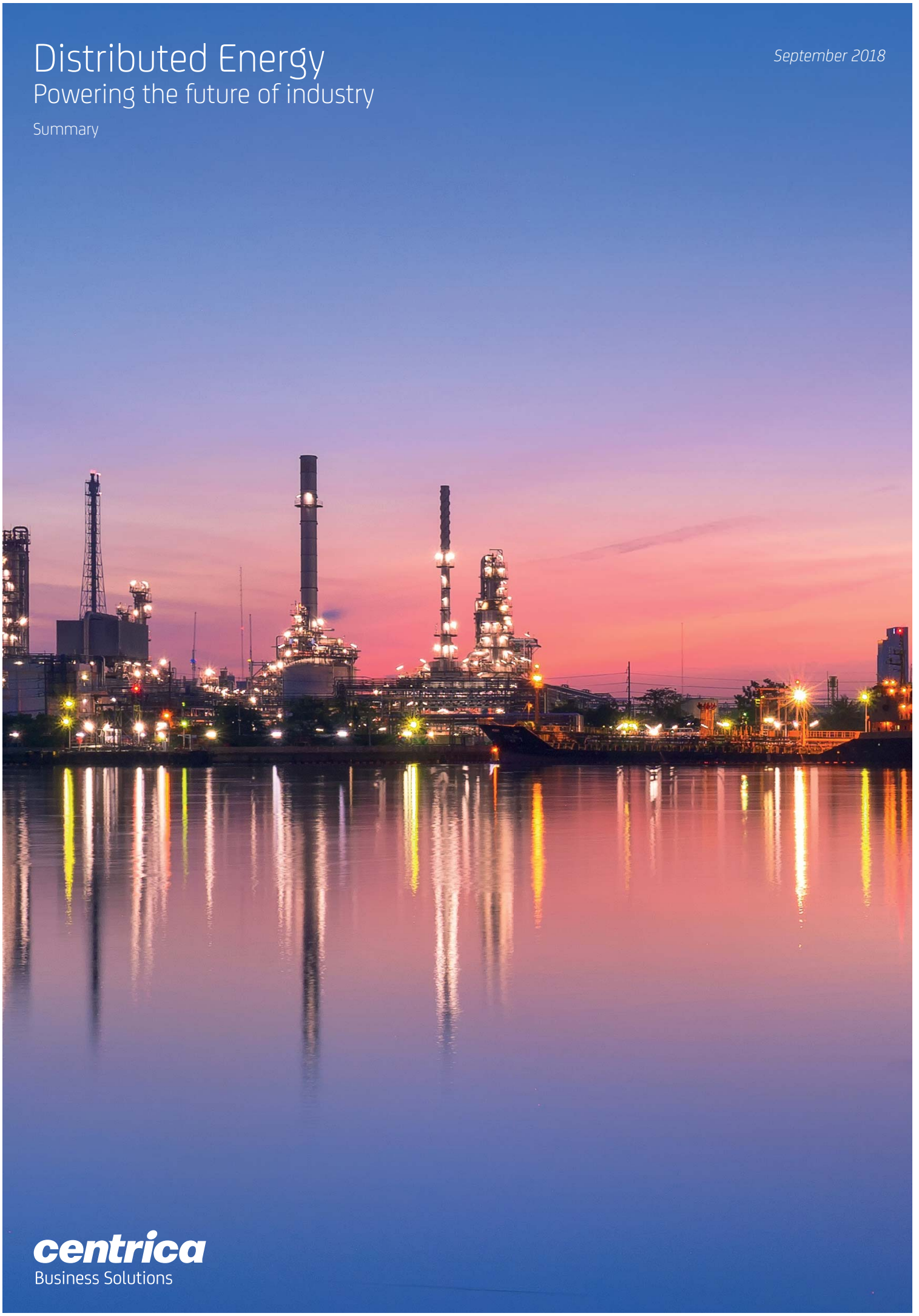
Distributed Energy

Powering the future of industry

Summary

September 2018



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Contents

Foreword

“By exploiting the energy technology of the 21st Century, I believe UK industry can inspire a new revolution which will boost economic growth and create jobs.”

The industrial sector uses one quarter of the UK’s entire electricity supply. As well as being a staggering statistic, I believe this is also a clear signal of the opportunity for industrial organisations to play their part in the changing energy landscape, while also unlocking the potential of energy to ensure our position in the global marketplace.

We should take our inspiration from the Industrial Revolution which began in the UK over 200 years ago. At the heart of that seismic change was new technology which created the ability to harness energy on a large scale for the first time.

Today, by exploiting the energy technology of the 21st Century, UK industry can inspire a new revolution which will boost economic growth and create jobs. It could also give the UK a critical competitive advantage as we adapt to life outside the European Union.

In this report, we show how UK industry could save £540 million a year by adopting the full range of distributed energy solutions. But more significantly, we also show how this could help to create hundreds of thousands of new jobs, boost overall economic growth and even help to tackle that age-old UK affliction – our low productivity.

At Centrica, we believe that the energy system of the future will look fundamentally different to how it does today; and we are committing hundreds of millions of pounds in new investment over the next few years to make that future a reality.

Our approach is not just about more efficient ways of saving energy; it is also about producing more electricity closer to the point of use through technologies such as solar, Combined Heat and Power and battery storage; and it is about harnessing the full power of data and the digital world to give industry real control of its energy use.

Adopting new energy technology will ultimately help our industrial sector to grow, become more productive and create jobs.

I hope this report inspires you to make this vision a reality.

Jorge Pikunic, Managing Director,
Centrica Business Solutions

September 2018

Executive summary

Energy is one of the largest operational costs borne by UK industrial businesses. Using energy more effectively will not only improve the bottom line, but also boost productivity, resilience and competitiveness.

Context

Although the UK economy continues to grow, the underlying rate is modest by historical standards, and manufacturing output has fallen back from the high point which it reached at the end of 2017. The UK's trade deficit has noticeably worsened, as exports of goods such as cars and planes have declined sharply while imports have risen. The total UK trade deficit widened by £4.7 billion to £8.6 billion in the three months to June 2018[1].

This adds up to a challenging outlook for the UK industrial sector, as the export dividend from a weaker pound diminishes and the higher price of imported goods begins to have an impact on input costs. Brexit has created uncertainty not just about demand for UK manufactured goods once we leave the EU but also about the impact on cross-border movement of goods and the resilience of supply chains.

UK industry also continues to suffer from relatively low productivity, lagging behind most of our peers in the G7 group of leading industrialised nations. GDP output per hour worked is more than 20 per cent higher in the US, compared to the UK, and in Germany it's nearly 30 per cent higher[2].

£12bn

Industrial sector spend on energy per year

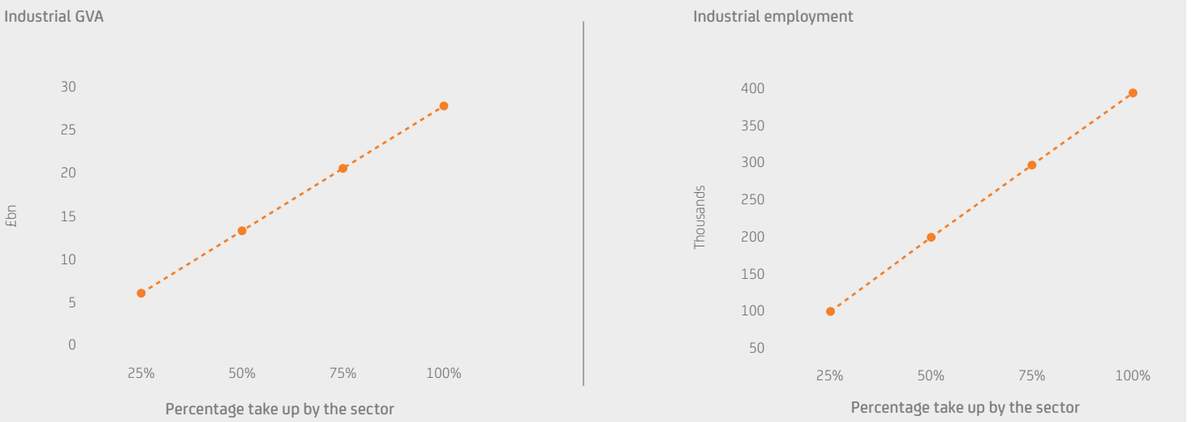
Energy costs on average account for three per cent of UK business expenditure. But there are 16 sectors in the economy – nine of which are energy intensive industries such as the iron and steel sector – where energy costs represent more than 10 per cent of total business expenditure[3].

£540m

Potential reduction in annual energy costs

These are sectors where the UK is fighting to compete in a global marketplace. With our industrial sector using 92 million megawatt hours of energy in 2017, small changes in energy costs can have a big impact[4].

The UK currently has the second highest industrial electricity prices among the G7 countries[5]. Helping businesses to use energy more effectively will be critical in ensuring that the UK can improve its productivity, boost competitiveness and seize new post-Brexit trade opportunities.



> "Helping businesses to use energy more effectively will be critical in ensuring that the UK can improve its productivity, boost competitiveness and seize new post-Brexit trade opportunities."

Industry economic benefits

Our report reviews the economic impact if just 50 per cent of businesses in the industrial sector adopted distributed energy solutions.

Our findings suggest that businesses could reduce energy costs by £540 million a year, enough to fund the average UK salaries of more than 11,000 professional engineers[6], or save five per cent of the sector's total annual energy spend[7].

The 50 per cent scenario could also create £13.9 billion for UK GVA (Gross Value Added) and support around 195,000 jobs that would be needed to help deliver distributed energy technology for the sector.

£13.9bn

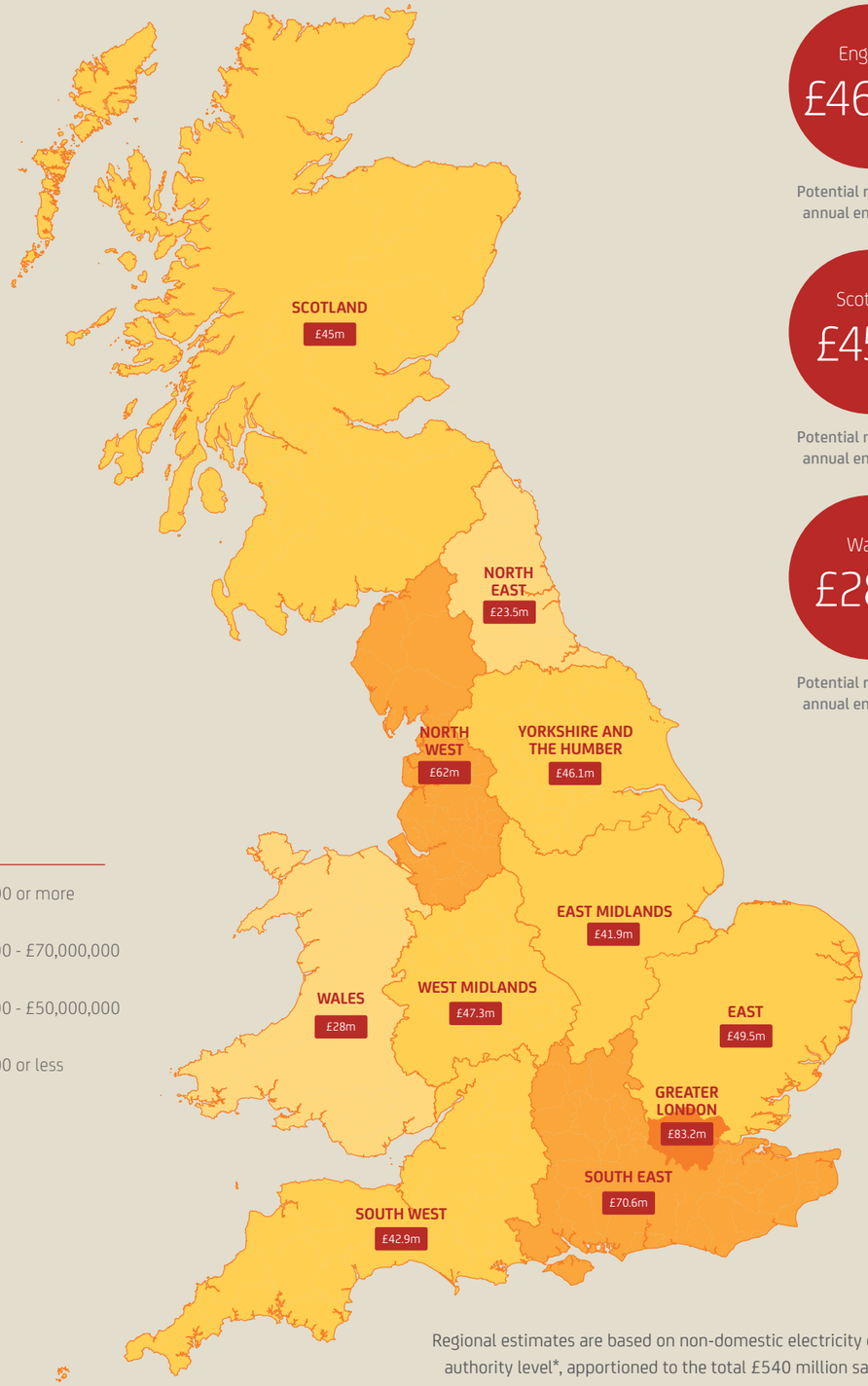
GVA to UK

195,000

Jobs supported

1 ONS, statistical bulletin: UK Trade, June 2018
2 ONS, international comparisons of UK productivity (ICP), final estimates: 2016
3 Department for Business, Energy and Industrial Strategy (BEIS), Business energy statistical summary July 2018
4 BEIS, DUKES June 2018
5 BEIS, industrial electricity price in the IEA, June 2018
6 https://www.theengineer.co.uk/engineer-salary-uk-2018/
7 BEIS, DUKES July 2018

Breakdown of projected savings by region



England
£467m
Potential reduction in annual energy costs

Scotland
£45m
Potential reduction in annual energy costs

Wales
£28m
Potential reduction in annual energy costs

Key

- £71,000,000 or more
- £51,000,000 - £70,000,000
- £31,000,000 - £50,000,000
- £30,000,000 or less

Regional estimates are based on non-domestic electricity demand at a local authority level*, apportioned to the total £540 million savings opportunity

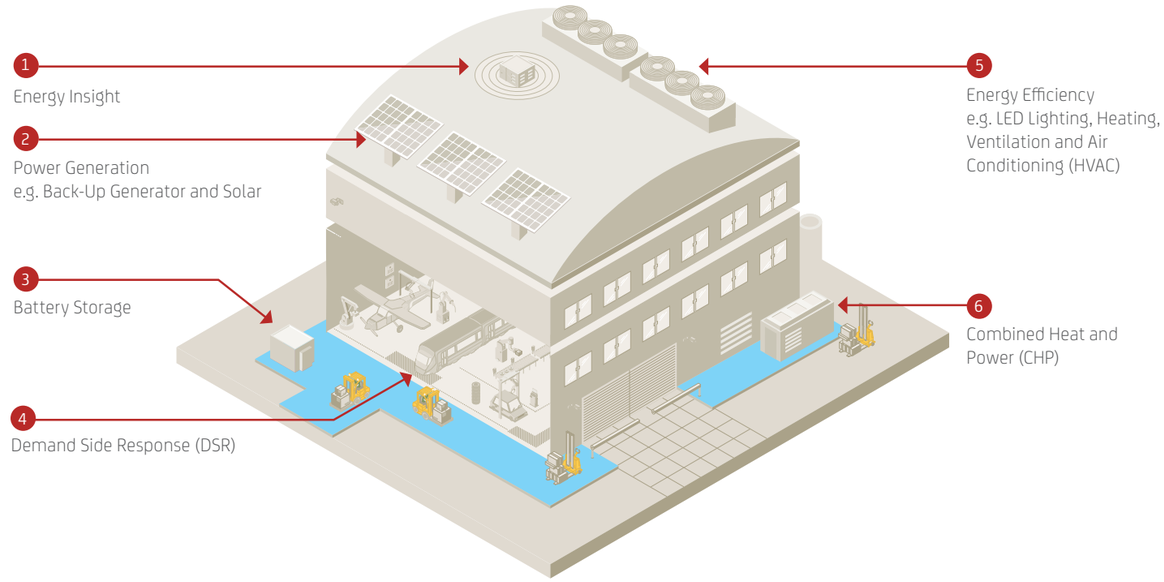
*Source: BEIS national electricity consumption statistics (2016)

Background: What is distributed energy?

The first step in understanding the potential of distributed energy solutions is understanding what the term means.

The World Alliance for Decentralised Energy defines this as "electricity production at or near the point of use, irrespective of size, technology or fuel used – both off-grid and on-grid." We believe that this is a good start, but is too narrowly defined.

Distributed energy should also cover a much broader range of solutions, including energy efficiency, monitoring and on-site generation, that can help industrial businesses to take control of their energy and turn it into an opportunity.



1. Energy Insight

New technology is available that allows larger energy users to accurately monitor their energy use across all equipment and devices. For example, Centrica Business Solutions' own Panoramic Power technology.

2. Power Generation

A range of small-scale power generating technologies can provide on-site generation; delivering back-up power and the ability to sell excess energy back to the grid.

3. Battery Storage

Lithium-ion battery storage systems can be charged at cheaper times and then used when prices increase to better manage energy costs. They can also work alongside renewable technologies, which on their own are intermittent, and can be used to support the grid, which will create new revenue.

4. Demand Side Response (DSR)

Revenue streams are available for energy users if they are able to reduce, or even increase, their energy consumption at times when the grid demands it. New technology allows energy users to respond to these changes in demand quickly and easily, without putting security of supply at risk.

5. Energy Efficiency

Reducing costs by upgrading or improving a range of energy-consuming processes.

6. Combined Heat and Power (CHP)

CHP plants work by converting gas into both electricity and heat in a single process. It's one of the most efficient sources of energy and allows significant amounts of energy to be produced on-site, improving the resilience of supply, reducing costs and helping to reduce carbon emissions.

The national picture

The information in this report is taken from 'Distributed Energy: Powering Britain's Economic Future', published by Centrica Business Solutions in November 2017.

This research provides a picture of the scale of the potential economic benefit for the UK economy if the opportunities from distributed energy solutions are taken up in the healthcare, industry, and hospitality & leisure sectors.

Our analysis shows that if just 50 per cent of the three sectors utilised these solutions it could deliver:

£980m

Potential reduction in annual energy costs

£18.5bn

Economic boost to UK GVA

260,000

New jobs

1.5%

Boost to UK economic output

Centrica commissioned FTI Consulting to help develop the quantitative analysis for this report.

FTI Consulting is an independent global business advisory firm, with deep expertise and significant experience in energy markets, and in performing economic analysis across a range of sectors.

To read the report in full and view our methodology, visit **centrica.com/economicfuture**

About Centrica

The world of energy is changing and, with our chosen businesses, distinctive positions and current capabilities, Centrica is well placed to deliver for its customers and for society.

We will satisfy our customers, deliver cash flow growth and returns for our shareholders and be efficient and excellent in our operations.

We are shifting investment towards our customer-facing businesses – organised around two global customer facing divisions: Centrica Consumer and Centrica Business focused on the residential consumer and the business customer respectively.

Our areas of focus are Energy Supply & Services, Connected Home, Distributed Energy & Power, Energy Marketing & Trading.

We supply energy and services to over 27 million customer accounts mainly in the UK, Ireland and North America through strong brands such as British Gas, Direct Energy and Bord Gáis supported by around 12,000 engineers and technicians.

We are focused on delivering high levels of customer service, improving customer engagement and loyalty. We aim to be a good corporate citizen, employer of choice and to provide leadership in a dynamic and changing world.

We are developing innovative products, offers and solutions, underpinned by investment in technology. In February 2017 we announced the creation of a new venture 'Centrica Innovations' that will identify, incubate and accelerate new technologies and innovations. We will look to invest up to £100 million over the next five years in start-ups, giving us access to technology and entrepreneurial capability and resources.

For more information: **centrica.com**

About Centrica Business Solutions

Centrica Business Solutions has been established to develop new thinking, new technologies and new ways of working to help our customers take control of their energy and improve their performance, resilience and growth.

Our energy intelligence, products and solutions are already powering the ambitions of more than 4,500 customer sites around the world. From retail and manufacturing to health and education, we help our customers improve their operational efficiency, increase their resilience, and unlock new sources of value and revenue. Centrica will be investing over £700 million in this area by 2020.

For more information: **centricabusinesssolutions.com**

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