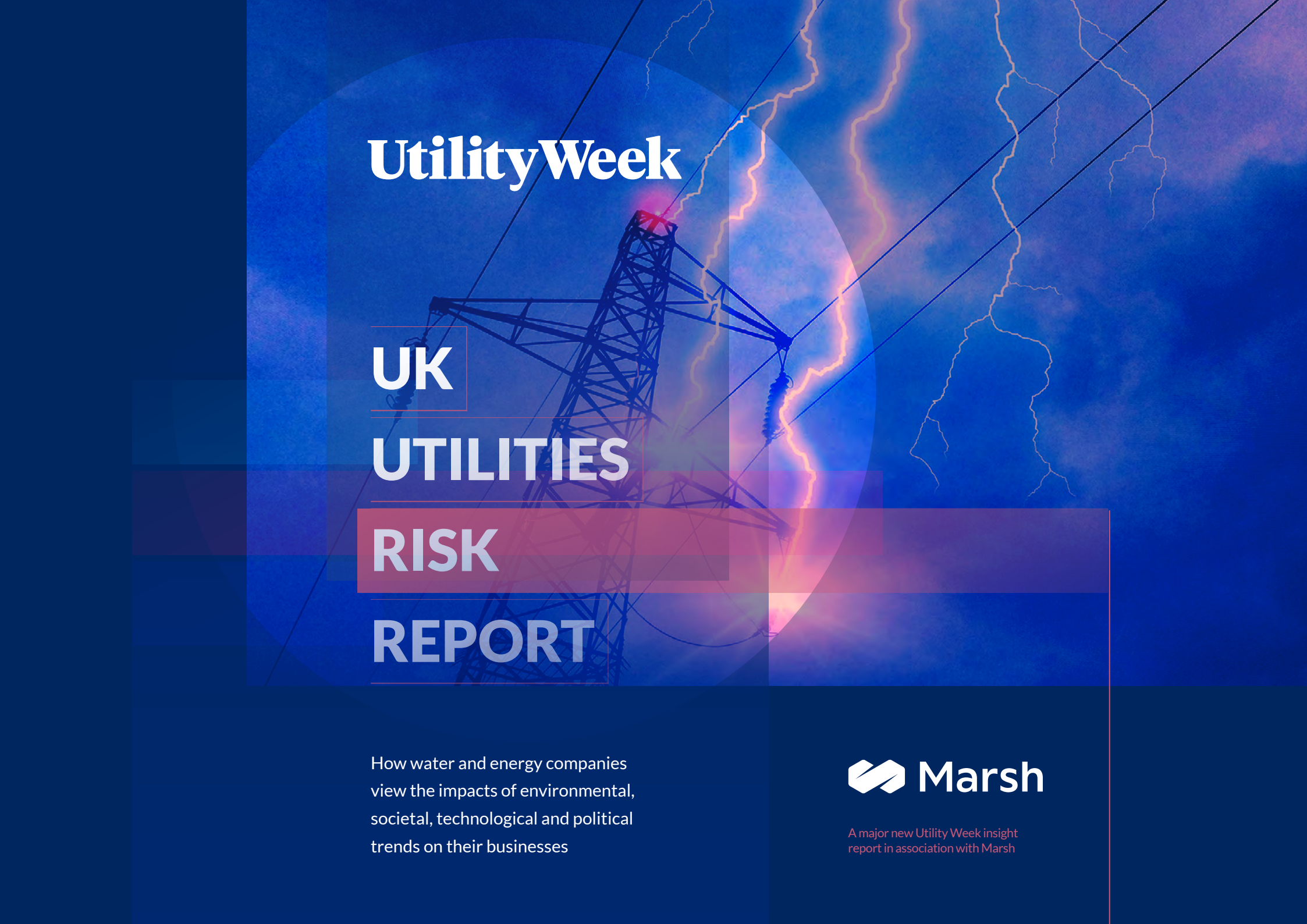

Utility Week

UK UTILITIES RISK REPORT

How water and energy companies view the impacts of environmental, societal, technological and political trends on their businesses

Marsh

A major new Utility Week insight report in association with Marsh

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UK UTILITIES RISK REPORT

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FOREWORD

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At Marsh, we are proud to be partnering with Utility Week in publishing this report into the evolving risk landscape facing UK utilities.

It goes without saying that change is constant and necessary. But, more so now than ever, there is a greater sense of urgency, driven by a multitude of risk factors such as climate change. Risks that were once on the horizon are accelerating their way into the present, testing utility companies' resilience and preparedness. As a result, utilities are rethinking their approach to risks having acknowledged that past solutions are no longer fit for the future and cannot meet society's net-zero ambitions. This is all against a challenging operating environment of heightened regulatory focus and growing public expectations and demands.

Perhaps a case of 'faster-paced-evolution' as opposed to 'revolution', adapting to this changing risk landscape requires a different approach. Two examples are water utilities adopting more nature-based solutions and the gas sector's role in the hydrogen economy of the future. However, utilities don't operate in a vacuum and, as this report highlights, there are significant risks and unintended consequences where such change happens faster than anticipated and the adaptation occurs without careful thought.

The pandemic has tested utilities' working practices, resilience and preparedness in a way that is likely to leave a lasting impact. Having the ability to attract and retain talent now has an increased focus with many utility companies putting more robust strategies in place to manage this risk. As you will see in the results of this survey, more work is needed here. The challenge facing utilities is how to attract new talent into the industry when the competition for talent sits outside the sector, such as in the technology sector or gig-economy.

There is no doubt that these are challenging times for utilities. However it is important to acknowledge that with risk comes opportunity. With the right data, information and insight utilities will adapt to these risks and maximise the opportunities ahead. At fundamental level utilities must continue to provide reliable and life-essential services, whilst also driving faster-paced innovation and meet growing customer expectations.

As the utility sector experiences disruption at an unprecedented pace and scale, Marsh draws upon deep industry and cross-sector expertise to support clients across the entire value chain. We help organisations to successfully navigate their risk landscape by addressing strategic and operational challenges with bespoke people and risk management solutions to help deliver greater clarity and control.

The results of this survey highlight the many challenges that utilities are facing today and those they are concerned by over the next five years. The steps utilities can take to mitigate these risks and adapt to them are far-ranging and require a change of mind-set in some instances, investment in others and collaboration across the sector, with political support no doubt required.

We are delighted to partner and collaborate with Utility Week on the launch of this risk survey and thank all those that completed the survey and participated in the interviews. We hope you enjoy reading the results.

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INTRODUCTION AND KEY FINDINGS

About the survey

Utility Week's first risk report in conjunction with leading global risk and insurance broker Marsh comes at a time of immense challenge for utilities. Risks on registers have turned into reality as utility companies have battled the elements and began bracing themselves for a deluge of companies and consumers unable to pay their bills. During February utility companies had to struggle to keep services up and running during three named storms in a week. Lack of wind, problems with interconnectors and growth in demand coming out of the pandemic, have seen energy prices climb over the past six months. The impact has been to send dozens of energy retailers out of business and customers' bills rocketing – and that was before Russia's invasion of Ukraine. The conflict there has led to greater threat levels of cyber-attacks on critical infrastructure, as well as tightening global gas and oil supplies and surging fuel prices at the pumps.

Meanwhile, consumer groups, politicians and environmental agencies have turned the spotlight on water and combined sewer overflows, with Ofwat launching enforcement cases into five water companies after finding cause for "serious concern" about their management of wastewater.

The challenges of today will no doubt have had a bearing on the respondents to our survey, the results of which formed the basis of the report. The online survey sought to determine what utility companies see as the major risks they face over the next five to ten years. They were asked to mark 24 risk factors across five potential areas of risk:

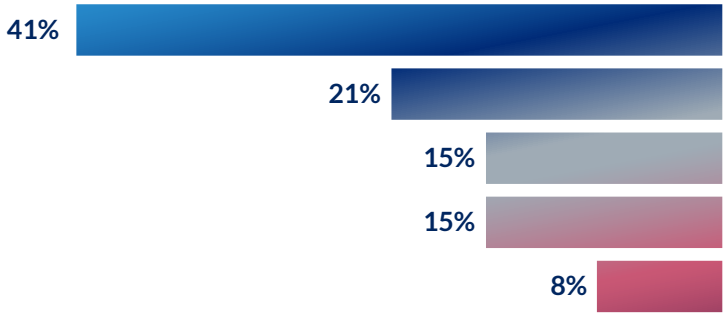
- **Policy and regulatory risks**
- **Societal risks**
- **Environmental risks**
- **Investment and skills risks**
- **Digital and security risks**

Participants were asked to rate the likelihood of the risk occurring and then if it did happen, what the impact would be on their business. We also asked survey participants how confident they were that risks could be mitigated – and whether successful mitigation relied on action being taken.

Methodology and participants' profile

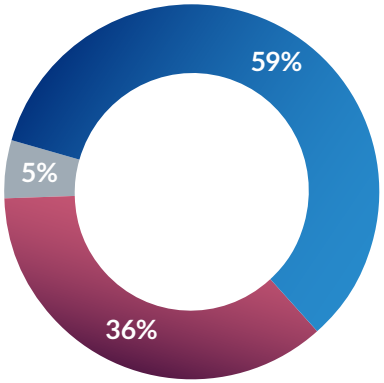
Senior managers in utilities were invited to take part in our online survey which ran from January 7 to February 2. Of those invited, a strong representation across the utilities spectrum responded across 23 different companies. Responses were then followed up by in-depth interviews with respondents also drawn from across the range of utilities. These interviews were conducted between February 16 and March 4. The interviews were conducted to understand the issues and circumstances driving the risks, and provided the narrative for this report.

Survey participants broke down along the following sector lines:



- Energy network (Gas transmission and distribution and electricity transmission and distribution)
- Energy retailer
- Water only
- Water and sewerage company
- Other

In terms of survey participants' job functions:



- Over a third were directors and board directors
- Nearly 60% were chiefs or heads of department
- And 5% were managers.

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Top 10 risks

Participants were asked to score 24 risk factors out of a maximum of five for both likelihood and impact on their business, with five being extremely likely and having the biggest impact on their business. The average scores for each risk factor for both likelihood and impact were multiplied to reveal what are seen as the biggest risks for utilities as a whole.

Even though the survey was carried out before the latest developments in Ukraine, cybersecurity was already the number one risk factor, according to the survey results. As both water and energy sectors look to digitalise and introduce more devices on to their networks, such as monitors, and sensors this would only increase risks, they said. The move to open data would also increase security risks.

Across the board, those interviewed felt that policy and regulation is not keeping pace with technological development and the need to decarbonise represented a major risk, particularly for those from gas networks. These companies faced existential threats to their businesses, and continued uncertainty in heat policy and how this would evolve was making it impossible to plan for investment in their future. As interviewees also pointed out, the plethora of storms the UK was already experiencing was a sign of things to come, which would test the resilience of ageing infrastructure if investment was not boosted in forthcoming price reviews.

Attitudes to risk are discussed in greater detail in the following chapters.

Summary of top 10 risks

1. A serious cybersecurity breach (score 17.44)
2. Policy does not develop fast enough or lacks the necessary detail to enable utilities to invest (16.60)
3. Regulation does not adapt quick enough to match the demands on utilities (16.00)
4. Increasingly extreme and unpredictable weather (15.49)
5. Prices for essential resources rise unsustainably on global markets (15.18)
6. Skilled workers are enticed away from the sector (13.96)
7. Erosion of public trust in utilities (13.53)
8. Constraints on water/energy supply leading to problems balancing supply and demand (13.02)
9. Government directly intervenes around affordability, ie, price cap (12.97)
10. A major shift in the proportion of customers struggling to pay their utilities bills (12.79)

Summary of risk factors by sector can be found on page 35.

POLICY AND REGULATORY RISKS

1

Policy and regulation slow to develop in energy retail

As highly regulated industries, underpinned by government policy, energy retailers, transmission and distribution companies and water businesses are very much shaped by the working of Whitehall and watchdogs. Yet like other businesses they need to move with the times and adapt to outside influences thrown at them. Perhaps it's not surprising, therefore, that the inability of policy to keep pace with change, and of regulation to keep pace with both change and policy, is one of the major sources of risk.

'Policy not developing fast enough or lacks the necessary detail to enable utilities to invest' and 'regulation does not adapt quick enough to match the demands on utilities' were second and third to cybersecurity in terms of perceived overall risks. Average scores for both was 4 out 5.

Three-quarters of respondents to the survey said the the most likely risk was policy not developing fast enough or lacking the necessary detail to enable companies to invest. And even more - 8 out ten (82%) - said it would have a

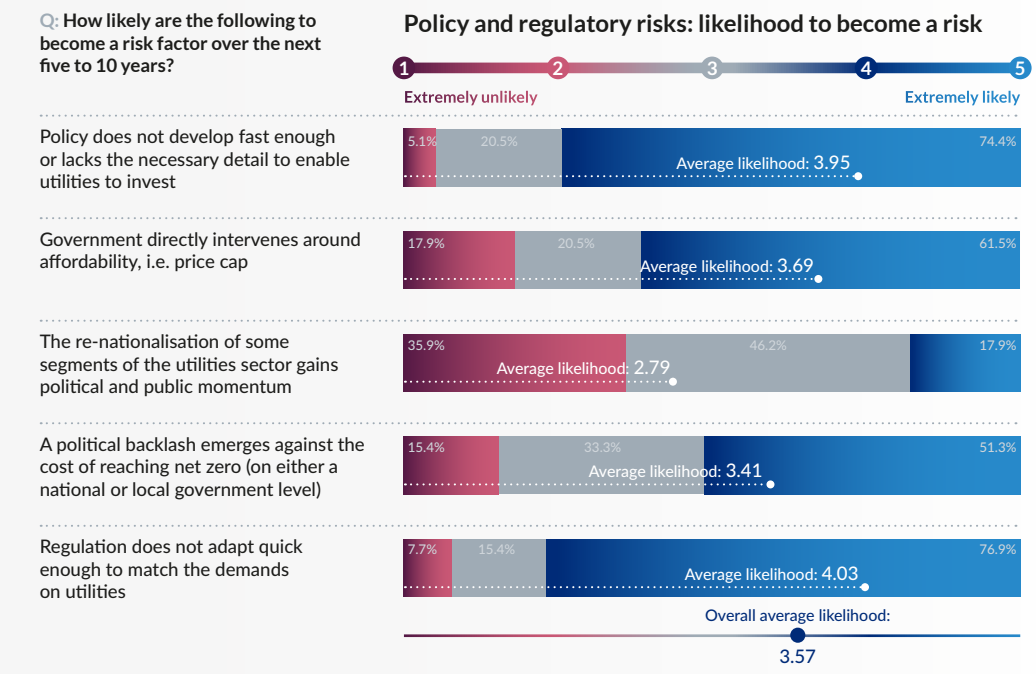
high or extremely high impact on business, with energy networks, energy retailers and water – in that order – scoring the slow development and adaptation of policy and regulation as having the biggest impact on the business.

At the crux of the concern is that the change and challenge utilities face have both quickened in pace and levels of intensity. Policy – particularly to do with energy – has failed to evolve at the same speed. Regulation, they said, is framed for almost a bygone era.

Or as a director of strategy at one large energy supplier put it: "In a world where we're facing a combination of gas price rises, a huge range of retail failures, together with the growing debate in the energy sector about the wholesale market and the journey to net zero, the whole landscape for operating is changing very fast.

"And that's at a time when politicians are highly distracted – with Brexit, the pandemic, global turmoil and internal crises."

This director continued: "I would say the government has been distracted since it came out in 2016 with a lot of promised policy changes. Greg Clark promised an Energy White Paper, which only arrived as he left the role as secretary of state. We're supposed to be getting an Energy Bill next year, but will it happen?"



"The point is that it's all moving much more slowly and people are worried by the uncertainty and therefore level of risk.

"We've known for some years now that nuclear stations are coming to the end of their life; gas stations are not getting younger. We desperately need more investment to provide security of supply.

"Meanwhile, the clock is ticking on net zero and we desperately need more detail to come out in the next Energy Bill, whenever that might be."

The interviews were carried out before the government launched its energy security strategy in April. Interviewees from the energy sector said they were looking for a strong steer from government across the four key tenets of energy policy:

- **Security of supply**
- **Climate impact**
- **Jobs impact and**
- **Affordability.**

"How does it intend to set the course for those elements? And what role does it want supply / generators and networks to play?

"I guess we want to know, where is the government going? And what is it going to put in place to make it attractive for companies – it's difficult to make a case for investing in an energy retailer on the returns we have."

Another retailer interviewed echoed similar sentiment: "The big risks I see are more around policy, the speed of policy development, and change. Particularly, I would say around the decarbonisation agenda, if I'm thinking more strategically, that's where we really need to see the government taking bold steps.

"If you think about something, for example like decarbonisation of heating, that will require some very great decisions to be made. It feels as though policymaking is developing at a very slow rate, which is going to leave a lot to do until the last minute."

Reflecting on the current energy situation, this retailer added: "But it is very difficult to push for that in a world where all the attention is necessarily on the short-term crisis. You know, it's very difficult."

One chink of light as far as retailers were concerned was that the obsession with getting customers to switch. The failure of dozens of suppliers has made government realise they need to work with retailers, both to help consumers get through the current turmoil and in the transition to net zero, "rather than view them as an unnecessary evil", is how one retail interviewee put it.

Nearly nine out of ten (88%) retailers pointed to inadequate policy development as being likely or extremely likely to become a risk; and three-quarters (75%) said the same about regulation not adapting quickly enough – though a little oddly these percentages fell away when asked what the impact would be to the business if it were to become a risk.

Certainly, one commercial energy retailer said that failure of regulation to adapt to the needs of utilities continued to impact their business. They pointed to the poorly executed Renewables Obligation policy. Because it has only been collected annually, rather than more frequently, it has meant that as companies have gone under in the domestic sector, remaining domestic suppliers and commercial ones have had to step in as part of the mutualisation process. "I think one of the key risks that we still see going forward is further mutualisation in the future. And we believe that's an issue that needs to be resolved by government working with Ofgem.

"So that's certainly a key for us in terms of risk going forward. Around £6 billion in total is how much cash is collected by suppliers to pay renewable generators. It dwarfs the Feed-in Tariff [FIT] scheme, or the new green gas levy that the government introduced at the start of this year. Yet, despite a massive scheme, it doesn't require suppliers to pay as frequently or to put aside collateral in the same way as the other schemes do.

Q: How likely are the following to become a risk factor over the next five to 10 years? % likely / extremely likely to become a risk	Overall	Energy networks	Energy retailers	Water companies
Policy does not develop fast enough or lacks the necessary detail to enable utilities to invest	74.4%	81.3%	87.5%	66.7%
Government directly intervenes around affordability, i.e. price cap	61.5%	81.3%	50.0%	33.3%
The re-nationalisation of some segments of the utilities sector gains political and public momentum	17.9%	25.0%	0.0%	25.0%
A political backlash emerges against the cost of reaching net zero (on either a national or local government level)	51.3%	62.5%	75.0%	25.0%
Regulation does not adapt quick enough to match the demands on utilities	76.9%	87.5%	75.0%	66.7%

"We've had four years in a row where suppliers have failed to pay. And that has meant the industry has had to contribute about £400 million to cover for the suppliers that didn't pay in. It's not an insignificant amount of money. It would be resolved by suppliers paying more frequently."

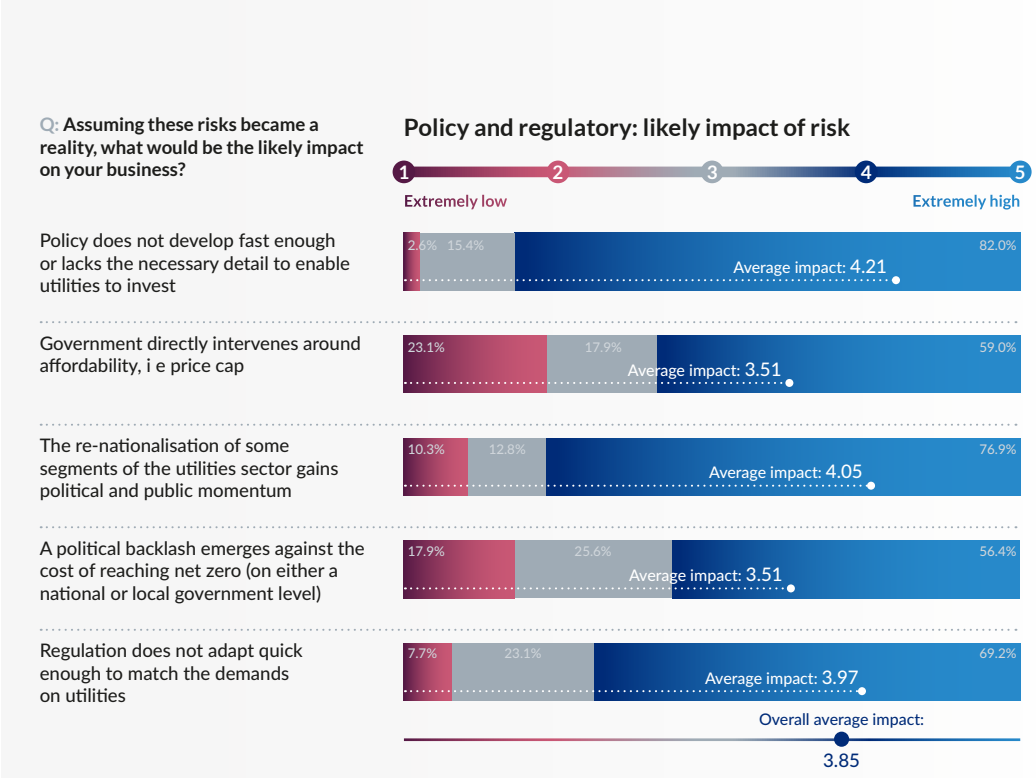
"In terms of sustainability and climate reporting, Marsh notes that there will be increased rigour and scrutiny on utility companies providing information within their annual reports and accounts or standalone reporting due to Task Force on Climate-Related Financial Disclosures (TCFD) coming into force as well as future increased requirements on Sustainability Disclosure Requirements (SDRs) for large companies. Assessing, controlling and governing the associated risks and opportunities will be a focus for all utility companies over the coming years," says Dr Bev Adams, head of climate resilience and strategy at Marsh.

Adams goes on to say "Environmental, Social and Governance (ESG) reporting is also increasingly driving water and energy companies to consider their public facing statements about future strategy and policies relating to climate and other issues. If companies don't assess their ESG and climate risk, someone else will. Marsh is helping companies understand/score their ESG risks and priorities for action using the gap analysis and benchmarking ESG Risk Rating tool".

Networks and heat policy

Likelihood of policies not developing fast enough (81%) and regulation not adapting quickly enough (88%) were rated highly as risk factors for energy networks. One of the key factors to emerge from the interviews has been the uncertainty that remains over heat policies. The issue is particularly acute in gas networks, where the phasing out of fossil fuels potentially provides an existential threat to the business.

Though those interviewed from the gas side are convinced that hydrogen will have a role to play in gas networks, there remains lack of clarity about the extent. The risk is further heightened by the fact that even if policy develops in a way that is favourable to hydrogen heating, say, there is the unknown of whether the public would opt to transition to this fuel to heat their homes, or whether they would plump for electric heating of some sort. A director of a gas network made the point that the transition to green electricity has been easier in that it has not affected the public in the same way. "It's still the same electrons going through the wires. With hydrogen, you're changing from one gas to another gas."



"Getting to net zero means there is going to be 20 years of change ahead. If you get clearer policies, you get more of an idea of which track you might be heading down," said a director of one network company.

"However, I'd be amazed if any policy enhancements give absolute clarity on the outcome. And actually, you know, one of the questions I think is how much do we need a mandated kind of approach to net zero? Versus do we let the consumer choose the option? And that's still a debate to be had."

"Of course, it might be the other way round in the sense that those people might not want to move to heat pumps and prefer to wait for an alternative to traditional gas central heating to come along.

"So, if we don't work through how we're going to transform the market arrangements as well as the regulatory arrangements to move from methane to hydrogen then we're not going to be able to make those investments, those changes in a timely fashion."

Another gas network specialist said that there was concern about who would make this decision at a local level. "Would that be a LEAP [Local Energy Advice Partnership] or would some sort of local authority-based organisation have to have the powers and the ability to make decisions about the energy solutions that are going to be deployed in specific areas? A distribution network operator (DNO) can't do that – we can't mandate people to become part of a heat network, for example."

They added: "One of my frustrations is the bulk of the strategy is just running around doing innovation projects: billions, billions of pounds being spent on innovation projects, instead of making a policy decision and saying this is the horse we're going to back. It's a really convenient way of being seen to be doing something but not doing anything."

Q: Assuming these risks became a reality, what would be the likely impact on your business? % high / extremely high impact on business	Overall	Energy networks	Energy retailers	Water companies
Policy does not develop fast enough or lacks the necessary detail to enable utilities to invest	**82.1%**	93.8%	75.0%	66.7%
Government directly intervenes around affordability, i.e. price cap	**59.0%**	50.0%	75.0%	58.3%
The re-nationalisation of some segments of the utilities sector gains political and public momentum	**76.9%**	81.3%	75.0%	75.0%
A political backlash emerges against the cost of reaching net zero (on either a national or local government level)	**56.4%**	75.0%	62.5%	25.0%
Regulation does not adapt quick enough to match the demands on utilities	**69.2%**	87.5%	37.5%	66.7%

Lack of investment

The next price control period for networks and how much is allocated for strategic investment is seen as critical in terms of transitioning to net zero, providing extra capacity on the system and boosting resilience in the face of increasing bouts of extreme weather. Some of these aspects are discussed on in other sections.

Failure of regulation to keep pace with change is also a problem for IT investment, which is discussed in the Digital Chapter.

Networks and water companies both pointed to a key problem with regulation and the risk that regulators failed to keep pace with the need for investment to boost resilience and move to net zero. A senior manager from networks commented: "The regulator is still in a world where everything has to be justified. And the case for everything needs to be very robust. And you need to have evidence of that requirement. But we're moving into a world where to deliver the volume of assets that are required to support low carbon technologies means that we're going to have to be investing before they're needed."

"Some of the conversations that are happening or have happened over the last year are indicative of Ofgem waking up to that. But I think some of their inherent behaviours don't yet recognise that."

As the network expert pointed out, Ofgem does not want to be allocating investment to boost capacity – at the risk of this being passed on to bills – if it's not needed because the projected additional load for things like EVs, heat pumps, etc never happens.

"And then it becomes a self-fulfilling prophecy. It doesn't happen, because the networks aren't there."

Meanwhile, the next price control for water, PR24, will see companies take a long-term view in their business plans, setting out policies for boosting resilience and mitigating for shortages over a 25-year period. This is helping to counter past criticisms that five-year review period is counter to strategic thinking. However, though welcome, it was pointed out by one interviewee "that it won't be clear if that works until we see the outcomes and whether it has proved successful or not".

Political backlash

Overall, just over half of the respondents (51%) pointed to a political backlash against reaching net zero as a high or extremely high risk and a similar number (56%) scoring this has having a high impact on their business should it become reality. Across utilities the average score was 3.4 out of 5 for likelihood and 3.5 for impact. The sentiment was particularly high among retailers. Three-quarters of energy retailers (75%) rated a political backlash emerging against the cost of reaching net zero as a high-risk factor. One interviewee thought that there could be a distinct possibility of this, given current, high wholesale prices.

"On the one hand, if you decarbonise, you will be less exposed to global gas prices. But unfortunately, it will cost money to decarbonise."

A backlash would then have an impact on the business if government itself ended up putting the brakes on in response to public sentiment.

Renationalisation

One of the lower risk factors to emerge (average score 2.8 across all respondents) was the prospect of renationalisation, an idea that had gathered momentum under Jeremy Corbyn's leadership of the Labour Party. Overall, only 18% thought it a high-risk factor. Interviewees felt it was definitely off the table currently.

Looking further into the future, they could not discount renationalisation returning to the agenda. They said whether it did become a political aspiration again would largely depend on customers' perception of fairness. If bills were going up yet profits were getting bigger that would raise the issue again, they thought. "If there's not an equitable outcome that people are happy with, politicians could return to the idea," said a water company operations director. "That's why the next price control is so critical."

"But it is frustrating that the perceived value of water is so low. People go and spend a £1 buying a bottle of water from the shop, which is the same amount of money for all your water and all your sewerage for the day at home.

"But getting that message across is really difficult; a 20 pence a day rise in bills would be tiny in comparison to what households are paying on electricity and gas but make a huge difference to the water sector."

One network operator said the whole issue around privatisation would be an unwelcome sideshow – and create risks to the bigger picture, which is the transition to net zero. "Having worked in both private and national, it makes little difference. So why would we focus on these sorts of topics in the future? It just detracts us from dealing with actual problems."

Another view proffered by a water company chief executive was the risk that even if the sector was not renationalised, more stringent government intervention in how companies are run could have the same effect as nationalisation.

SOCIETAL IMPACT

2

Affordability and inability to pay bills

The red flag in this category of questions focusing on societal risk was a major shift in the proportion of customers struggling to pay their bills, earning a risk factor score of 3.6. Unsurprisingly, nearly nine out of ten energy retailers (88%) marked this as a high-risk factor over the next five to ten years, with the same percentage saying the likely impact on the business would be high.

For water companies, the high risk and high business impact factor was a constraint on supply, leading to problems balancing supply and demand – and aligned to that, significant population growth putting unsustainable demand on supply.

These concerns were apparent in interviews following up on the survey.

Retailers are already concerned about the ability of customers to pay their bills. The price cap rose by 54% in April to take the standard variable tariff rate up to £1,971 per year for an average dual fuel bill, paying on direct debit. A number of analysts are predicting this figure could hit £3,000 when it is reviewed again in October 2022.

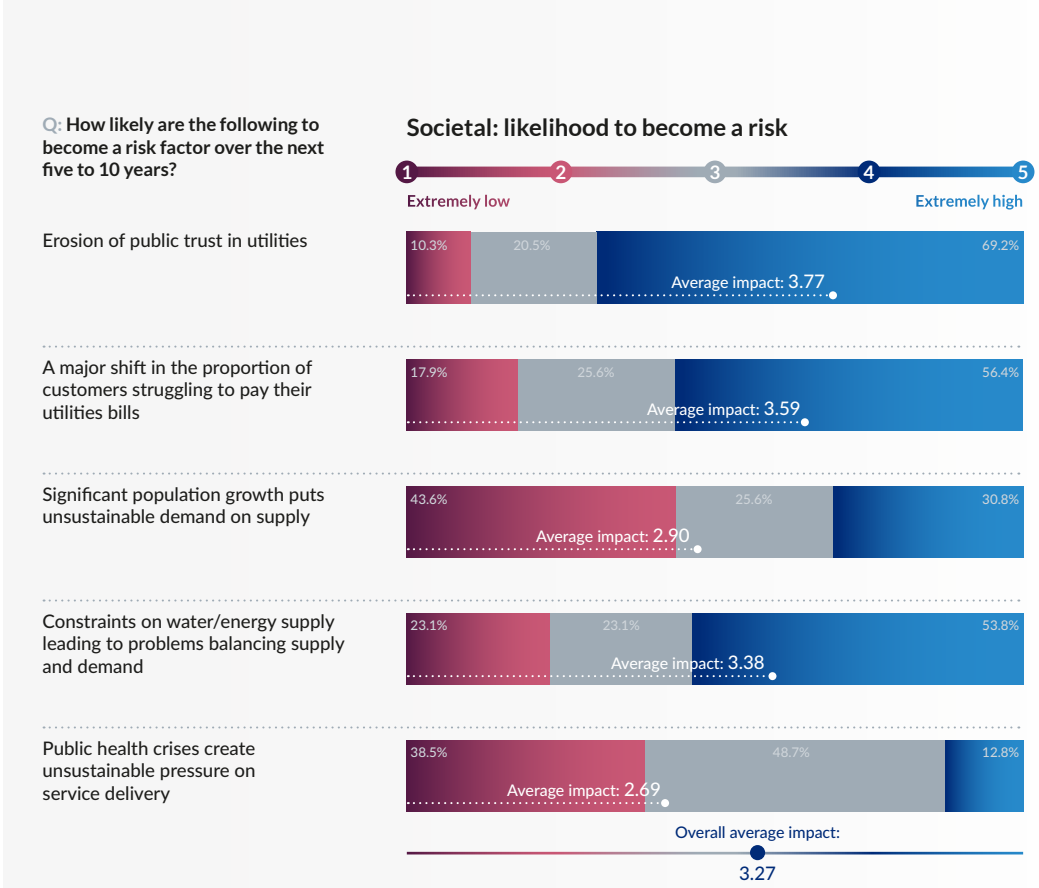
In a market where fuel costs are at giddying heights, energy retailers say that a lack of affordability is rapidly turning from "risk" to reality in the short term. The government's £350 Council Tax rebate for those living in

homes with lower rating bands will do little to ease the burden.

While it was acknowledged that the wholesale price rises in energy which have been driving the current hikes may moderate in the medium term, it was felt that these would have to be replaced by the costs of reaching net zero.

One senior director whose company is in generation and retail remarked: "If you look at all the investment that needs to happen – the construction of wind farms, network upgrading, insulating the housing stock, and wiring all the towns and vehicles for EVs – there's a huge amount to do. All of it will hit bills at some point.

"We're all very worried about that at the moment. And it may not get better. We used to have about 6-8% of customers in fuel stress, that is spending more than 10% of their disposable income. That percentage is going up and up, and alongside that there is rising interest rates and hikes in petrol costs and the general cost of living. Council Tax and National Insurance rises are coming too.



"Once homes are better insulated and heat pumps are installed, then energy bills will go down, but households can only invest in those things if money is there in the first place," this director said.

Another put the affordability situation more strongly, referring to the looming crisis as "catastrophic", saying: "It's very difficult to have this conversation, without reflecting on the invasion of Ukraine by Russia. I think affordability is an enormous challenge, actually, for the utility sector. I suppose it's the energy retailers that will feel that first. The water companies will be impacted later by the increasing energy costs that they will need to pass through to their customers."

They added: "Network companies are largely insulated on the question of affordability because the retailers have to pay them regardless of whether the retailers themselves have been paid. I don't think it's surprising that it doesn't come higher up as a risk for networks and water companies, but actually it is a huge risk – and it has become more than a risk, it's now a real issue.

"If we all thought we had an affordability challenge a month ago, which required the government to step in with an intervention, believe me the affordability challenge is very much bigger now. And without further intervention to support customers being able to pay their bills, it's going to be catastrophic."

63%
of network companies flag affordability as a high-risk factor

This interviewee also pointed to the looming costs of paying for the net-zero transition, which heightened the risk of more customers not being able to pay their bills.

"I think there is now a major affordability problem. What is fair in a market where you're providing a service that's essential for daily life?"

This was not a view shared by all interviewees. One commented: "It's probably fair to assume that you're going to have a higher proportion of customers entering debt journeys, but how things will pan out is an unknown right now."

One interviewee from the commercial retail sector said that companies in that sphere were also at risk of non-payment when fixed-term deals came to an end over the course of this year.

For network companies the risks clearly are not as great, but affordability is still rated by more than six out of ten (63%) as a high-risk factor and 56% pointing to it having a high impact on the business.

Explaining why affordability is a problem for networks, one network director said: "If suppliers go under, part of the cost they have collected is recovered by the network companies, but they recover it the following year. Given it runs into millions of pounds it can affect credit and cash flow. And we will own some of the gas – and will be exposed there as well."

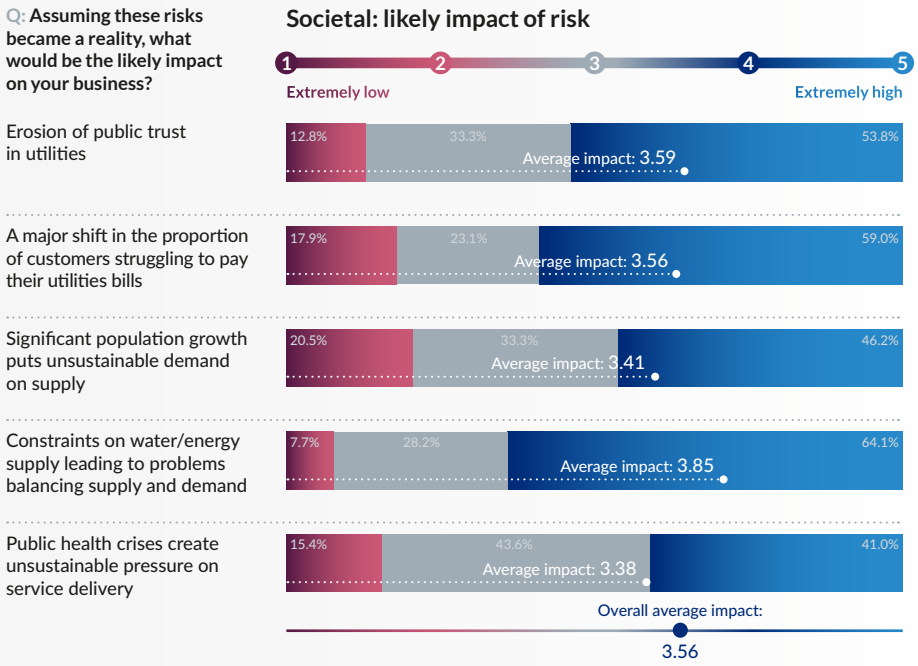
Q: How likely are the following to become a risk factor over the next five to 10 years? % likely / extremely likely to become a risk	Overall	Energy networks	Energy retailers	Water companies
Erosion of public trust in utilities	**69.2%**	75.0%	75.0%	58.3%
A major shift in the proportion of customers struggling to pay their utilities bills	**56.4%**	62.5%	87.5%	25.0%
Significant population growth puts unsustainable demand on supply	**30.8%**	12.5%	12.5%	66.7%
Constraints on water/energy supply leading to problems balancing supply and demand	**53.8%**	37.5%	50.0%	75.0%
Public health crises create unsustainable pressure on service delivery	**12.8%**	18.8%	0.0%	16.7%

Water and affordability

The levels of concern over affordability were much lower for the water sector – no doubt because bills are only quarterly and significantly lower compared with energy. That said, half of those responding from water companies said it would have a high impact on the business if more customers were unable to pay their bills.

Erosion of trust

Seven out of ten (70%) of survey respondents rated erosion of trust as a high-risk factor, with just over half (54%) saying it would have a high impact on their business were it to become a reality. On the energy side it was felt that the collapse of so many domestic suppliers had eroded trust. But that could be ratchetted up in future as consumers turn to third party intermediaries (like price comparison sites) to provide net-zero services. While energy companies were highly regulated, third-party intermediaries had little control over the way they operated, which it was felt could undermine trust if they failed to deliver what they promised. Water rated erosion of public trust lower (58%) despite the plethora of negative headlines regarding combined sewer overflows and gave the same risk score for the impact it



Q: Assuming these risks became a reality, what would be the likely impact on your business? % high / extremely high impact on business'	Overall	Energy network	Energy retailer	Water companies
Erosion of public trust in utilities	**53.8%**	56.3%	50.0%	58.3%
A major shift in the proportion of customers struggling to pay their utilities bills	**59.0%**	56.3%	87.5%	50.0%
Significant population growth puts unsustainable demand on supply	**46.2%**	50.0%	12.5%	66.7%
Constraints on water/energy supply leading to problems balancing supply and demand	**64.1%**	62.5%	62.5%	75.0%
Public health crises create unsustainable pressure on service delivery	**41.0%**	43.8%	37.5%	41.7%

would have on business should it become a reality. In the water sector 58% scored erosion of public trust in utilities as high or extremely high impact, compared with the average score of 54%.

Water supply and demand

For water companies the biggest risk in the societal category was the constraints on supply leading to balancing supply and demand, where 75% of water companies rated it a high risk for likelihood and a high impact on the business.

The UK population, which was estimated to be 67.1 million in mid-2020, is projected to rise by 2.1 million to 69.2 million over the decade to mid-2030, according to government statistics. In water-stressed areas of the country, the risk was felt acutely, with interviewees concerned at tight constraints on levels of investment.

Water companies were also concerned about the supply of energy and other resources and the impact that would have on their businesses if shortages continued to push up costs.

One water company director said: "We can't handle the energy price rises that are being given to us by the energy sector, they are nowhere near offset by the income that we have. So, if we continue with other blips like that, then the attractiveness for our owners is significantly dented. And there's nothing that we can do to control that.

"It's not like we're running inefficient operations, we really are looking every day to see how we can salami slice that further. But I feel we're at a point where we have no fat left."

ENVIRONMENTAL RISKS

3

Water

Extreme weather is the scourge of the water sector, with floods, drought, extreme cold and extreme heat all testing the network to the limits of its resilience and regularly showing them wanting. Having seen the havoc that extreme weather can have, and the predictions it will occur more frequently, it's hardly surprising that all (100%) respondents from water said that extreme weather was a high-risk factor and that it would have a high impact on their business. Clearly, it's already doing so.

What is most occupying the thoughts of those in the sector is how quickly they can mitigate the effects of climate change by boosting resilience, and this will require huge investment. Even dealing with discharge of sewage into rivers and bathing waters as a result of combined sewer overflows, which both government and the public are demanding should be tackled, could cost billions of pounds over a number of years. Assets are ageing and need to be upgraded and new systems for storing water need building.

"Anything is possible," said a section head for a water company, "but it costs money and no one knows how that will pan out given the need for low water bills which have fallen in real terms."

In the case of future increased risk of flooding, the good news is that guidance is now available

for companies seeking to adapt and embrace resilience through DEFRA's Property Flood Resilience Code of Practice.

Resilience measures are also being championed by the insurance sector through initiatives such as Marsh's Placement Plus policies, which allocate funds for resilient recovery should the worst come to pass.

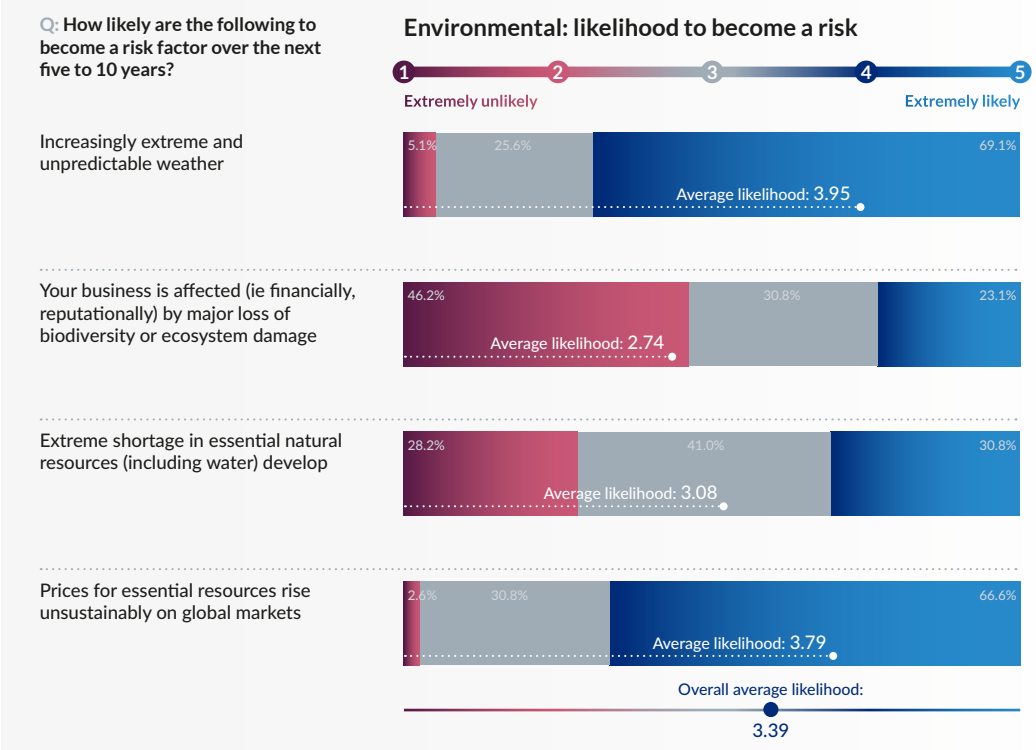
Marsh is seeing increased interest in pre-loss risk assessment for natural hazard risks as well as focus on resilient infrastructure and insurance innovations, according to Carl Ratcliffe, industry practice leader, Marsh.

An operations director at a water company agreed: "We're definitely getting more extremes of weather, which impacts the operation, whether that's flood impacting your assets or whether that's a hot period with excessive demand, or whether that's storms that disrupt the power supply.

"It is absolutely vital that companies have the right investment plans for improving resilience. But I think the timelines for those plans will need to be brought forward because we are getting these extremes of weather much more frequently now than we ever thought we would.

"A lot of the solutions to these problems are new infrastructure projects, which take time to do. The next AMP is a real challenge for us."

50%
of water companies flagged up extreme shortages in natural resources as a high-risk factor



The director said there needed to be a more standardised approach to mains renewal rates to reduce risks, rather than basing these on historic factors as happens currently. But again, this would take big money.

Changes to the climate, coupled with population growth, is also creating risk factors around water shortages, particularly in the south and east of the country. Half of those from water companies (50%) flagged up extreme shortages in natural resources as a high-risk factor. "More water will be needed, but then water companies have to balance that against directives from the Environment Agency to reduce abstraction. However, customers are not very aware of the issue and more needs to be done to curb water usage – for example water efficiency is still not a component in the building regulations.

"It's about getting the balance right between demand reduction and leakage and new resources and more resilience. And that's going to be a key risk, if we don't get that balance right."

One water interviewee put it very starkly: "The major concern on mitigating these risk factors is being able to upgrade existing assets. Across the whole sector, our assets have been underinvested in now for a long time. And we are going to pay at some point, or else there's going to be a disaster. Some of the fixes that we have to put in place on plants that are doing a really vital job is unbelievable. And it's not just us. It'll be across the whole sector. So, I think that our infrastructure is definitely a massive, massive risk to the resilience of our service moving forward." The interviewee said, however, that all water companies were "working incredibly hard to meet the 50% reduction target".

Assessing the materiality of climate and environmental risks through physical and transition scenario modelling is one of the key activities water companies must undertake, according to Dr Bev Adams, Head of Climate Resilience and Strategy. Once the size of the risk and the timescale for onset has been modelled, boards can evaluate the cost-benefit of adaptation and resilience measures and prepare their net zero plans with confidence that they are proactively making balanced decisions about what and when to make critical investments.

Q: How likely are the following to become a risk factor over the next five to 10 years? % likely / extremely likely to become a risk	Overall	Energy networks	Energy retailers	Water companies
Increasingly extreme and unpredictable weather	69.2%	62.5%	37.5%	100.0%
Your business is affected (ie financially, reputationally) by major loss of biodiversity or ecosystem damage	23.1%	18.8%	25.0%	25.0%
Extreme shortage in essential natural resources (including water) develop	30.8%	18.8%	12.5%	50.0%
Prices for essential resources rise unsustainably on global markets	66.7%	81.3%	75.0%	41.7%

Energy networks

Like water, extreme weather has battered the power networks and only looks set to get worse. More than six out of ten (63%) rated extreme weather as a high risk with a similar number saying its impact on their business is high. Storm Arwen at the end of November 2021, in the north-east of England and parts of Scotland caused the biggest disruption to power supplies since 2005, leaving a million homes without electricity, some for more than a week. It raised questions about the energy companies' attention to infrastructure, the speed with which they restored power, and their communications with those affected.

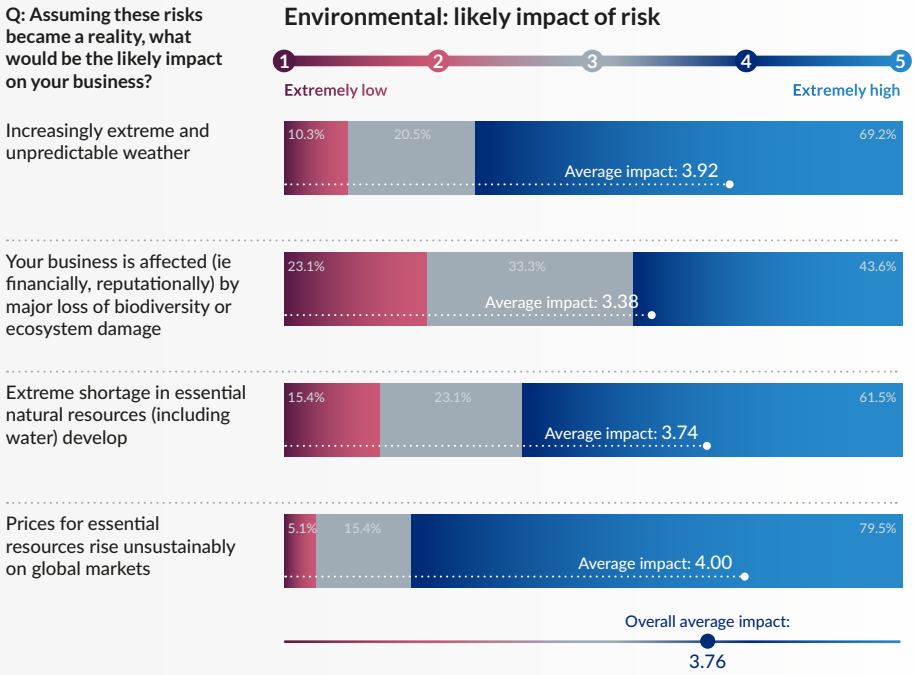
Going forward the debate is how resilience can be boosted, with investment a key factor. Said one interviewee: "The Western Isles and Shetland get wind speeds in excess of 100 miles per hour several times a year and the electricity infrastructure survives incredibly well in these sorts of conditions. There's no problem, because they've got a higher design specification and they don't have trees. If you deal with trees, and deal with the design specification of your network, you can deal with it.

"If you really want to go the whole hog, you do what Denmark did and put your entire network underground, which they did 20 years ago after a storm caused huge disruption. But that that does affect bills. And there may well be an argument for saying that if are making all this investment in low carbon technologies why not invest a bit more and make all new circuits automatically underground to bake in greater resistance for the long term?"

They added: "But that doesn't seem to fit in with the DNO ED2 plans at the moment, because all the drivers are the opposite, ie keeping costs down."

While gas distribution has not been disrupted by extreme weather, the changing and unpredictable climate brings other risks to gas businesses in terms of predicting supply and demand as winters have gone from having longer cold spells to burst of more extreme weather followed by a few milder days.

Q: Assuming these risks became a reality, what would be the likely impact on your business? % high / extremely high impact on business	Overall	Energy networks	Energy retailers	Water companies
Increasingly extreme and unpredictable weather	69.2%	68.8%	37.5%	100.0%
Your business is affected (ie financially, reputationally) by major loss of biodiversity or ecosystem damage	43.6%	43.8%	25.0%	50.0%
Extreme shortage in essential natural resources (including water) develop	61.5%	56.3%	25.0%	91.7%
Prices for essential resources rise unsustainably on global markets	79.5%	100.0%	62.5%	75.0%



Materials resource

With prices spiralling upwards for energy as the survey and interviews took place, the impact on businesses was already taking its toll. Overall, the likelihood of this happening was rated high, with two-thirds (67%) saying that it was extremely likely or likely to become a risk factor. For energy networks and energy retailers these percentages were higher, 81% and 75% respectively. In terms of impact, eight out of ten rated the impact it would have as high or extremely high.

The risks were not linked to energy prices, but other materials where companies were exposed to global markets, including construction materials like plastic piping.

The rise in cost of essential resources was rated as a lower risk factor for water companies (42%) but the impact much greater (75%).

4

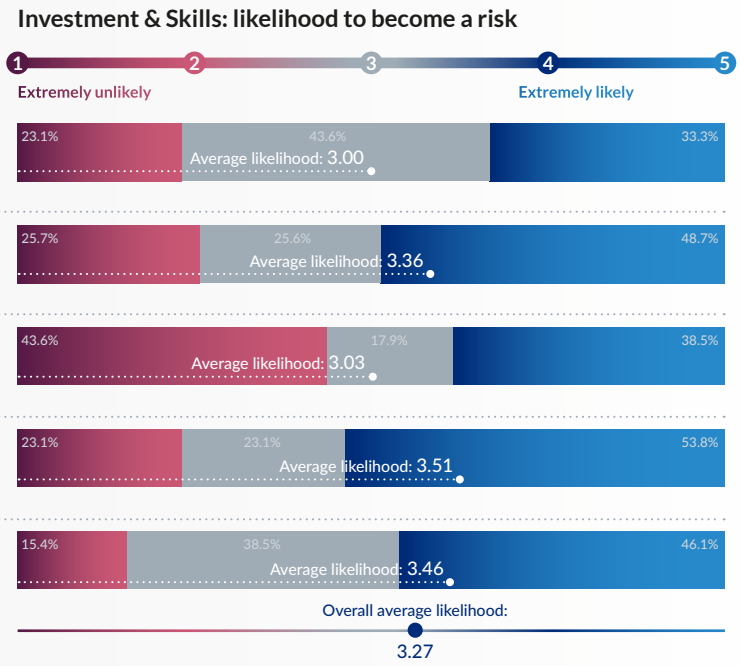
INVESTMENT AND SKILLS RISKS

Skills gaps

With so much change in energy and water going forward as the sectors look to move to net zero, improve customer relationships and digitalise their operations, concerns inevitably emerge about whether companies have the skills needed to deal with the ambitious tasks at hand. Nearly half (46%) rated as a high risk utilities not being able to keep pace with changing skill sets; a higher number (56%) said the impact on their business would be high if it became a reality. The overall average scores were 3.5 and 3.6 respectively, higher than the average score for risk factors to do with investment.

Gaping skill deficiencies in data analytics and artificial intelligence were regularly cited by those interviewed, along with concerns over the challenges to be posed by quantum computing and other emerging technologies. Some interviewees wondered if there would be enough skilled people to install the 600,000 domestic heat pumps a year that the prime minister wants between now and 2028. Ditto, upgrading millions of homes to boost energy efficiency. With so much infrastructure being built, a shortage of engineers will surely be evident sooner than later.

Q: How likely are the following to become a risk factor over the next five to 10 years?



75%
of water companies said that skilled workers would be enticed away from the sector

Concern high among water companies

There was a high degree of concern (54%) that skilled workers would be enticed away from the sector – a particular worry among those working at water companies (75%) who took part in the survey. Water companies also rated it a high risk that young people would not see the sector as an attractive career path.

A sector chief in one water company pointed to the industry's "invisibility".

They commented, however: "I'm hoping this that will change as the attractiveness of green jobs improves, because realistically, we're the green job sector.

"But the skills required if you're a data analyst, and you're being offered a six-figure salary in London versus a job at half that working for a water company with the same skills, it's a bit of a no-brainer as to which way you're going to flip. However, I don't think it's insurmountable if we give it the attention that's required. Because I think that this is an attractive sector, we just haven't done the legwork to make it appear that way."

An operations director of another water company said that the five-year control period could count against the sector in recruiting and training staff. "In the event of an economic downturn and low inflation and when it's an employers' market, the fixed five-year period is a real buffer for the water industry. But the flip side is when you have as we do now, runaway inflation and it's an employee's market, that five-year period is a shackle.

"We can't suddenly say, oh, let's up everyone's salaries. It's been a very stable economic situation for a number of years, but what we're seeing now is it's a real challenge.

"It may be short-lived and level out again in a couple of years, but it is definitely a concern at the moment."

This interviewee also suggested that the sector needed a different careers outlook as well. "The water industry historically has relied on people staying in the company and in the industry for a long time and carrying that knowledge through. These days people don't have jobs for life and they may change career a number of times. We've definitely got to change our approach to career longevity, and we're trying to do that."

Some in the water sector were more optimistic: "We're investing a lot in people today with extensive graduate and apprenticeship programmes and we have got a lot of innovation coming down the line. That said, some of assets will be the same in 100 years' time. That type of engineering is not necessarily going to change, though the interface will, so I don't think skills shortages will be a major issue."

Q: How likely are the following to become a risk factor over the next five to 10 years? % likely / extremely likely to become a risk	Overall	Energy networks	Energy retailers	Water companies
Investors view your sector as too risky	33.3%	43.8%	37.5%	16.7%
Investors view returns as too low in your sector	48.7%	68.8%	62.5%	25.0%
Young people do not see the sector as an attractive career path	38.5%	37.5%	25.0%	58.3%
Skilled workers are enticed away from the sector	53.8%	56.3%	37.5%	75.0%
The industry fails to keep pace with the demands for changing skillsets (i e digital)	46.2%	56.3%	37.5%	41.7%

Networks skills risks

Network operators were more confident of attracting people into the sector, with fewer than four out of ten (39%) viewing recruitment as a high risk. To a certain extent perhaps the rather less concerned outlook may be to do with the fact that DNOs tend to provide the training ground for the rest of the industry. "We train people, they finish their training, and they disappear, often to the private unregulated companies, that can pay higher salaries. Because of the way we are regulated we can't be as agile," said one network operator.

However, the overwhelming majority of network operators (94%) said the impact on their businesses would be higher if skills shortages materialised – much higher than water. There was particular concern about the stiff competition of competing for construction and engineering expertise.

One network director commented: "Labour is a competitive market in terms of infrastructure, particularly when we've got big, large-scale investment programmes, such as mains replacements. People go where the highest salaries are. It's been made even more competitive with Brexit."

The director also pointed to the need to build new capabilities for working with hydrogen and transforming a network from one gas to another. "It's not something that's been done since town gas was changed over to natural gas in the 1970s. We're looking at training centres, and academies to develop that skill as an industry, which is a great opportunity for the UK."

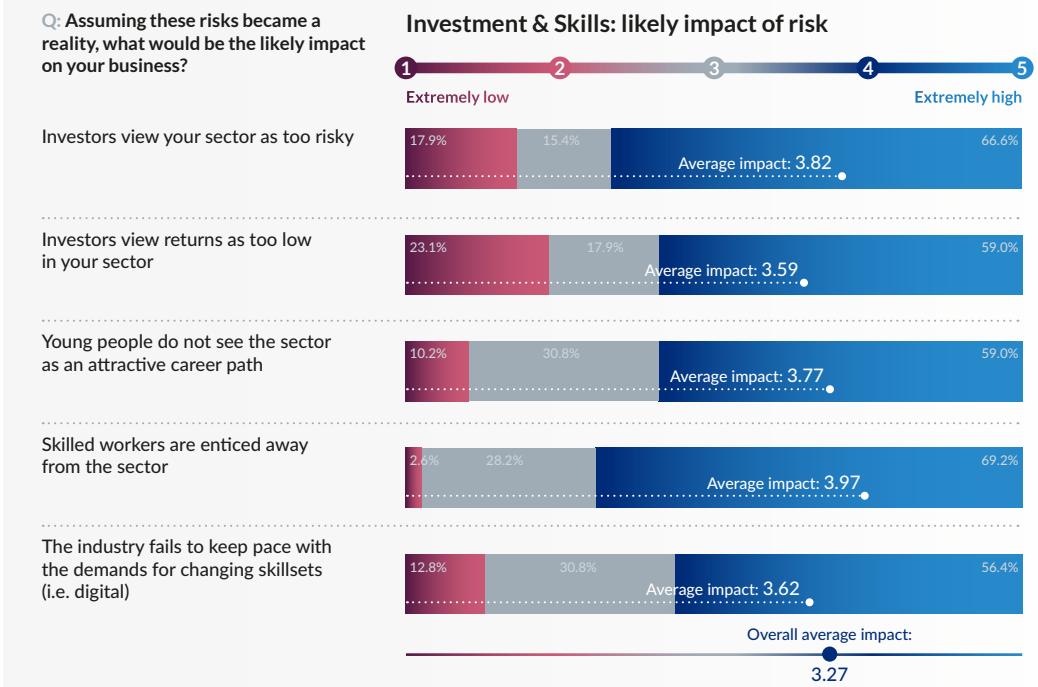
Another director observed the challenges ahead - and the opportunities. "When you look at all there is to do in the next 20 years, the skills and workforce is going to be a major challenge. That is something that networks can mitigate, but there is always the risk you won't do enough. You can't train up thousands and thousands of people to install heat pumps, say, if nobody's currently buying them, can you?"

As the energy sector transitions, then decommissioning of older assets also becomes more prevalent, which again will require a boosting of skills to ensure safe operating.

Investment risks

The attractiveness or otherwise of utilities to investors was not seen as a particularly high-risk factor to survey respondents. Overall, only a third (33%) rated it as a high-risk factor. And slightly less than half (49%) rated "investors view returns as too low" as a high risk. "Investors view your sector as too risky" received an average risk factor score of 3 out of 5; while "investors view your returns as too low" received an average score of 3.4.

Given the turmoil in energy retail, and the fact that price reviews in energy and water are likely to see lower rates of return, one might have expected these to be scored more highly. The fear that the sector is becoming unattractive to investors is a common refrain – yet no companies have failed yet to find willing investors.



Ofwat is starting to gear up for the next price review in water for the period 2024-29, and Ofgem has negotiated the price review for the electricity and gas transmission operators which runs from 2021-26. The price control for distribution networks runs from 2023-28.

For both of these price controls, our interviewees stressed the need to balance risk and rewards. Energy costs, construction costs, materials costs and potentially salary inflation all add uncertainty to projected returns on investment.

The survey showed energy networks to be the most concerned group of those surveyed (69% view investors considering returns too low as a high risk), a view that was borne out in the interviews. A regulatory expert with a gas network said that, next to uncertainty over policy development, the risks around poor returns for investors were another significant risk factor.

Energy retail did not score these risks so highly in terms of likelihood, but it could well be that those who took part in the survey had large corporations behind them who were in it for the long term. Said one: "If you're a retailer, where you don't have an established investor, that could be seen as a risk. But then, equally, I think there's almost the inverse risk, in that as prices fall, people could see it as a particularly attractive market to enter because they could undercut those existing companies that have hedged at a high price and who would therefore be limited in terms of offering cut price deals to consumers."

17%
of water companies said investors view the sector as too risky

Q: Assuming these risks became a reality, what would be the likely impact on your business? % high / extremely high impact on business	Overall	Energy networks	Energy retailers	Water companies
Investors view your sector as too risky	66.7%	87.5%	75.0%	41.7%
Investors view returns as too low in your sector	59.0%	75.0%	50.0%	50.0%
Young people do not see the sector as an attractive career path	59.0%	75.0%	25.0%	50.0%
Skilled workers are enticed away from the sector	69.2%	93.8%	50.0%	50.0%
The industry fails to keep pace with the demands for changing skillsets (i e digital)	56.4%	68.8%	50.0%	58.3%

Water companies marked investor risk much lower than did energy networks and retail. Less than a fifth (17%) said investors view the sector as too risky; and a quarter (25%) said that "investors view returns as too low" as a high-risk factor. As entities, water firms are able to predict their income for years in the future, and even with a lower rate of return than some infrastructure sectors, are seen as a good match with pension funds, a number of which have stakes in the sector. That said, one CEO of a water company interviewed for the report said they were surprised by the result. The fact that four water companies had appealed to the Competition and Markets Authority following Ofwat's last price determination for PR19 was a strong indicator that investors were viewing returns as too low. And with pressure to keep bills down in PR24, the CEO thought that the returns would be kept low.

The uncertainties brought about by climate change and more regular incidence of extreme weather is also adding to the uncertainty of returns. The disruption to the business and the costs associated with dealing with severe weather conditions have become material, said a senior manager at a water company. The interviewee commented that greater regulatory risks were being placed on water-only companies; because of the way performance outcomes were measured, the water outcomes incurred more penalties than sewerage-related Outcome Delivery Incentives (ODIs).

COMMENT

Dan Blobaum
Operations Director, **Mercer Energy**

As evidenced from the Utility Week research, forecasted risks regarding the utility industry's ability to recruit and retain a skilled workforce (both in likelihood to occur and potential impact) are high. While the respondents were fairly evenly split (.9x likely versus unlikely) regarding whether young people would not view the sector as an attractive career path, the group strongly believed that skilled workers would be enticed away from the sector (2.3x) and that the industry would fail to keep pace with the demands for changing digital skillsets (3.0x). The projected impacts are even more concerning with only 3%-13% rating each of these risks as low or extremely low, 28%-31% as medium and 56%-69% as high or extremely high.

In other industry research (Mercer's 2022 Global Talent Trends – Energy), one-third of energy HR leadership respondents reported that the biggest barrier to their reskilling/upskilling agenda is the belief that newly skilled workers will leave their firms. This concern appears to be well-founded by the Utility Week research.

Specific skill sets identified by participants in the Utility Week risk research as being particularly difficult for the industry to recruit over the next 5-10 years were largely STEM-based (e.g., data scientists, technology experts, engineers) but also included experienced field and operational roles. Given the demand for digital and STEM-based talent across all industries and the lucrative packages some high-profile companies are offering, it is vital for the utilities industry to identify and address their skill gaps now against future requirements and invest in reskilling and upskilling programs. Revisiting employee value propositions (including compensation, total rewards, inclusive benefits, flexible working, etc.) and addressing employee engagement, diversity, equity and inclusion and environmental, social and governance and culture will also be critical for utilities to attract and retain the talent required now and in the future.

DIGITAL AND SECURITY RISKS

5

Cybersecurity and other threats

Cybersecurity came out top as the biggest risk to utility firms, taking into account the likelihood of firms suffering a cybersecurity breach and the potential impact on the business. Nearly eight out of ten (77%) regard a serious cybersecurity breach as a high-risk factor and 85% said that this would have a major impact on the business. The average score for these risks factors was 4 and 4.3. The results of the survey were backed up by the interviews. With government warnings of cyber-attacks being issued to critical infrastructure organisations as tensions with Russia began to escalate, this risk was clearly front of mind.

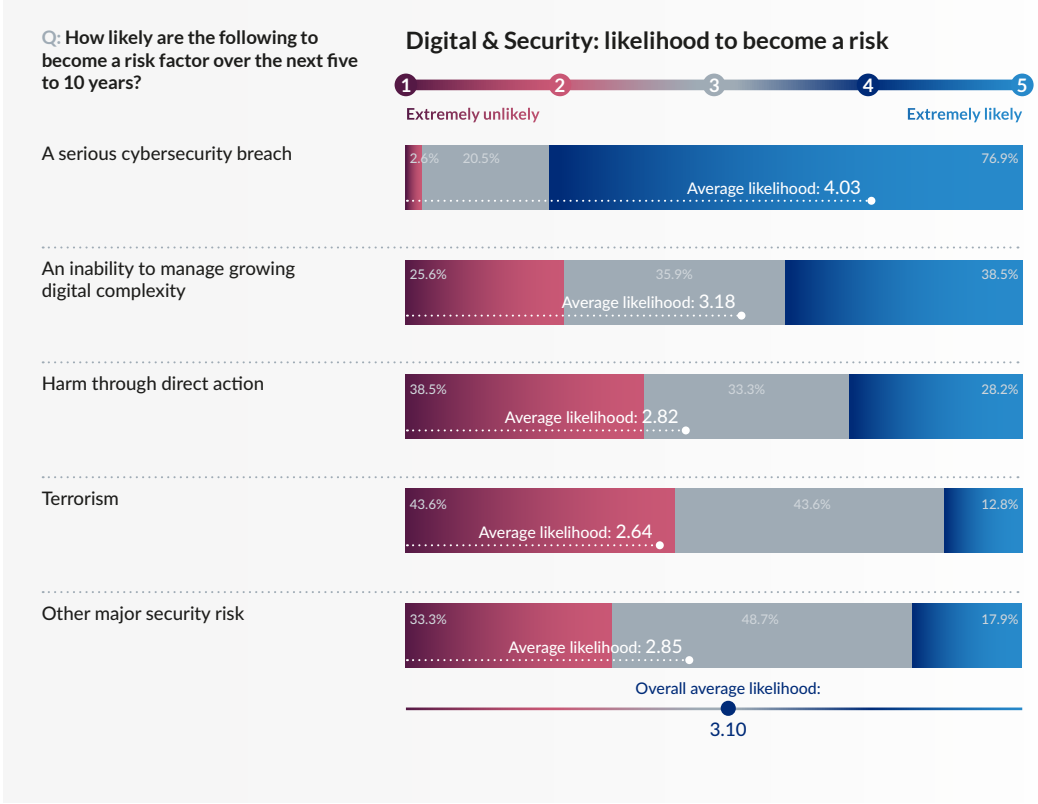
One network's digital director said: "Hardware and software is the big security risk. And the range of risk is enormous; we hold lots of customer data and we wouldn't want to lose that. Hacking into data could see the lock down of our system and make it difficult to operate. That's the biggest fear – a lockdown of our systems and that we end up losing visibility."

Interviewees said that utilities were prone to the type of ransomware attacks that corporates across the board were being subjected to, with breaches in some cases being triggered just by clicking on a rogue email. Clearly, for utilities the impact was heightened

because energy and water companies provide essential services to customers.

It was felt that breaches of cybersecurity would only continue to grow as a risk factor as operations became more digital, and a large number of digital devices (like sensors) were added to networks. The director of a gas network commented: "I think it is becoming increasingly important that any of these digital interfaces with your assets is one thing to scrutinise. Another thing is the consequences of losing supply and the reliance that there is on digital solutions, both in terms of communication and in getting the system back up and running. That's something we're having to think about as well."

A retailer concurred: "We're ultimately building a system in the future that is more exposed to cyber breaches because of coordinating activities on the demand side. There's lots of new routes in that we don't have control over that can ultimately result in attack on the electrical network."



63%
of energy retailers viewed a serious cybersecurity breach as a high-risk factor

A section head at a water company echoed these sentiments. "Breaches of cybersecurity is at the very top of our risk list. And really this is down to the growth of and accessibility of sensors and IoT [Internet of Things] devices, which we desperately need for our business to boost visibility of how well our operations are functioning.

"But what we're seeing is that the sensor companies all have their own platform held in their own cloud. It ends up so that your data is scattered everywhere. And unless you have really, really careful governance around you, and have a strategy on how you're going to manage all of this, it could get very messy, and especially at the innovation end, when trying new things.

"We have a very active cybersecurity department; we have the right. governance controls over what we're doing and there is a high chance of us mostly being able to manage that risk. But it needs investment and resource to give it the proper due diligence and to keep pace with the speed of change."

Turning to energy retail, six out ten (63%) viewed a serious cybersecurity breach as a high-risk factor, and the same number said it would have a serious impact on their business. The threat here was around information being stolen. One retailer said they were surprised that the risk was not scored more highly, particularly with the rollout of smart meters, which although governed by stringent security

controls could still potentially provide another entry into the network.

However, one interviewee from retail provided a different viewpoint. They thought it was surprising that the impact had been rated so highly, particularly where impact on the business was concerned.

"I can understand why the issue of cybersecurity is both high risk and high impact for energy infrastructure, because it would have a material impact, or you can have a malicious actor that's trying to shut down parts to the grid that would cause absolute chaos. But for a retailer, the obvious security risks are a bit different, because really, we're thinking about a loss of personal data.

"But even in that scenario where there has been a cyber breach and some customer data, which, frankly, is the most valuable data that we hold, has been breached, primarily it's more of reputational risk, and it's a question of how your customers then react to the fact that you are not careful enough with their data.

"I think it's as significant as some of the other risks that a retailer is facing. But for me, much more fundamental and the concern I would put first, is whether customers can afford to pay their bills or not."

Q: How likely are the following to become a risk factor over the next five to 10 years? % likely / extremely likely to become a risk	Overall	Energy networks	Energy retailers	Water companies
A serious cybersecurity breach	**76.9%**	75.0%	62.5%	83.3%
An inability to manage growing digital complexity	**38.5%**	37.5%	25.0%	50.0%
Harm through direct action	**28.2%**	43.8%	25.0%	8.3%
Terrorism	**12.8%**	12.5%	12.5%	0.0%
Other major security risk	**17.9%**	25.0%	12.5%	8.3%

Regulation and cybersecurity

Concern was voiced that the regulatory burden around cybersecurity was unhelpful and unnecessarily bureaucratic, and so too the regulatory culture.

The digital director of a network set out what they saw as the problem: "Regulators tend to take a punitive approach based on fines and penalties.

"It's not helpful to share best practice, which tends to be about learning from mistakes, as no one wants to admit to those because of the fear of getting penalised. The key is having an open culture – the fines and penalties are driving the wrong behaviours, which in turn is adding to the risk."

Another difficulty flagged up was the need to forecast cybersecurity spending over five-year price reviews: the situation changes on a monthly basis, said one, and therefore doesn't align with the funding model.

There was, however, confidence that the increased risks and need for more investment were being taken into consideration by regulators, given allocation for cybersecurity spending was increased in the RIIO-D2 network price control. This sets out what the gas distribution network companies were expected to deliver for energy consumers from 2021-26.

Other security threats

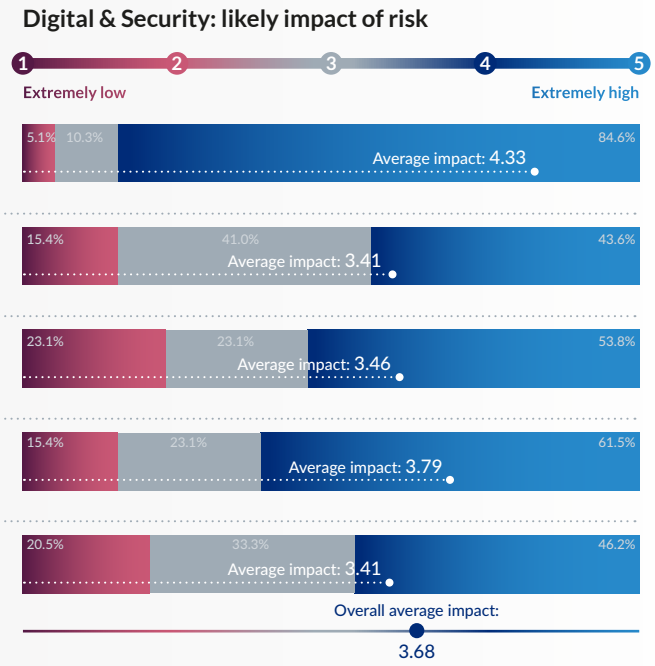
Energy network respondents were almost twice as likely (44%) to rate harm through direct action as a high risk compared with other sectors (25% retail and just 8% water), the reason being that most assets are above ground, compared to underground for water.

Those looking to cause harm to a utility might find it easier to cut down a tower pole or attack a substation, which according to one respondent would be made easier with open data as it would enable them to pinpoint where they could do the most harm.

The network operator acknowledged, however, that trying to stage such as act of vandalism or worse has not been something that has been happening with intent to disrupt or harm. "Most of the attacks we have at the moment are theft orientated," they said.

Water companies, meanwhile, felt that although in theory it would be possible to poison water supplies, its impact would be very localised, hence perhaps the reason why no respondents from the water sector scored terrorism as a high-risk factor, though should it become a reality, the impact would be high. Almost seven out of ten (67%) said it would have a high or extremely high impact on their business.

Q: Assuming these risks became a reality, what would be the likely impact on your business?



Q: Assuming these risks became a reality, what would be the likely impact on your business? % likely / extremely likely to become a risk	Overall	Energy networks	Energy retailers	Water companies
A serious cybersecurity breach	**84.6%**	93.8%	62.5%	83.3%
An inability to manage growing digital complexity	**43.6%**	50.0%	25.0%	41.7%
Harm through direct action	**53.8%**	81.3%	25.0%	33.3%
Terrorism	**61.5%**	75.0%	37.5%	66.7%
Other major security risk	**46.2%**	68.8%	12.5%	41.7%

Digital complexity

An inability to manage growing digital complexity was rated as a high-risk factor by almost four out of ten all respondents (39%), with the highest score coming from those in water (50%). Issues flagged up in interviews included fears over having the right skills and the move to open data.

Interviewees pointed to demand outstripping supply of those with digital and cyber skills and data analytics. "We are seeing a much higher level of churn – last year we lost over half those in our data analytics department," reported one interviewee.

Regulation and digital funding

One issue that arose during conversations with respondents was that regulation and IT investment were not natural bedfellows. This was raised under the need for investment for cybersecurity, but as an issue it was seen as wider than that, and could potentially add to the difficulties of managing digital complexity. Again, that is because five-year funding periods don't necessarily match the pace of change, but also investment spending is calculated on what has gone before as opposed to what might be needed in the future.

Said one network director: "The funding model for IT investment is not right. What I need to provide to Ofgem is a very, very detailed investment case and business plan that does not lend itself to digital innovation.

"Another important factor is the funding for IT comes under capital investment. There is no common set of operational investments for aspects things like developing skills or developing services."

COMMENT

Delvin Tillet
cyber placement specialist, **Marsh**

The digitalisation of the utilities sector, particularly energy infrastructure, which previously used closed standalone Industrial Control Systems (ICS), has been replaced by Supervisory Control and Data Acquisition (SCADA)

These systems are built on openness and interoperability. Internet-of-Things appliances, such as interconnected sensors and instruments, vastly increase the attack surface for such organizations, with threat actors targeting Operational Technology (OT) and Industrial Control Systems (ICS).

Clients are increasingly concerned with the prospects of physical damage resulting from cyber events. This has been driven predominantly by the "Silent Cyber" initiative by regulators such as the Prudential Regulation Authority and Lloyds of London requiring insurers to remove "Silent Cyber" from policies and either affirm or exclude cyber risks.

CONCLUDING REMARKS

From cybersecurity, to climate change, to pressures on affordability and the squeeze on skills and resources, there are huge challenges and giant risks facing the sector. It's clearly troubling times, and those interviewed only expected life to get tougher.

Asked if they were confident of managing and mitigating the most significant risks, six out of ten stated that they were, although 54% said this confidence was dependent on building significant new or extended capabilities.

Such dependency makes sense. As the research and the follow-up extended interviews have underlined, so much of what water and energy companies do is linked to other factors. That's not to say that improving operations, better planning, staff training and greater use of innovation and IT is not under their gift. But our interviews made the point that so much of risk mitigation comes down to weighing up the risk versus costs. Is it worth it, can customers afford it?

Q: Overall, how confident are you that your organisation will be equipped to manage and mitigate the most significant risks you believe it will encounter on a 5-10 year horizon? To what extent does this confidence depend on building significant new or extended capabilities in your organisation within the next five years?

% high / extremely high (ranked 4 or 5)

	Overall	Energy networks	Energy retailers	Water companies
Confidence in being equipped to manage and mitigate the most significant risks	**61.5%**	62.5%	75.00%	50.0%
Confidence dependent on building significant new or extended capabilities	**53.8%**	75.0%	25.0%	50.0%

As was pointed out many times, regulatory constraints reduce agility when it comes to increasing salaries to keep staff or investing in the latest technology. And the biggest areas of risk mitigation will require massive decisions by regulators and government. For example, networks can mitigate against disruption caused by storms and almost eliminate it entirely if design specs were boosted to those used to build networks on the windswept Scottish Isles, or they were able to lay cables underground, the approach taken in Denmark. But like all the tough choices that need to be made, the question is, can it be paid for?

Top risk factors by sector

In terms of sector specific risk factors – these were the ones that received the highest scores in terms of likelihood of happening and impact on the business by sector:

Sector	Likelihood of risk being high or extremely high	Impact on business being high or extremely high
Energy networks	1 Regulation does not adapt quick enough to match the demand on utilities (88%) 2 Investors view your sector as too risky (88%) 3 Prices for essential resources rise unsustainably on global markets (81%)	1 Prices for essential resources rise unsustainably on global markets (100%) 2= Policy does not develop fast enough to enable utilities to invest (94%) 2= Skilled workers are enticed away from the sector (94%) 2= A serious cyber security breach
Energy retail	=1 A major shift in the proportion of customers struggling to pay their utilities bills (88%) =1 Policy does not develop fast enough (88%) =3 Regulation does not adapt quick enough (75%) =3 A political backlash emerges (75%) =3 Erosion of public trust in utilities (75%)	1 A major shift in the proportion of customers struggling to pay their utilities bills (88%) =2 Investors view your sector as too risky (75%) =2 Policy Does not develop =2 Fast enough (75%) =2 Government directly intervenes around affordability (75%) =2 The renationalisation of some segments of the utilities sector gains political and public momentum (75%)
Water	1 Increasingly extreme and unpredictable weather (100%) 2 Serious cyber security breach (84%) =3 skilled workers are enticed away from the sector (75%) =3 Constraints on water supply leading to problems balancing supply and demand (75%)	1 Increasingly extreme and unpredictable weather (100%) 2 Extreme shortage in essential natural resources develop (92%) 3 A serious cyber security breach (83%)

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