92% expect the rise of intermittent and decentralised generation to meet carbon reduction targets will fundamentally change the way the network is used

Little wonder, nine out of ten of our respondents believe the electricity system is on the cusp of a dramatic change, with 92 per cent expecting the rise of intermittent and decentralised generation to fundamentally change the way the network is used. Consultation and planning are already underway to deliver a future-fit system. In 2017, the electricity networks drew up plans – the Open Networks Project - to deliver a smarter, more flexible and more decentralised energy system, a change which could save consumers as much as £40 billion by 2050[22] and in December 2018 Britain's six Distribution Network Operators (DNOs)[23] pledged that all new "relevant projects" of "significant value" will have smart flexibility built-in from the start, which means that services such as on-site generation, demand-side response and energy efficiency measures will become a pre-requisite for project investment. Research from the National Infrastructure Commission (NIC) reckons these technologies, if installed at scale, would reduce the cost of new energy infrastructure by £8 billion annually by 2030[24].

88% agree that if the electricity system fails to adapt, it will not be fit-for-purpose in 2030

86% think the speed at which electricity networks are adapting is currently too slow

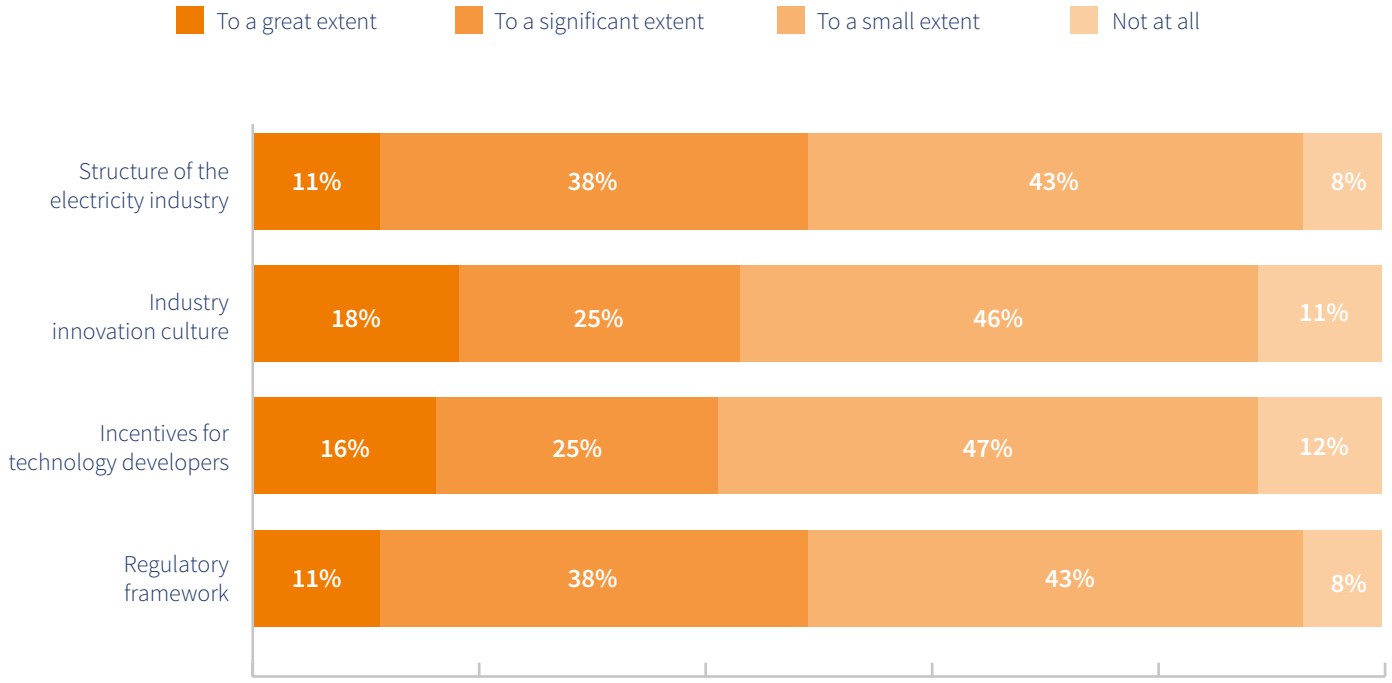
[19] *The Low Carbon Economy Index 2018, PwC*
[20] *Carbon Brief, March 2019*
[21] *Future Energy Scenarios, National Grid, 2017 suggests demand could be as high as 85 GW in 2050, up from 60 GW in 2017*
[22] *Energy Networks Association, August 2018*
[23] *http://www.energynetworks.org/assets/files/ENA%20Flex%20Committment.pdf*
[24] *https://www.gov.uk/government/news/a-smart-power-revolution-could-save-consumers-8-billion-a-year-adonis*

Despite these efforts, our survey finds the industry is concerned about its capacity to change quickly enough to meet the challenges ahead: 88 per cent agree that if the electricity system fails to adapt, it will not be fit-for-purpose in 2030 and 86 per cent think the speed at which electricity networks are adapting is too slow.

There are a number of factors inhibiting rapid change, not least the monopoly structure of the industry, which limits competition and innovation. Indeed, almost half our respondents (49 per cent) think the structure of the industry is not fit-for-purpose and 57 per cent think it lacks an innovation culture. The role of the regulator is also cited as a major brake on transformation: just one-in-four (23 per cent) think the regulatory framework is well-placed to deliver an efficient, flexible system, with the regime failing to incentivise technology developers, according to 58 per cent of our respondents.

This was certainly borne out by the energy network companies' response to Ofgem's latest RIIO-2 price control proposals, which the industry body said failed to reflect the pace of change and the risks that investors face[25]. Indeed, it appears that the allowed return-on-investment is about to be substantially reduced just as major transformational investment is required.

In order to deliver the transformation of the electricity system required over the next decade, to what extent are the following fit-for-purpose?

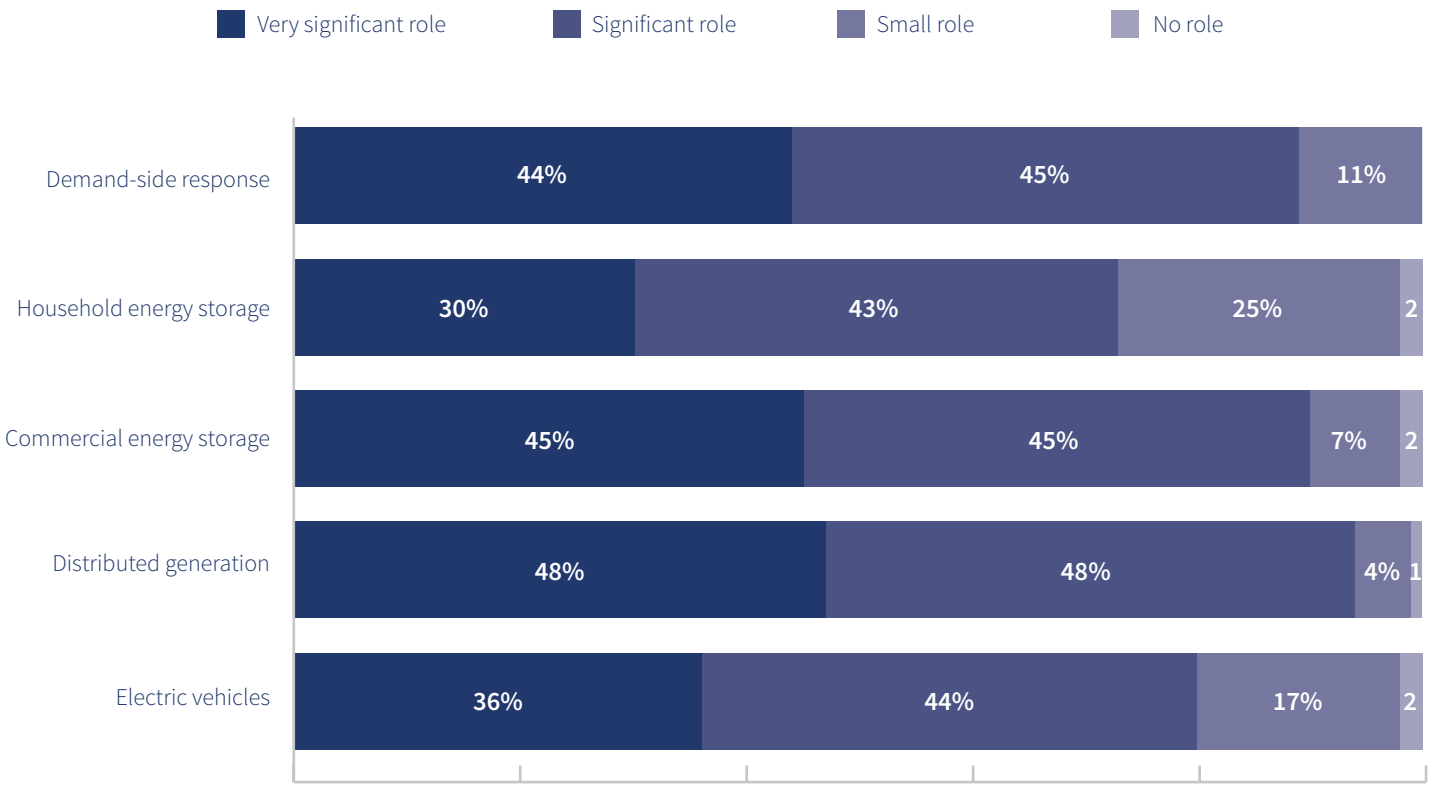


Storage: the key to a renewable, reliable energy future

The key to improving the capacity and flexibility of the system will be a blend of new technologies, with everything from commercial energy storage to distributed generation, to electric vehicles expected to contribute to a low-carbon future-fit electricity system. Our survey shows that the industry expects commercial energy storage and distributed generation to have the most significant impacts on the capacity and flexibility of the system – and both of these will require substantial investment if the new technology is to be effective.

[25] *http://www.energynetworks.org/news/press-releases/2018/december/energy-networks-comment-on-ofgem-riio-2-price-control-announcement.html*

How significant a role could the following technologies have in improving the capacity and flexibility of the system?



An energy system that is increasingly reliant on intermittent and distributed renewable energy will require significant energy storage if it is to have the capacity, flexibility and resilience to meet the demands of a developed economy. A number of technologies are being developed to solve this bottleneck: hydrogen fuel cells, compressed air energy storage, redox flow batteries and solid-state batteries.

To date, however, most attention has focused on lithium-ion batteries, currently the go-to solution for electric vehicles and, given the early successes of Tesla's 100MW facility paired with the Hornsdale windfarm in South Australia, set to lead the charge in utility-scale storage. Lithium-ion batteries are not without their issues, however, from battery life to safety concerns and high costs, not to mention the environmental issues of mining for this metal.

81% agree that, at present, battery technology is not developed enough to provide the level of flexibility the network needs

83% think the current regulatory framework is a barrier to large-scale roll-out of energy storage

The good news is that battery prices are falling: BloombergNEF estimates that the capital cost of a utility-scale lithium-ion battery storage system will slide 52 per cent between 2018 and 2030, transforming the economic case and driving a boom in the installation of energy storage systems around the world between now and 2040[26]. This will be led by utility-scale storage system until the mid-2030s, when behind-the-meter applications, based on business premises and residential properties, will overtake, enabling users to shift grid demand to reduce electricity costs, store excess solar rooftop output, improve power quality and reliability, and earn fees for helping to smooth voltage on the grid. This is the future but we're not there yet: four out of five (81 per cent) agree that, at present, battery technology is not developed enough to provide the level of flexibility the network needs.

[26]*Long Term Energy Storage Outlook, BNEF, November 2018*

And it's not just technology that needs to develop, with our current regulatory regime yet to adapt to the realities of a low carbon network: 83 per cent of our respondents think the current regulatory framework is a barrier to large-scale roll-out of energy storage. This creates uncertainty and is acting as a brake on the investment that will be crucial to overcome technology limitations: almost nine out of ten (89 per cent) agree that the investment proposition for storage is not yet clear enough to enable a significant roll-out to be financed.

Electric vehicles: the storage solution?

For many forecasters, electric vehicles will provide a key resource in providing the required storage capacity. Given that most cars sit immobile for most of the day, this model envisages inactive cars discharging their stored electricity for distribution across the grid to help meet demand during peak times and forestalling fears that the rise of electric vehicles will swamp the National Grid.

This vehicle-to-grid model is already being developed in the UK, where the Government has announced plans to ban the sale of petrol and diesel cars from 2040. In 2018, almost 60,000 electric and plug-in hybrid cars were registered, one new registration every nine minutes. Although still tiny compared to the 30 million-strong combustion fleet in the UK, the proportion of electric vehicles on our roads is expected to grow rapidly in the coming decade: it is estimated there will be 11 million electric vehicles on our roads by 2030 and 36 million by 2040[27]; indeed, Go Ultra Low, the joint Government and automotive industry lobby group, predicts that electric power will be the main propulsion method for UK cars as early as 2027.

What would this surge of electric vehicle ownership mean for electricity demand in the UK? According to National Grid, the increase in electricity peak demand could be as little as 8GW if consumers charge vehicles at off peak times and through vehicle-to-grid technology[28]. There are, of course, practical challenges to be overcome in the rollout of new charging infrastructure – not least that one-third of households in Great Britain don't have off road parking[29] – but technology is moving apace, including "flash battery" technologies that could allow a vehicle to run for a long distance from a five-minute charge and could support the introduction of more forecourt charging sites.

Just 44% think electric vehicles represent the most realistic strategy to achieve the level of storage necessary to improve system flexibility

For now, our respondents have yet to be convinced, with just four out of ten (44 per cent) backing electric vehicles as the most realistic strategy to achieve the level of storage necessary to improve system flexibility. There are certainly problems associated with relying on electric cars for grid storage, not least accelerating degradation of the EV battery, resulting in more frequent replacements and increasing the risk that drivers return to their vehicle to find less energy available than required for their journey[30]. Owner dissatisfaction with the reliability of their EV would clearly undermine the entire policy to decarbonise transport networks.

95% agree that without a substantial increase in capacity, electricity networks will be unable to cope with the scale of electric vehicle uptake anticipated in the Government's plans

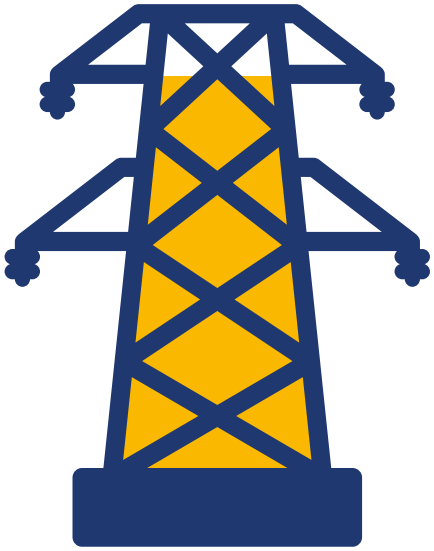
[27] *Future Energy Scenarios, National Grid, July 2018*
[28] *Future Energy Scenarios, National Grid, July 2018*
[29] *https://www.gov.uk/government/statistics/english-housing-survey-2016-stock-condition*
[30] *https://www.cenex.co.uk/wp-content/uploads/2017/01/Electric-vehicle-trends-challenges-and-future-technologies_v1.pdf*

Avoiding the utility death spiral

Delivering the transformation required to meet the demands of a decarbonised economy will require substantial investment. As network costs increase, there is an understandable fear about the implications for the industry. The combination of rising network costs and reduced costs of solar PV may drive more householders to generate their own energy. Indeed, 90 per cent of our respondents predict that as network costs increase and home generation becomes more economic, an increasing number of consumers will reduce their usage of the centralised grid.

This could prove to be the biggest threat yet: 63 per cent of our respondents can foresee a possible 'utility death spiral' as network costs are borne by a diminishing number of consumers. The meme of the "utility death spiral" initiated in the US, where retail electricity sales are down, while investor-owned utility capital spend on distribution and transmission infrastructure has doubled. Yet a number of utilities there are countering the death spiral by pivoting their business model to focus on service rather than sales. It's about using a utility's technology and expertise to identify energy efficiency gains or the most valuable locations for distributed solar and storage in order to help customers and innovative third parties deliver the distributed, low-carbon energy network of the future.

This only works, however, when the regulatory regime supports and incentivises energy efficiency and optimised networks. It's a message not lost on our respondents: 72 per cent of our surveyed executives cautioned that if incentives do not change, the network costs of 2030 will disproportionately be borne by vulnerable customers, as it will be wealthier consumers who supply themselves. It is clear it is not just the industry that will need to pivot; the regulators must also be ready for transformation to deliver a regime that is fit for purpose in the low carbon future.



90%

predict that as network costs increase and home generation becomes more economic, an increasing number of consumers will reduce their usage of the centralised grid

72% **agree that if incentives do not change, the network costs of 2030 will disproportionately be borne by vulnerable customers, as it will be wealthier consumers who supply themselves**

Chapter 5

Innovation in Asset Management

Innovation in Asset Management

The utilities sector is responsible for much of the strategic national infrastructure that underpins our way of life, from the clean water we drink every day, to the light and power to fuel an economy ranked fifth in the world by GDP. Yet the challenge of maintaining, upgrading and expanding the infrastructure to deliver these essential services cannot be over-stated; in its recent survey on the UK economy, the OECD noted that "aging infrastructure and a growing population contribute to existing pressures on the UK's infrastructure network".

It is not only the assets that are aging; organisations also face the loss of key expertise as experienced workers leave the workforce, investment needs continue to rise, customer expectations have never been as high – and nor has the regulator's appetite to intervene when standards slip.

97% agree that digital technology has the potential to revolutionise asset management

Despite these pressures, this is also a time of great opportunity as new technologies, from the Internet of Things to artificial intelligence (AI), capture vast reams of data from far flung assets, generate previously unimaginable insights into their performance and optimise the management and maintenance of those assets. Research by McKinsey suggests that new digital technologies could reduce operating expenses by up to 25 per cent and deliver performance gains of 20 to 40 per cent[31] in areas such as safety, reliability and regulatory compliance. From digital leak detectors on gas grids to using predictive models to schedule maintenance, technology is equipping human workers with the data they need to make better and faster decisions – and sometimes that means doing nothing.

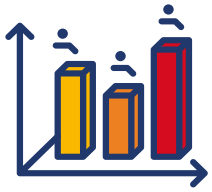
One distribution operator, for example, both improved supply quality and saved 10 to 15 per cent of its maintenance spending on distribution feeders by delaying inspections in areas with very low probability of failure, while another decided to increase the frequency of inspections of relatively healthy assets that, should they fail, would have a disproportionate effect on the network[32]. These decisions can only be taken when operators have access to both good quality real-time data and advanced analytics capable of forecasting likely outcomes.

Our respondents are almost unanimous that we stand on the cusp of huge transformation, with 97 per cent agreeing that digital technology has the potential to revolutionise asset management.

Sensors: capturing asset data

73% said improved analytical capability will be very important to enabling digital transformation

Sensors are an essential component of this revolution, giving engineers eyes and ears on the condition and performance of remote or buried assets. These technologies are developing fast, with Gartner expecting the market to evolve continuously through 2023 as new generation sensors are developed that can detect an even wider range of situations and events, and new algorithms emerge to deduce more information from existing sensors[33]. Costs are also coming down. In 2004 the average cost of a sensor was US$1.30; by next year, that is expected to be US$0.38, enabling companies to collect more data and make better decisions at lower cost[34].



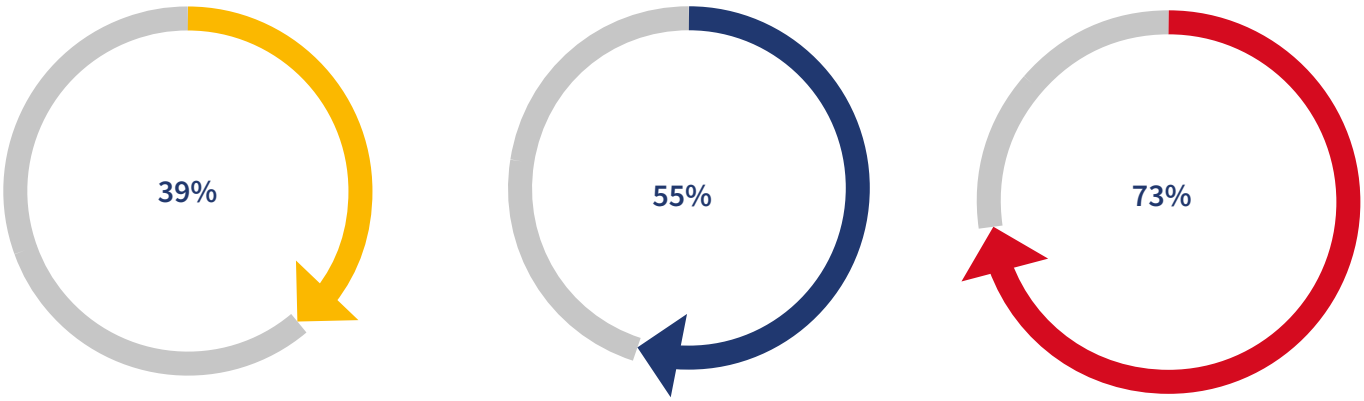
73% believe improved analytical capability will be very important to enabling digital transformation

78% think the ability to make better decisions about when and how to intervene will be a very significant benefit of digital transformation

Yet the importance of cheaper, better sensors will be eclipsed by what organisations can do with the data they capture from their sensors: almost three-quarters (73 per cent) of our respondents said improved analytical capability will be very important to enabling digital transformation, with 78 per cent highlighting the ability to make better decisions about when and how to intervene.

[31] *The New Digital Utility, McKinsey & Co, June 2018*
[32] *The New Digital Utility, McKinsey & Co, June 2018*
[33] *https://www.gartner.com/en/newsroom/press-releases/2018-11-07-gartner-identifies-top-10-strategic-iot-technologies-and-trends*
[34] *https://www.theatlas.com/charts/BJsmCFAl*

Percentage of respondents who ranked the following factors as very important to digital transformation



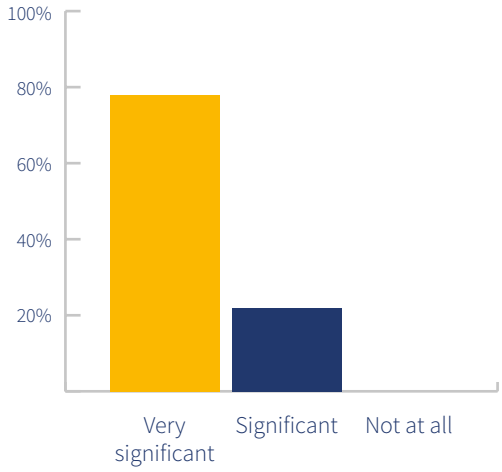
Reduced sensor cost

Improved sensor technology

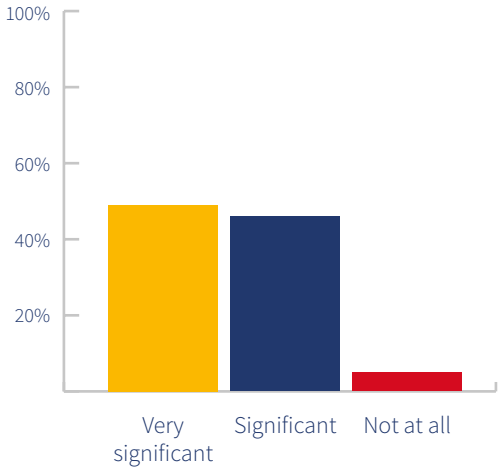
Improved analytical capability

How significant will the following benefits of digital transformation be?

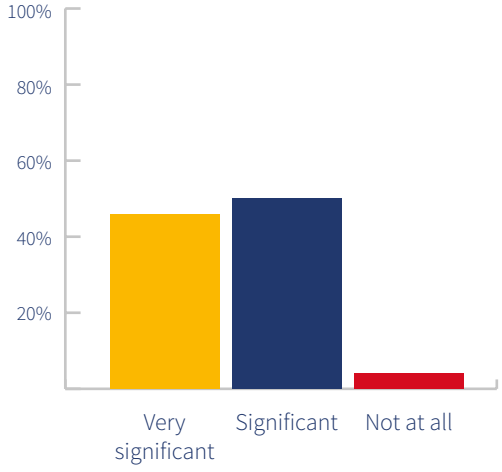
Better decisions about when and how to intervene



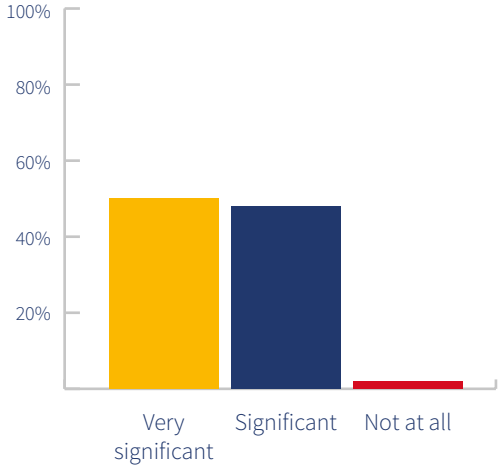
A reduction in incidents



Overall cost reduction



Improved productivity



Getting ahead of incidents

The ability to make timely and data-driven decisions is never more important than when dealing with incidents. And this ability is being tested like never before as climate change continues to up the stakes, with freeze/thaw incidents, flooding, drought and other extreme weather events occurring more frequently and with greater severity, putting infrastructure under stress and testing the capacity of utilities companies to respond with speed, compassion and solutions.

Technology has a key role to play here, with sensors able to detect vulnerabilities in the infrastructure to enable early intervention and advanced analytics able to forecast extreme events and model their impact, so that utilities companies can give guidance and reassurance to customers and better plan their response.

During the droughts of Summer 2018, for example, NI Water used historical weather data to model inflow and outflow scenarios to map the projected storage of reservoirs and decide which reservoirs to prioritise. At the other end of the weather extreme, Northumbrian Water has been using Digital Twin technology – in which a virtual "twin" model of the real world is created – in order to simulate the impact of a burst pipe or heavy rainfall to help the water company understand likely outcomes and prioritise the appropriate response actions. The twin model draws on and integrates a wide range of data sources, including LIDAR maps, land cover maps, water company infrastructure information and dynamic weather, traffic and air quality data from the Urban Observatory (a digital urban sensing network of over 2,700 metrics freely available online), to provide insights into elements of the water and wastewater system that might lack capacity under more extreme rainfall or test the resilience of water infrastructure against a major flood event.

Little wonder almost 95 per cent of our respondents expect digital technology to have a significant impact on incident rates and 98 per cent believe it will be important for energy and water networks to move from passive to active asset management if they are to meet incident reduction targets.

Barriers to digital transformation

86%

think siloed data or data held in non-digital formats acts as a significant barrier to achieving a step change in asset management

Yet, it's clear from our findings that there are significant barriers to this brave new world of asset management. As with so many industries seeking to capture the benefits of digitisation, legacy systems act as a block on change: 86 per cent of our respondents said siloed data or data held in non-digital formats acted as a significant barrier to achieving a step change in asset management. Getting to grips with data that is scarce, patchy, or not even digitised can appear overwhelming yet there are new data management techniques and advanced analytics that can bridge the data gap: data-validation algorithms, for example, raise alarms to enable anomalous data to be corrected, heuristic algorithms can plug data holes, while machine learning and natural-language processing techniques can capture and digitise data from documents and free text.

82% agree that a lack of analytical capability is a significant barrier to change

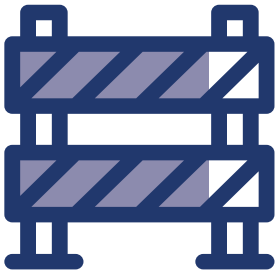
Yet too many utilities companies lack the analytical capacity to make the most of their data, regardless of its current condition or format: 82 per cent of our respondents said a lack of analytical capability was a significant barrier to change.

Organisations are not just struggling with technology issues. Digital transformation is as much a cultural change as a technology change and almost four out of five of our surveyed organisations said a lack of organisational buy-in was impeding progress, while almost two-thirds said their senior management is baulking at the initial investment costs. This is not unique to the utilities industry. According to research by Gartner Inc, 67 per cent of organisations have already completed culture change initiatives or are in the process of doing so because their current culture had been identified as a barrier to digital transformation; indeed, the research group reckons that in 50 per cent of cases, digital transformation initiatives fail and culture is identified as the main barrier[35]. Embedding a culture that fosters innovation, embraces change and can pivot in response to changing market conditions will be essential if utilities are to succeed. Use cases for advanced analytics should be identified and prioritised in order to deliver early wins that innovation champions can use to secure organisational buy-in and unlock budget for more transformative applications that can deliver a step change for the organisation.

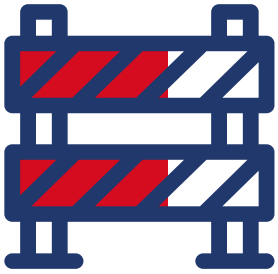
Percentage of respondents who cited the following as significant barriers to achieving a step change in asset management

Data held in silos or non-digital format
86%

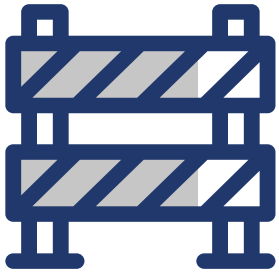
Lack of analytical capability
82%



Lack of organisational buy-in
79%



The regulatory framework
62%



Initial investment cost
74%

A failure to overcome these roadblocks will leave organisations blind to the realities of their networks and unable to harness the transformational power of new digital technologies to improve asset performance and reduce operating costs. Indeed, 96 per cent of our respondents agreed that unless networks commit to investing in analytical capacity, they will not obtain the full benefits of improvements in sensor technology.

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[35]*https://www.gartner.com/en/newsroom/press-releases/2019-02-11-gartner-predicts-by-2021--cios-will-be-as-responsible*

New data sources

96% agree that in order to improve incident response, networks must utilise a wider pool of data then they've traditionally handled

It is not just sensors that are opening up new streams of data to feed the advanced algorithms that will help utilities model different scenarios, forecast risk and optimise asset management. We now live in a data-rich universe, with utilities able to mine data streams from satellites, drones, smart meters and weather stations for insights that will help them understand risks facing key infrastructure. Yet many of these new data sources are currently ignored by the industry, leaving them vulnerable to being ill-equipped to respond when things go wrong: 96 per cent of our respondents said that in order to improve incident response, networks must utilise a wider pool of data then they've traditionally handled.

Yet our research suggests the industry is a long way from being able to effectively collect and analyse these new data sources. Indeed, even when it comes to their own data points, too many companies are struggling: almost a third (28 per cent) of our respondents are not at all confident in their organisation's ability to make the most out of data from sensors installed throughout the system.

It should not be a surprise, therefore, that the industry is at last preparing to close this data gap by a surge in investment. Almost three-quarters (73 per cent) of our surveyed respondents say they expect a large increase in investment in analytical capacity at their organisation over the next three years, suggesting the coming decade will see a transformation in how assets are monitored and managed. The revolution is coming; it just got off to a slow start.

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