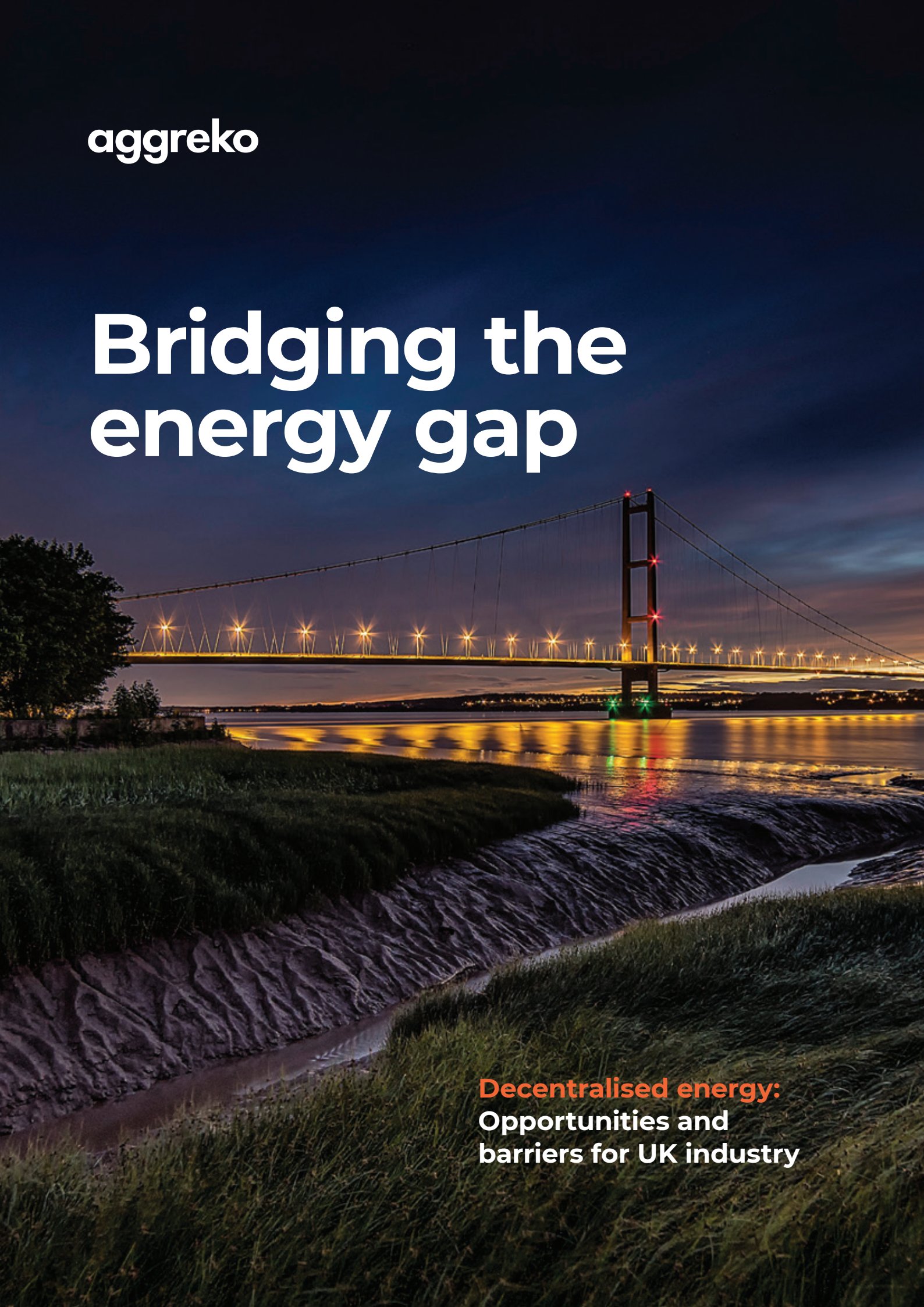
aggreko

Bridging the energy gap

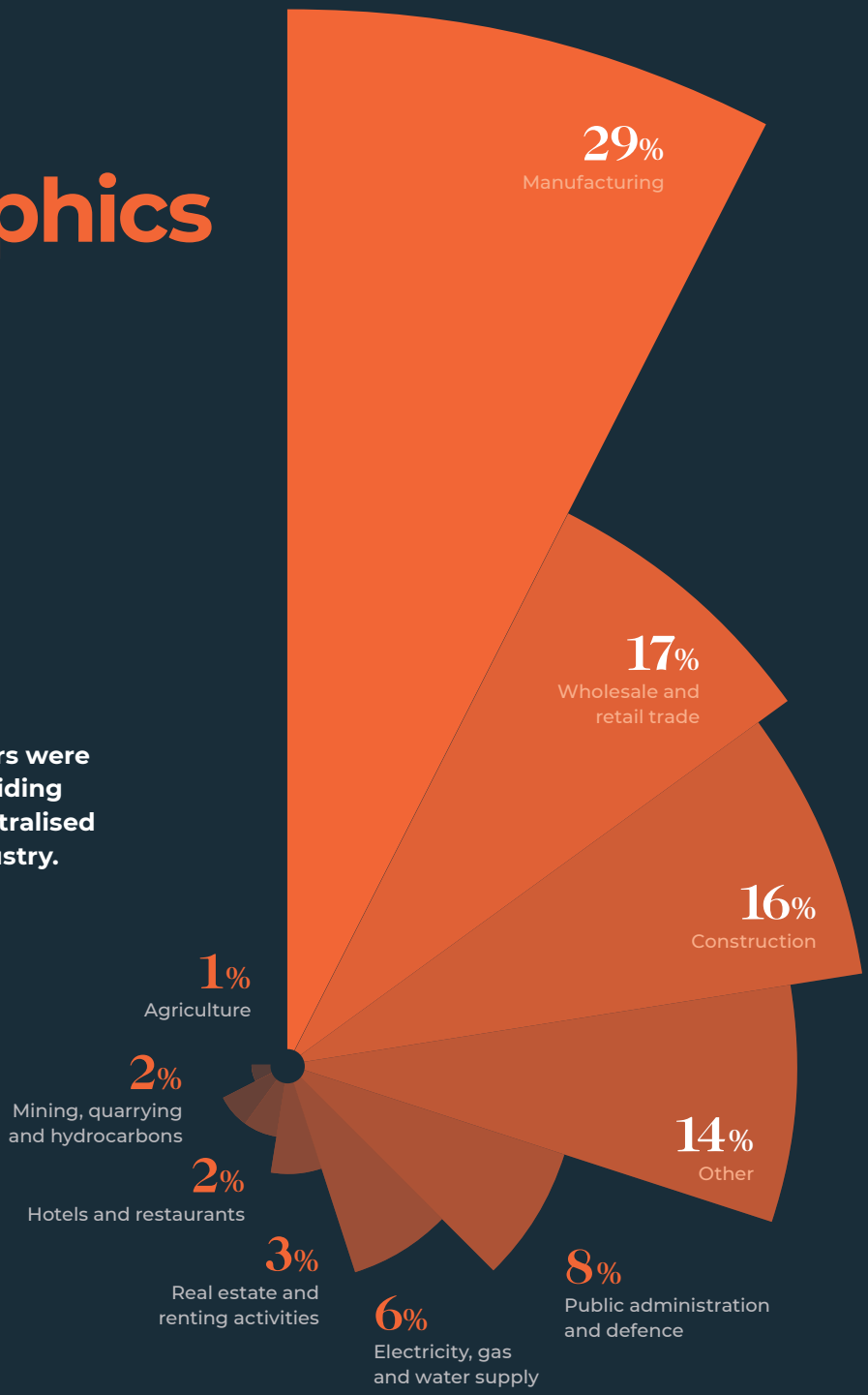


Decentralised energy:
Opportunities and barriers for UK industry

Research demographics

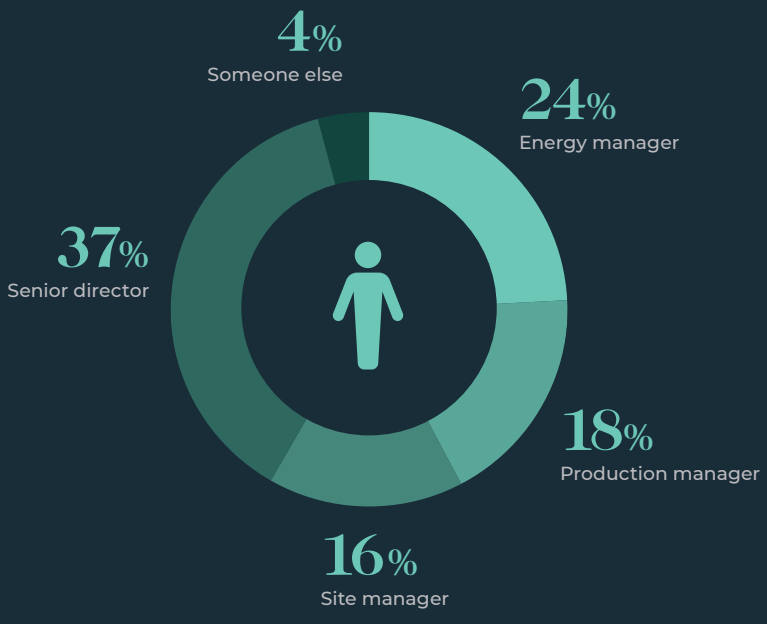
Sectors

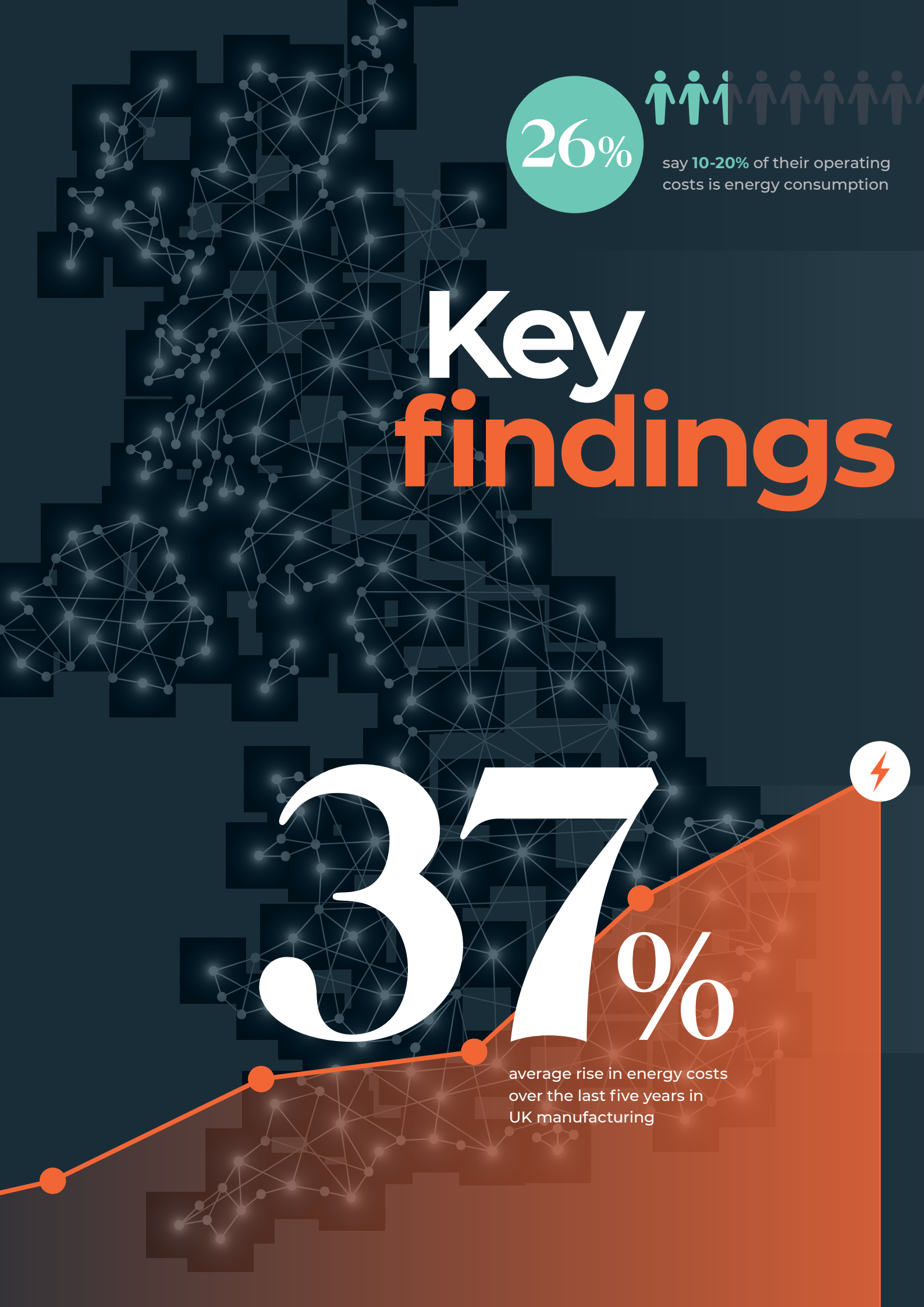
A broad range of industry sectors were identified for the research, providing an understanding of how decentralised energy is viewed across UK industry.



Job roles

A total of 201 people were interviewed across a number of different job roles.




26%
say 10-20% of their operating costs is energy consumption
Key findings
37%
average rise in energy costs over the last five years in UK manufacturing

49% of respondents identified high cost as the main barrier to a decentralised energy solution

55% say energy prices are impacting competitiveness

31% cite lack of finance availability to purchase as an incentive towards long term hire

36% stated that changing technology is a significant barrier to investment

49% identified lower energy costs as the key driver behind a decentralised energy decision

82% of respondents stated **power continuity** being a major or significant concern to their business

30% identified security of supply as the key driver

68% say concerns over production are the main barrier to implementing a demand side response solution

38% of respondents have had an investment for new equipment to reduce energy consumption turned down in the last five years due to capex restrictions

51% of respondents required a payback of three years or less for a capital expenditure, yet **10-15** years is a typical payback for purchased solutions like CHP

Foreword

The UK is operating in a highly competitive world, one in which the cost of energy can have an enormous impact on our ability to take on and win against our global competitors.

And yet, attempts to reduce energy consumption all-too-often run into the familiar road blocks. The UK's ageing and inefficient asset base is one barrier, but so are capex constraints and the perceived technical obstacles of implementing many of the potential solutions.

The truth of the matter is, the low-hanging fruit of energy efficiency measures, such as LED lighting, have largely been picked.

New opportunities, such as demand side response (DSR), gas and renewable generation offer a tantalising glimpse of a decentralised energy future in which companies generate their own energy, and sell their surplus back to the grid.

But the fact is, the route forward is now more complex. Many energy users are finding themselves at a point where crucial decisions must be made, but are caught between the desire to move forward — in turn reducing costs and their impact on the environment — whilst, all the time, grappling with the twin technical and financial issues that any solution must solve.

In short, for a variety of reasons, there is an understandable reluctance to make the not insignificant jump to a decentralised solution. The real challenge is obtaining the right long-term solution while meeting business short-term needs.

The aim of this report is to begin the process of stripping away the blockages and barriers, identifying solutions, short and long-term, including potential bridging-gap solutions, which can encourage UK industry to think laterally to ultimately improve energy security and aid competitiveness.

Thank you for reading.

Chris Rason
Managing Director Northern Europe
Aggreko UK

Section 1: Decision-making, consumption and security

Who is making energy decisions?

Whilst there are often multiple energy stakeholders in an organisation, there is usually only a limited number of decision-makers.

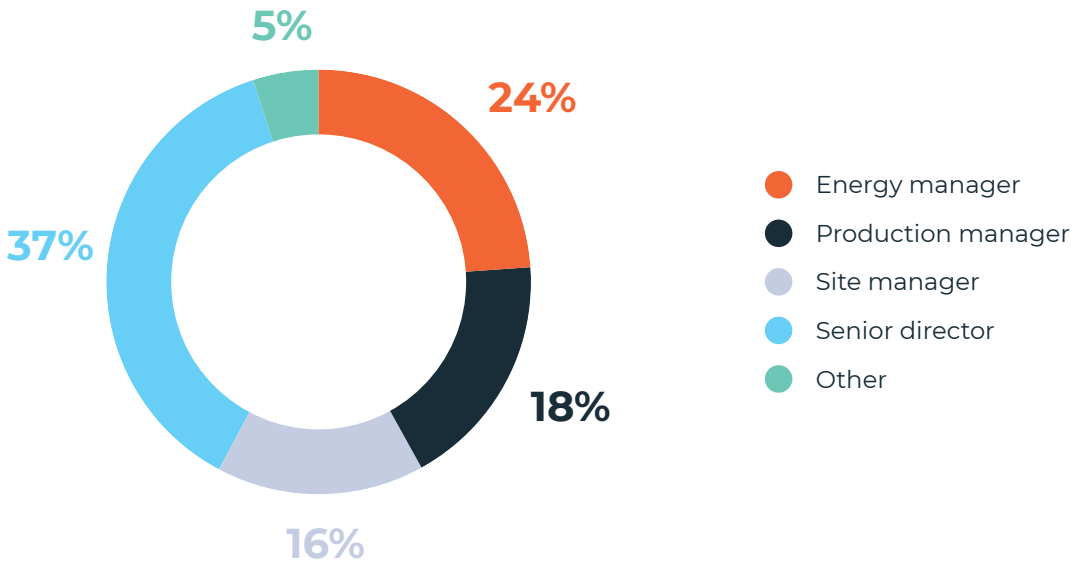
We first wanted to determine who, in their organisation, has responsibility for energy procurement and, crucially, responsibility for ensuring that a business has access to energy in all contingencies.

The responses demonstrate that energy decision-making within UK industry remains highly fragmented. Whilst 24 per cent of respondents placed energy decision-making with their in-house energy manager, 76 per cent leave energy decision-making in the hands of other job roles with potentially no specific technical energy knowledge. In fact, 37 per cent of respondents declared that energy was the responsibility of a senior director, with 18 per cent answering that decisions fell to the production manager and 16 per cent the site manager.

If a lack of technical energy knowledge is recognised by decision-makers in industry, where are they turning for advice on their energy consumption?

Our research demonstrates that, all-too-often, the only source of advice is their regular utility provider, with half of all respondents (50 per cent) declaring that their energy provider is who they turn to. Interestingly, only a third of respondents (36 per cent) answered that they use an external energy consultant for impartial advice.

Who is responsible for energy decision-making?



Reliability and security

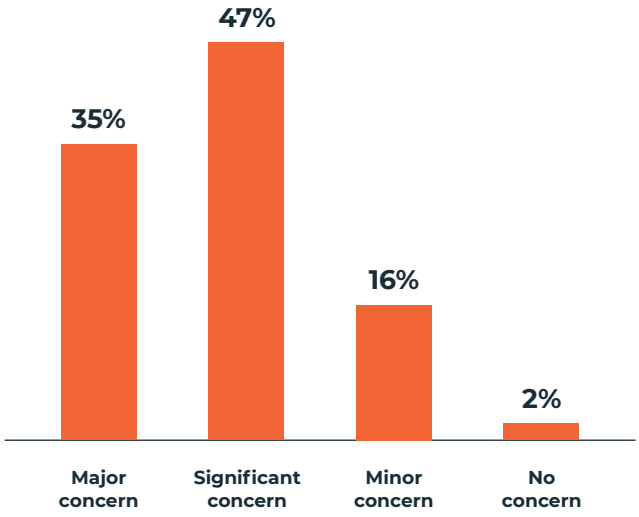
Energy security

Anecdotally, we have found that the issue of energy security is just as important as price when it comes to energy decision-making. However, we wanted to put some hard numbers on what we are finding in the marketplace.

Specifically, with energy sources diversifying over recent years due to older power stations closing and North Sea gas reserves reducing, organisations need to ensure they are able to receive a reliable and secure supply of power to remain competitive.

We asked our panel to specify their level of concern and found that 82 per cent of respondents categorised security as either a major concern or a significant concern for their organisations. Only 18 per cent said energy security was just a minor concern or of no concern at all.

How concerned are you about energy security?



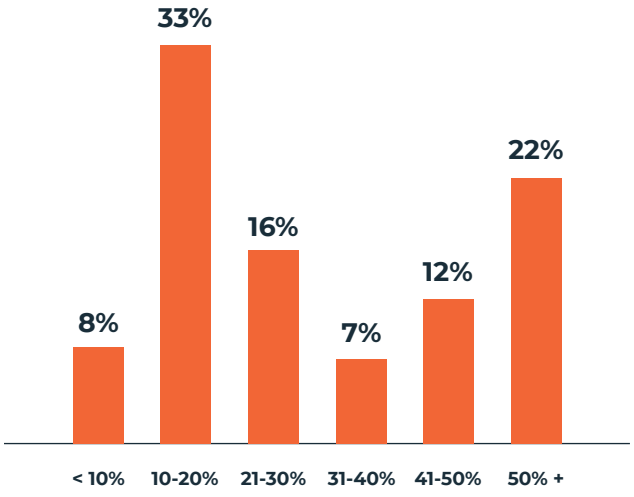
Energy use

We often talk about the three Cs of electricity, namely cost, consumption and competitiveness.

With our panel, we first addressed the issue of cost, by asking them to estimate how much their annual electricity bills had increased over the last five years.

The answers demonstrate that UK industry has been impacted by significant increases to electricity costs, with more than a quarter of all respondents declaring an increase of between 10-20 per cent. Only eight per cent of those surveyed said their bills had increased by less than 10 per cent.

Increase in electricity bills over the last five years



We asked our UK industry panel whether electricity prices were impacting their own industry's competitiveness. More than half of all respondents (56%) replied that prices were impacting competitiveness.

On average, respondents working in the manufacturing sector have seen their energy bills rise by 37 per cent in the past five years. 90 per cent of those surveyed working in manufacturing anticipate further price rises and more than half (53%) say increases are impacting their competitiveness.

Attitudes to reducing energy consumption

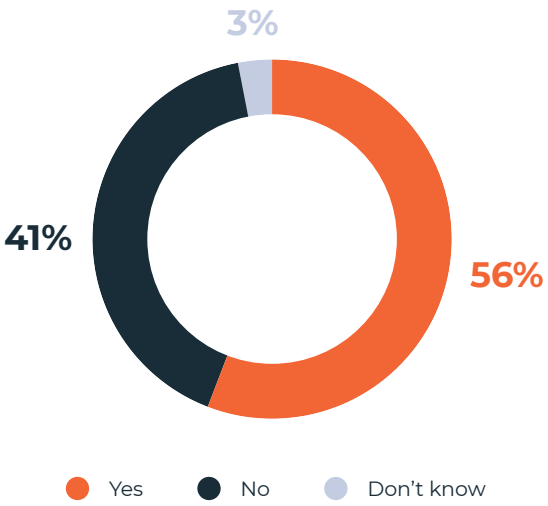
The answer, therefore, would appear to lie in organisations taking control of their own energy needs, both by reducing consumption and also utilising alternative energy solutions, such as decentralised energy.

We asked our panel how they would categorise their company's approach to reducing electricity consumption and their exposure to further price increases. Worryingly, despite increases in electricity bills, the impact on operating costs and competitiveness, 52 per cent of respondents still declared that reducing energy consumption was only a medium priority.

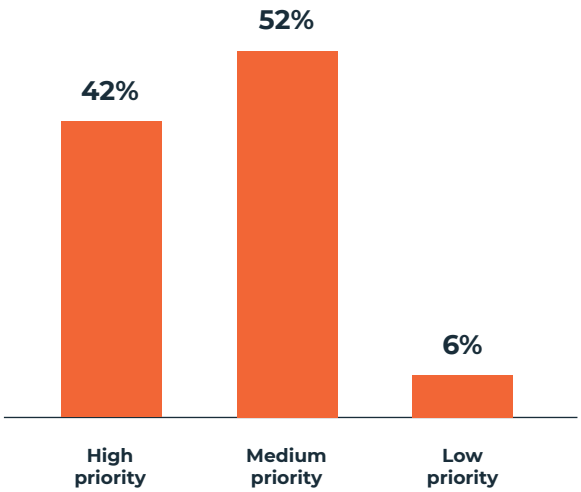
Finally, we asked what steps our respondents from the UK have taken to reduce energy consumption. We offered a range of options, from lighting through to renewables. As we expected, our panel confirmed that technology such as LED (72%) and high efficiency boilers (59%) were the most popular, but that more technologically advanced or complex solutions, such as combined heat and power (CHP) (44%) or lower tariffs in return for a short-term lowering of demand (42%) were less popular.

The suspicion remains that UK industry has picked the 'low hanging fruit' to reduce their energy consumption, but that significant psychological, cultural or technological barriers remain in the way of other solutions. We will examine this further in the next section.

Are electricity prices impacting competitiveness?



Attitudes to reducing electricity consumption



Section 2: DSR and decentralised energy

Demand side response

The short-term lowering of electricity demand in return for lower tariffs, or demand side response (DSR), is an increasingly popular solution for industry to lower its electricity costs.

We wanted to understand the extent of the uptake of DSR and also identify the potential barriers to further participation.

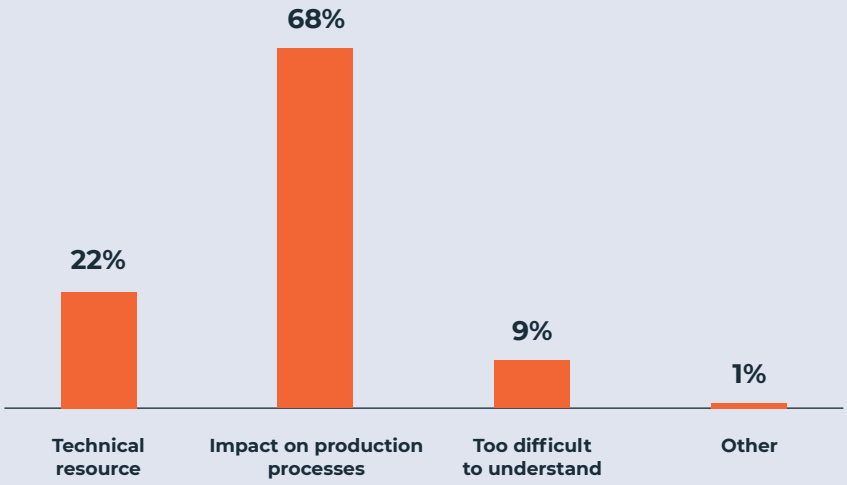
The good news is that 57 per cent of respondents confirmed that they are accessing lower electricity tariffs in return for a short-term lowering of demand. However, this still leaves 40 per cent who have no such system in place.

The key question is, why not? Certainly, DSR requires a shift in mindset away from electricity on demand, and towards a more flexible response. But we have also encountered technical concerns and scepticism about the potential costs and benefits.

We asked our panel what their main concerns were in regard to implementing a DSR solution. Crucially, more than two-thirds responded that their main concerns related to the impact that DSR would have on their production processes. This concern is particularly acute in the manufacturing sector, with over two-thirds (68%), citing production concerns as a key barrier.

A further 22 per cent said they lacked the technical resources to implement a DSR solution, with only nine per cent highlighting that they found it too difficult to understand the potential costs and benefits.

Barriers to implementing a DSR solution



Decentralised energy

There are many advantages for UK industry in implementing a decentralised energy solution, but how many organisations have actively considered generating their own energy?

We asked our panel, and their responses suggest that many remain reluctant to actively consider alternative methods of generating electricity. In fact, 43 per cent of respondents declared that they have not considered their own electricity generation.

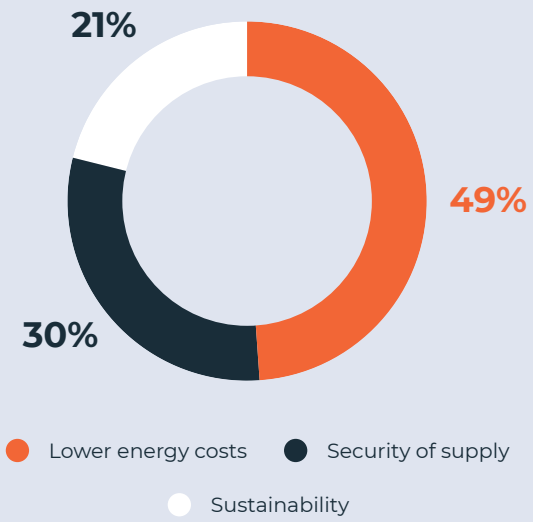
Similarly, whilst 48 per cent of respondents declared that their companies had undertaken a decentralised energy feasibility study, 48 per cent had not. The cultural and perhaps mental barriers towards decentralised energy remain considerable.

We asked our panel to identify the main driver behind a decision to implementing a decentralised energy solution, and found that nearly half of respondents (49%) answered lower energy costs. However, it is interesting to note that a significant number (30%) identified security of supply as a major concern, more than sustainability with 21 per cent.

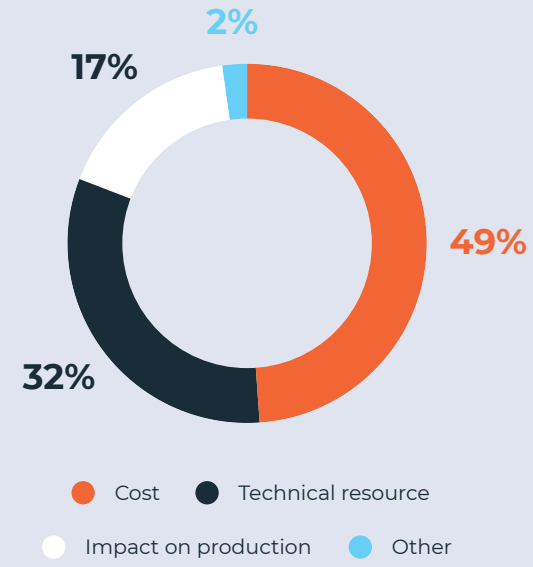
Whilst the main drivers are clear, the barriers are equally as easy to identify. As we expected, the main barrier to implementation is cost with 49 per cent of respondents identifying this as the main reason. Nevertheless, this is far from the only reason identified, with the lack of technical resource, highlighted by 32 per cent of our panel, also a key reason.

Interestingly, the potential impact on production processes is much less of a barrier than the DSR solution. Only 17 per cent of respondents identified concerns over electricity supply from a decentralised solution as the main barrier to implementation.

Reasons for implementing a decentralised energy solution



Barriers to implementing a decentralised energy solution



Potential decentralised energy solutions

While significant barriers remain in place, which solutions offer the most potential for UK industry?

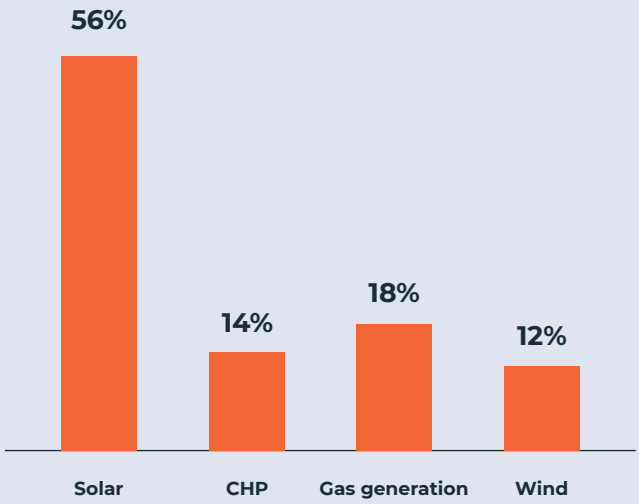
Our panel of industry leaders overwhelmingly identify solar (56%) as the technology which they believe has the greatest potential, with gas generation (18%) trailing behind along with CHP (14%). Of course, solar is the most mature renewable technology and has therefore had longer to prove its worth in the market. Its adoption has been supported by falling technology prices and government support over the years.

Our reading of this result is that the benefits of gas generation of electricity, in combination with a battery storage solution, in order to take advantage of the price differential between electricity and gas, is not sufficiently understood by industry.

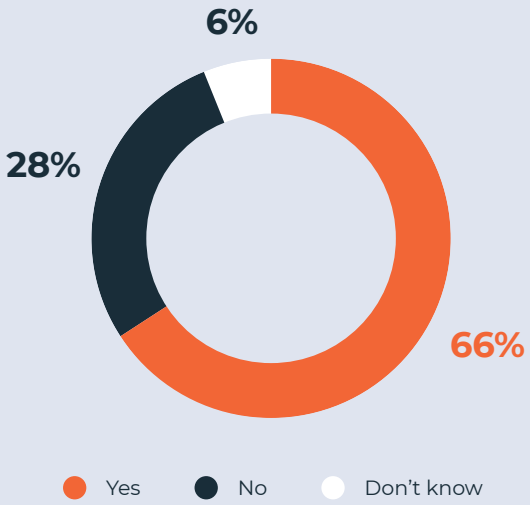
Our suspicion is that those companies with a dedicated energy resource in-house or with access to an external energy consultant are fully up-to-speed with the potential of gas generation. However, the lack of expertise across much of UK industry, the wide spectrum of energy stakeholders and decision-making all-too-often lying with those for whom energy is a non-core activity, has left many in industry blind to its potential.

We also asked our respondents whether they or their organisations would consider alternative fuels such as hydro-treated vegetable oil, or HVO. Two-thirds of our respondents answered positively, which suggests that minds are open to alternatives, as long as technological, production and supply concerns can be addressed.

Decentralised energy solutions with most potential for UK industry



Would you consider alternative fuels such as HVO?



Section 3: Financing energy efficiency

Finance and payback

Cost has already been identified as a key barrier to the implementation of new energy efficient technology and decentralised energy solutions.

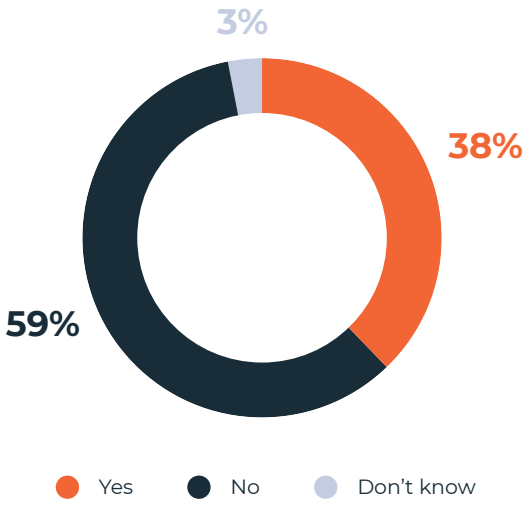
However, we were interested to find out how many of our panel had actually had a request for investment turned down due to capex restrictions. The responses demonstrate that while the purse strings may be loosening, with 59 per cent replying in the negative, 38 per cent have had requests turned down.

Very often, the reason for this negative response is payback periods. We therefore asked our panel about the length of payback required by their organisations to get energy investments signed off.

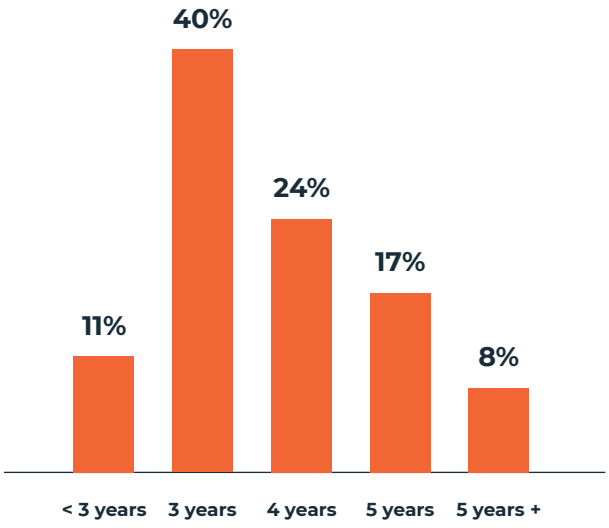
The results clearly demonstrate that UK industry remains hamstrung by a three-year investment cycle with long payback periods. In fact, only 11 per cent of respondents identified a payback period of less than three years, with 40 per cent admitting to three years and 24 per cent four years.

The potential for a bridging-gap solution, which offers access to new technology without capex investment, is clear.

Have you had an investment request for energy efficient equipment turned down?



Payback periods for investment in new energy efficient equipment



The technology challenge

Traditionally hire has been viewed as a short-term option and we wanted to find out if there was any change in that position. We asked our panel if their organisations viewed hire as a short or long-term option.

As we suspected, 68 per cent of industry will only consider hire to overcome short-term requirements, rather than undertaking a long-term hire in place of purchase (32%).

Hiring equipment is also a method of avoiding capex restrictions, in turn enabling access to new technologies.

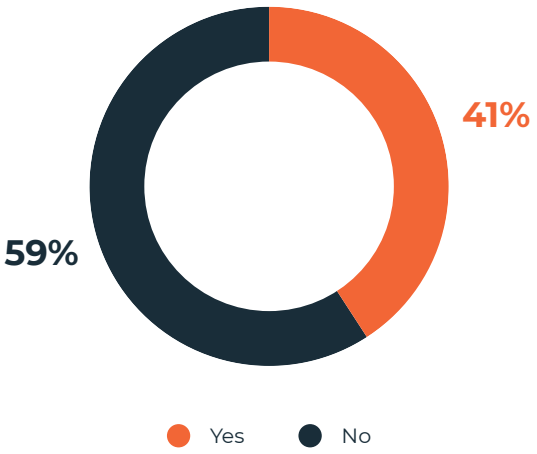
However, UK industry has traditionally remained reluctant to embrace the potential for hire, particularly over the long term.

We asked our respondents whether their organisations ever use hire to avoid capex restrictions and were encouraged by the fact that 41 per cent answered positively. However, that figure does mean that the majority, 59 per cent, still remain reluctant to take the off-balance sheet option.

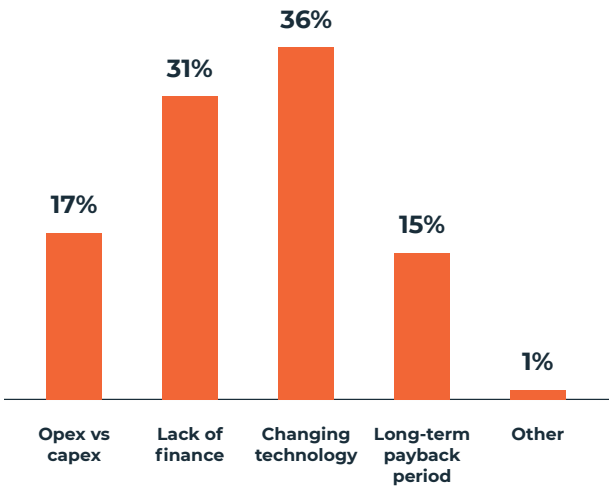
We then asked our panel to identify the single biggest reason why they would consider long-term hire rather than outright purchase.

Whilst the opex versus capex argument was strong (17%) along with a potential lack of finance (31%), it was interesting to note that hire, as a way of accessing new technology as a bridging-gap solution, was cited by 36 per cent of respondents.

Do you ever hire to avoid capex restrictions?



Incentives for long-term hire



Conclusions

The results from this research paint a picture of many industrial energy users caught in an energy trap, between wanting to become more secure and the constraints placed upon them, in terms of both capex and potential payback periods.

The feeling is that large parts of industry are simply shrugging their shoulders and saying, “there’s nothing we can do”. Too many know that the internal funding battles to upgrade equipment or move towards a decentralised energy solution, will potentially be too long and too hard.

What is surprising is that more are not using long-term hire as a bridging-gap solution, enabling them to access new technology, lower costs and greater energy security, without having to make a significant capital outlay.

This problem is almost certainly cultural. British industry, not unlike our homeowners, prefers capital counted on the balance sheet rather than equipment on the profit and loss.

However, there are chinks of light. If 68 per cent of survey respondents say that concerns over production continuity are the main barrier to implementing a demand side response solution, then the message must be that decentralised energy generation, possibly using gas or combined heat and power to take advantage of the differential between electricity and gas prices, is a potential answer that could offer savings immediately.

Similarly, changing technology is cited as a key reason why long-term hire would be considered. This comes as no surprise as the R&D required for new technologies and the consequently high price point makes them reliant on being supported by government mechanisms.

The challenge that awaits UK industry is to turn interest and concern into action. It will require a change in mindset to embrace new ways of generating electricity, new methods of paying for access to technology and new methods of working.

The technologies and the opportunities exist for those who want to find solutions and benefit from the savings and security immediately, but with low exposure to risk.

The question is, why wait?

Expert view

The Association for Decentralised Energy

This report provides an extremely useful overview of the barriers to deployment of decentralised solutions for industrial energy users. Decentralised energy solutions, such as those provided by Aggreko, enable more flexible demand and reduce energy consumption, allowing industrial and business users to participate more fully in the UK energy system; users can increase their competitiveness, reinforce their security of supply and help towards meeting their sustainability and low carbon targets.

More can be achieved if government simplifies policy and regulation, enabling users to compete effectively and recover the true value provided to the energy system. At the same time, industry needs to have access to a resource of technical energy knowledge and overcome the cost constraints involved in investing in high capex assets with long payback periods. As shown by Aggreko's report, for some businesses, taking assets on long-term hire offers a solution, giving them access to necessary technologies without encountering capex barriers, and still remaining eligible for incentives that arise from, for example, being classed as Good Quality CHP under CHPQA.

More and more businesses are discovering the revenue potential of engaging in decentralised energy and it is encouraging to see Aggreko's findings that almost 60 per cent are now enjoying lower electricity tariffs for their flexibility. This demonstrates that many industrial processes can engage in demand side response without production being affected. For businesses whose production model does not allow this flexibility, however, decentralised solutions can offer an alternative approach, while still helping to reduce energy consumption and allow access to potentially lucrative markets.

The next few years hold exciting opportunities for industrial users. Power markets are opening up with flexible generation and demand side response, offering the opportunity for industry to earn significant revenues in new markets – including reformed balancing services, the Balancing Mechanism and the new pan-EU platform called Project TERRE.

We need to continue this progress and put industrial, commercial and domestic users at the heart of the energy system. The Aggreko report is therefore extremely timely as the UK energy system moves forward.

Caroline Bragg
Senior Policy Manager
The Association of Decentralised Energy (ADE)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www.aggreko.com/energygap