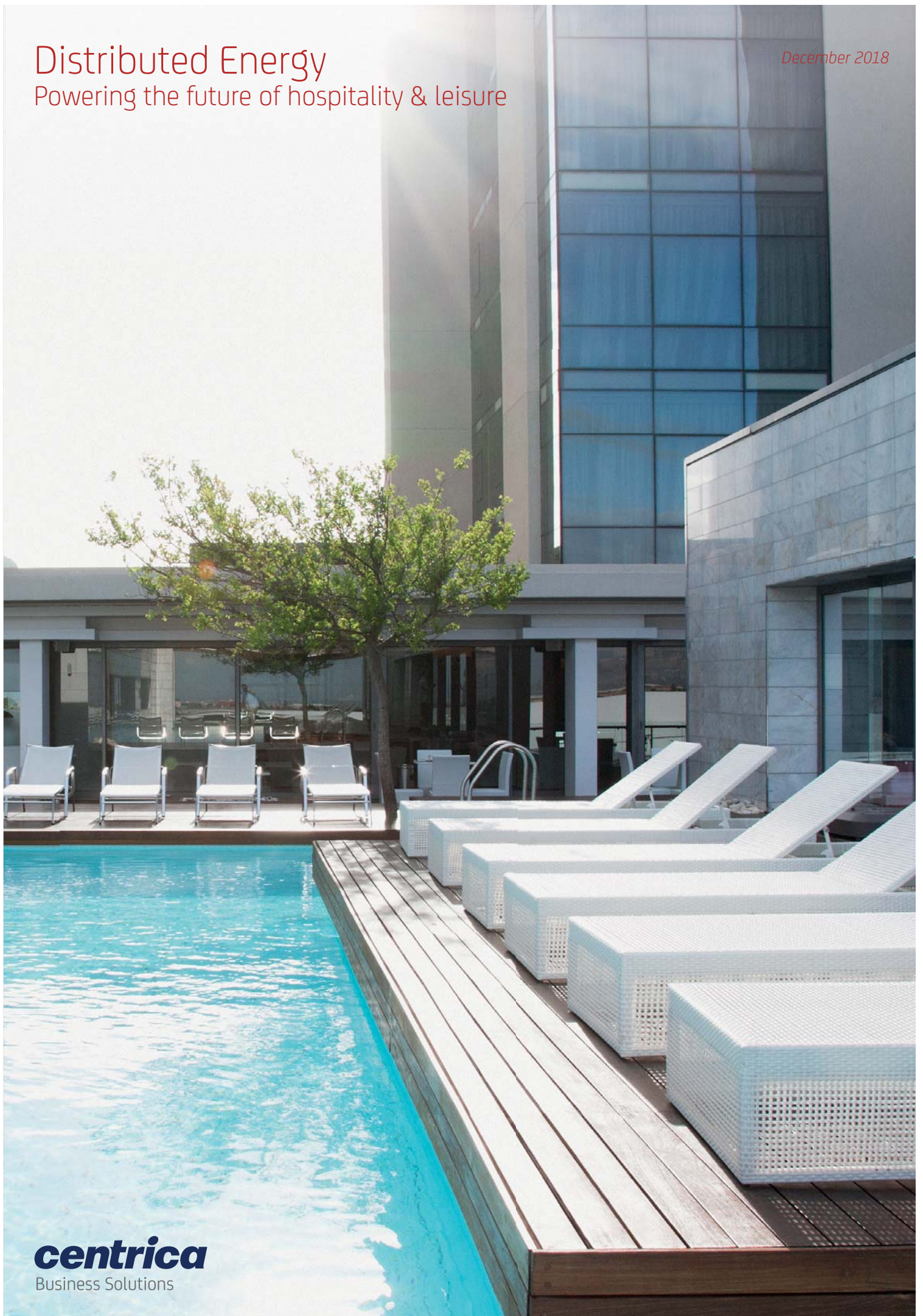


Distributed Energy

Powering the future of hospitality & leisure

December 2018



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Foreword

“

I believe that energy can be used by the UK hospitality and leisure industry as a powerful tool to unlock cost savings, new revenue streams and drive growth.”

The hospitality and leisure industry is a great British success story. In recent years we have seen the exponential growth of budget hotel chains, gastro pubs and any number of other leisure outlets and experiences. The sector has created 300,000 new jobs in the past five years alone and is now the UK's third largest employer.

But, for businesses that traditionally work on very thin margins, costs are a constant worry. And Brexit presents a twin challenge. Imported items such as food and alcohol could become a lot more expensive; and wage costs could be particularly impacted by changes to the way businesses are resourced.

Consumers are shifting their habits too. Sustainability and the fight against climate change are becoming increasingly important concerns, and the public is looking to companies to act more sustainably and reduce their impact on our planet.

Faced with these pressures, I believe that the UK hospitality and leisure industry can use energy as a powerful tool. Specifically, there is a range of distributed energy solutions which can give the sector a competitive advantage and allow it to unlock energy cost savings, new revenue streams and drive growth.

Forward-thinking hotel chains, restaurants, football stadiums and many others are adopting new energy technologies and harnessing the power of data analytics and the digital world to turn their energy consumption and energy resilience into a business opportunity.

In this report, we identify that by adopting technologies such as solar, Combined Heat and Power (CHP) and battery storage, the UK hospitality and leisure sector could save at least £310 million a year on its energy bill. It could also boost the UK economy by £3.7 billion Gross Value Added (GVA) and support 50,000 jobs on top of the millions it supports today.

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

Adopting new energy technology will allow our hospitality and leisure sector to compete on the world stage, attract, retain and inspire customers, and drive economic prosperity.

I hope this report encourages the sector to take up this exciting opportunity.

Alan Barlow, UK & Ireland Director,
Centrica Business Solutions

December 2018

Executive summary

Hospitality and leisure firms are operating in an increasingly competitive market, meaning a focus on reducing operating costs will be essential to ensuring profitability. Distributed energy technology offers the opportunity to reduce costs, create new revenue streams, and enhance sustainability credentials.

Context

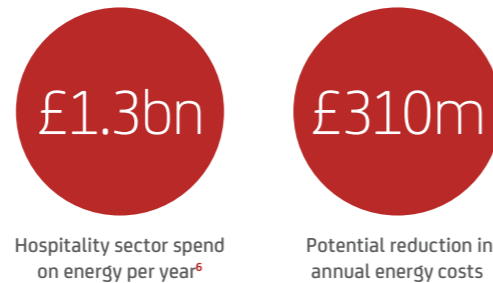
The UK hospitality sector is the third largest employer in the UK, with 3.2 million people working directly in the sector and another 2.8 million working indirectly in 2017¹.

In recent years the sector has flourished, driven by growing demand for leisure and business travel. Leisure travel has been supported by the weaker pound, but slowing economic growth and spiralling numbers of new rooms have led analysts to predict a dampening of performance in the UK².

The weaker pound has also had a negative impact on some businesses as it pushes up the cost of imported goods. Hikes in business rates and lower than inflation revenue growth have also taken effect on businesses.

Rising recruitment and wage costs and the impact of Brexit on the flow of European migrants is taking its toll on the sector too, with 90,000 staff vacancies recorded in the quarter to June 2018³.

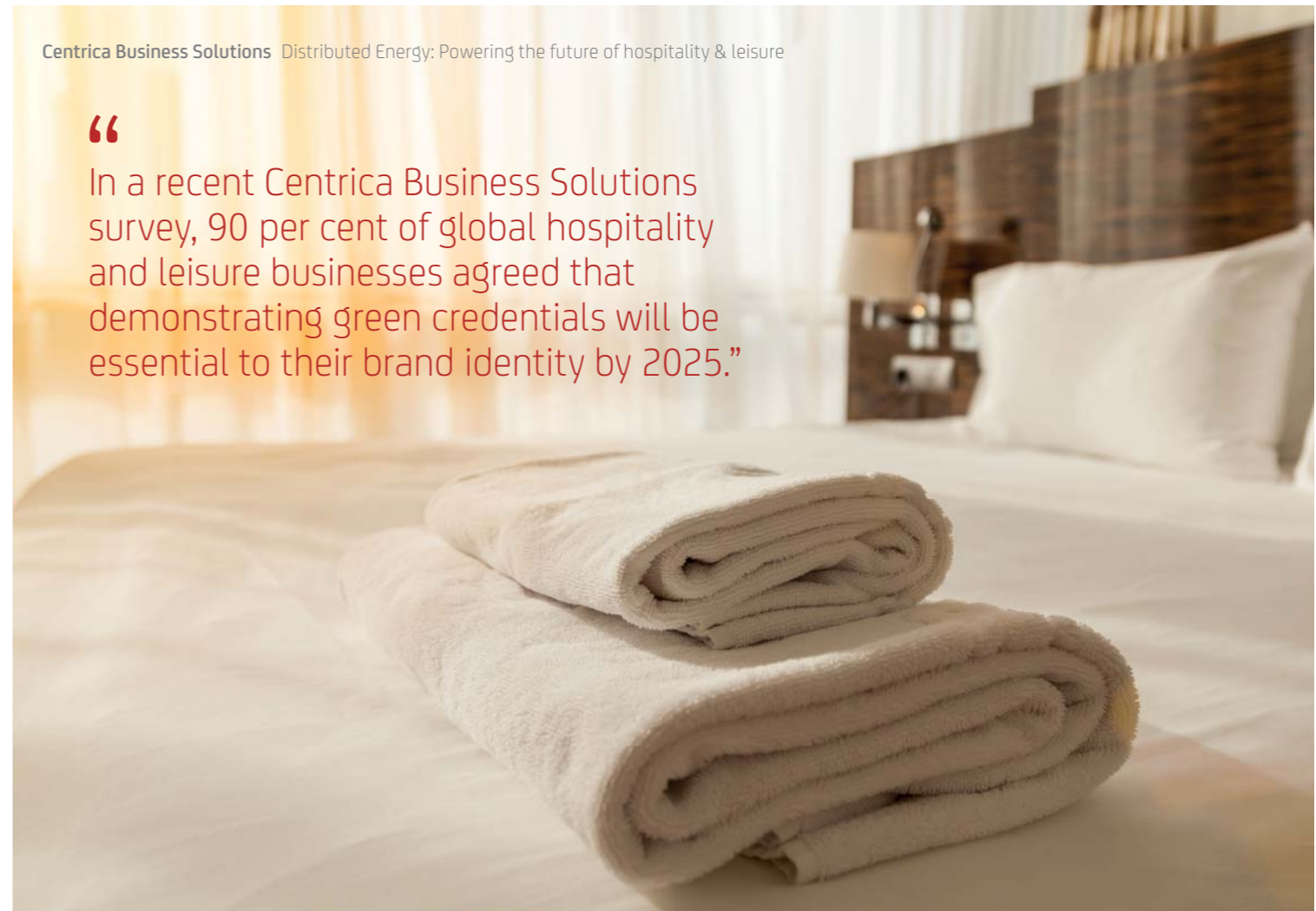
Consumer behaviour is also evolving, as they show an increasing preference for green businesses. In a recent Centrica Business Solutions survey, 90 per cent of global hospitality and leisure businesses agreed that demonstrating green credentials will be essential to their brand identity by 2025⁴.



The Carbon Trust estimates that the hospitality sector spends in excess of £1.3 billion on energy each year⁵. Heating can account for up to 60 per cent of total spend, while 25 per cent is spent on lighting. For a catering business, energy could make up between four and six per cent of operating profits. Estimates suggest that 10 per cent could be saved by making simple energy efficiency changes, while savings of up to 40 per cent can be achieved when opportunities are maximized during a refurbishment.

The sector also emits more than eight million tonnes of CO₂ a year, equivalent to the carbon emissions associated with the energy use of 2.5 million UK homes⁷. The October 2017 Clean Growth Strategy published by the UK Government has challenged businesses to improve their energy productivity by at least 20 per cent by 2030, encouraging the sector to identify ways to reduce emissions⁸.

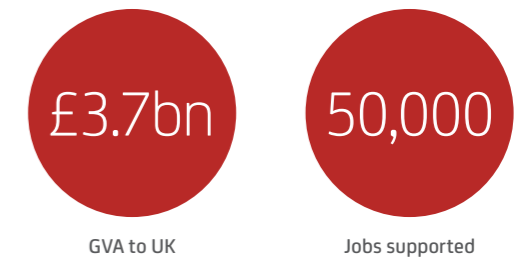
“
In a recent Centrica Business Solutions survey, 90 per cent of global hospitality and leisure businesses agreed that demonstrating green credentials will be essential to their brand identity by 2025.”



Hospitality & leisure economic benefits

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

The findings suggest that businesses could reduce energy costs by £310 million per annum. It could also create £3.7 billion for UK GVA, and support around 50,000 jobs.

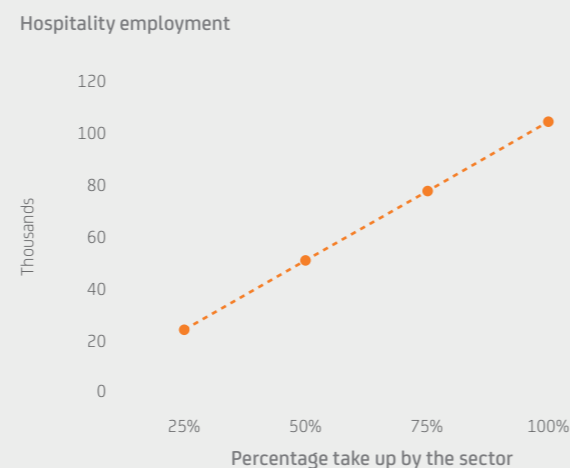
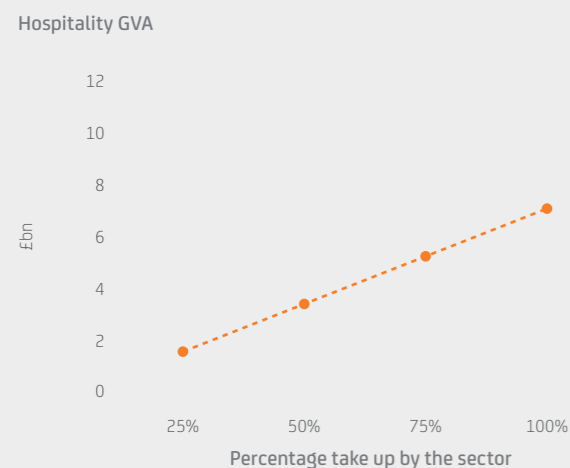


Carbon reduction benefits

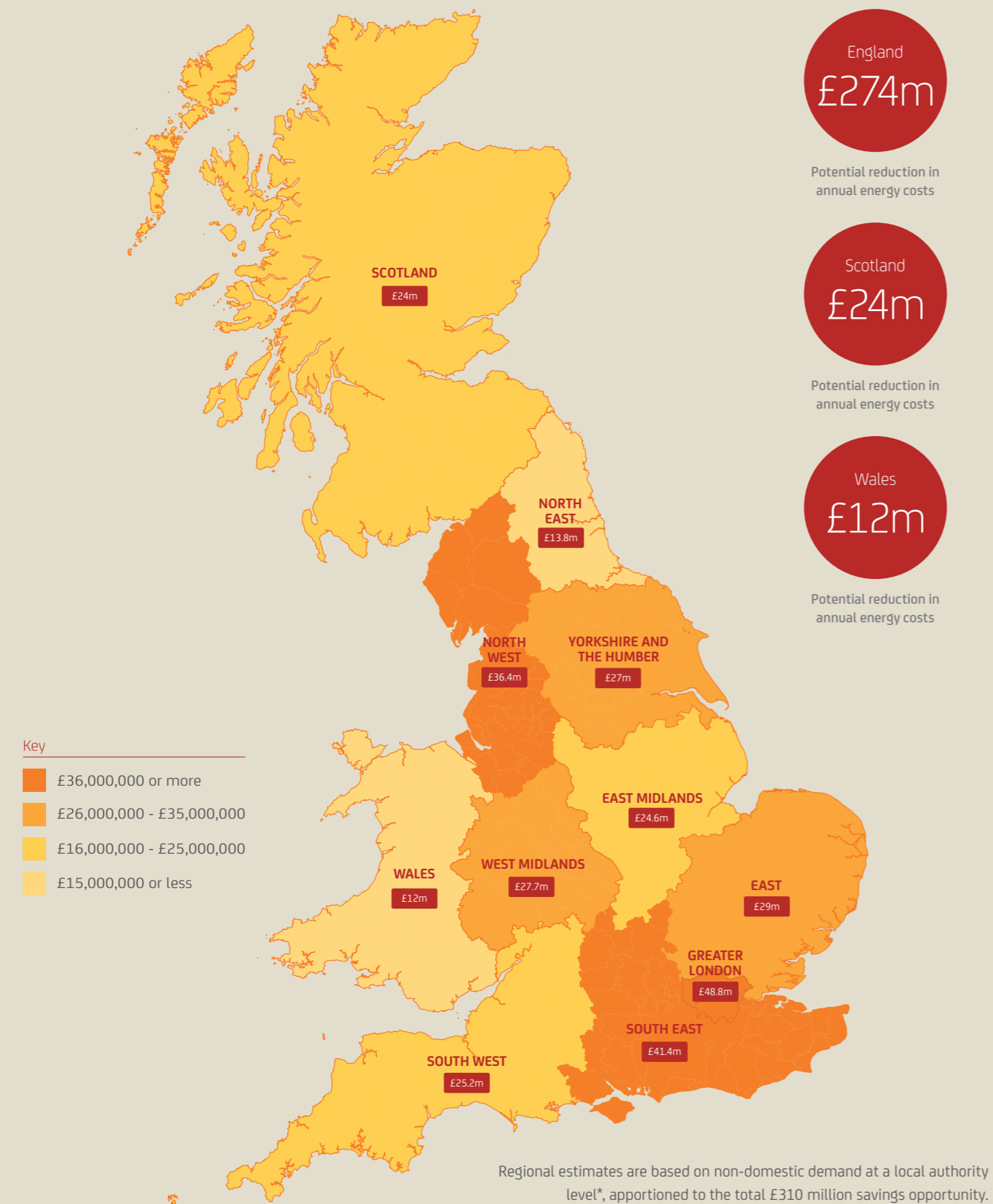
According to a Centrica analysis undertaken in October 2018, the sector could achieve annual carbon savings of 1.3 MtCO₂e by 2030 by adopting distributed energy technologies.

This is equivalent to 14 per cent of the sector's current annual carbon footprint, and represents the carbon emissions associated with the energy use of 421,000 homes. The sector could achieve total carbon emissions savings of 23 MtCO₂e by 2030⁹.

- 1 UK Hospitality, 'The economic contribution of the UK hospitality industry', October 2018
- 2 PWC, 'UK Hotels forecast 2019'
- 3 PWC, 'UK Hotels forecast 2019'
- 4 Centrica Business Solutions, Energy Advantage research, August 2018
- 5 The Carbon Trust, 'Hospitality Guide', March 2018
- 6 The Carbon Trust, 'Hospitality Guide', March 2018
- 7 A Greenhouse Gas (GHG) weathered average annual emissions of a single UK home figure of 3.09 tCO₂e has been used, based on Ofgem typical domestic consumption values (TDCVs) for 2017
- 8 Department for Business, Energy & Industrial Strategy, 'The Clean Growth Strategy', October 2017
- 9 Centrica Business Solutions, 'Distributed energy: Powering sustainability', October 2018



Breakdown of projected savings by region



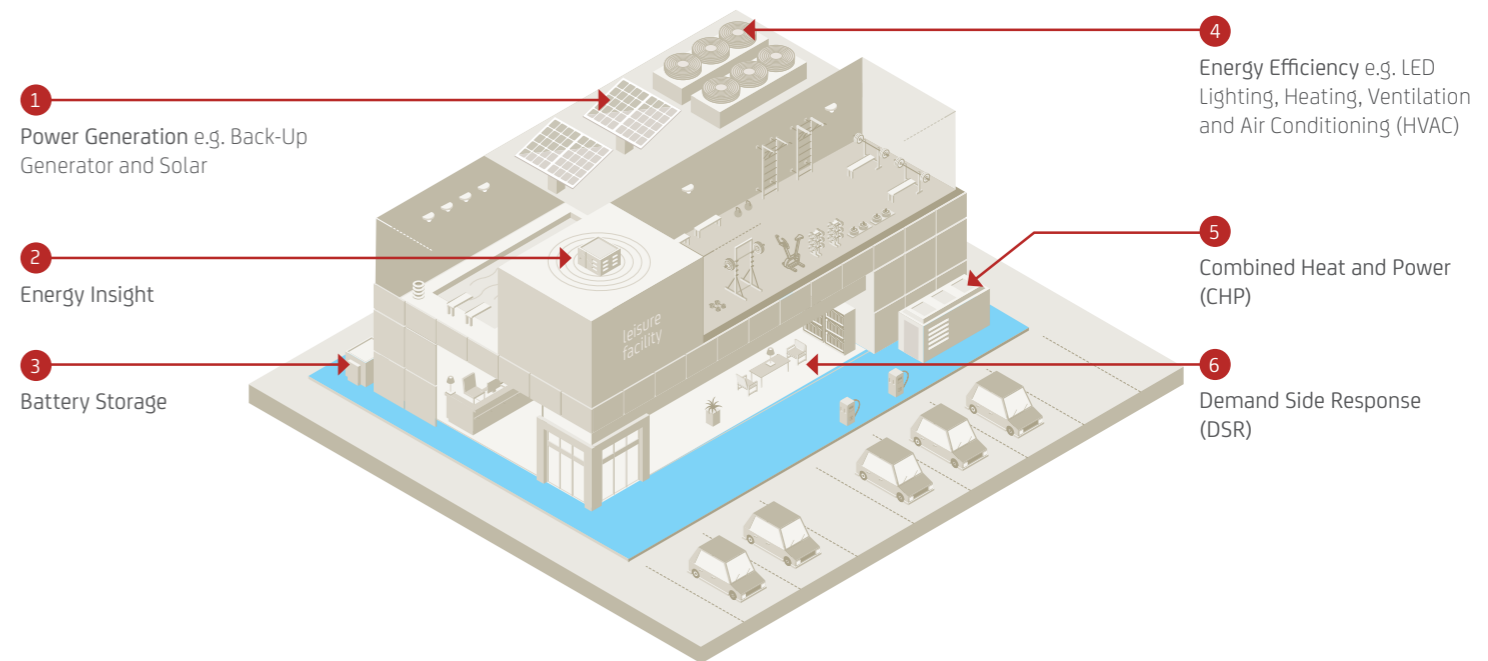
*Source: BEIS national electricity consumption statistics (2016)

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 hospitality and leisure businesses to take control of their energy and turn it into an opportunity.



1. 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.

2. 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.

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. Energy Efficiency

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

5. 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.

6. 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.

The opportunities for the hospitality & leisure sector

1 Enhance customer experiences while protecting margins

Hospitality and leisure firms are operating in an increasingly competitive market, meaning continual investment in customer experience is essential to attract and retain customers. Providing the best environment (e.g. lighting, heating and air-conditioning) within a venue is key to delivering this experience, and can have a significant impact in areas such as average customer spend and repeat visits.

Hospitality and leisure firms should look to take advantage of new, more efficient approaches to managing energy which can support the delivery of the desired environment. Insight and analytics solutions can provide early detection of equipment issues which could result in a degraded customer experience, and help identify opportunities to improve energy efficiency. On-site generation (e.g. CHP, Solar), efficiency solutions (e.g. LED lighting) and energy optimisation and storage also enable reductions in consumption and cost, which frees up capital to invest in customer experience.



84%

The percentage of global leisure respondents who agreed that energy insights will be central to competitive advantage for many large businesses by 2025¹⁰.

2 Strengthen brand reputation by demonstrating sustainability

Consumers, employees, shareholders and investors are increasingly factoring a brand's approach to sustainability into their decision-making processes. The rise of social media and peer reviews, plus increasing environmental regulation means that hospitality and leisure brands must positively demonstrate their commitment to sustainability and the environment to attract and retain customers.

To improve their sustainability credentials, firms should take advantage of new, more efficient, lower-carbon approaches to generating and managing energy. Firms also need to ensure they have in place the systems and processes that enable them to easily report on the progress they are making.

Insight and analytics solutions help businesses identify opportunities to improve energy efficiency across a facility, and more efficient and renewable technologies (e.g. CHP, Solar and storage) help reduce carbon emissions and demonstrate a sustainable energy strategy.

29%

The percentage of global leisure respondents who say they have adopted solar panels on-site at some or most of their sites¹¹.

54%

The percentage of global leisure respondents who say becoming a low-carbon/low-emissions organisation is a very important topic concerning their use of energy¹².

3 Ensure the resilience and safety of your operations

Managing financial and reputational risks is a key issue for hospitality and leisure firms as they contend with an evolving set of issues including acts of terrorism, cyber-attacks, tightening legislation and adverse weather conditions. The time-critical nature of many leisure events means that an incident that causes a cancellation or postponement can be hugely costly and cause severe damage to brand reputation and future repeat business.

In this environment, hospitality and leisure firms need to ensure that every element of their operation is completely resilient. Investing in energy technology can give greater security of supply and reduce exposure to grid failures. On-site generation (including CHP and back-up generators) and storage solutions ensure a secure and scalable supply to facilities. Sensor solutions help ensure a reliable experience for customers by enabling early detection of potential equipment failures, and effective operations and maintenance support ensures the reliability of on-site infrastructure.

68%

The percentage of global leisure respondents who agree that their organisation's reputation depends on having a consistent supply of energy¹³.

52%

The percentage of global leisure respondents who say they have adopted back-up generation/standby power on-site at some or most of their sites¹⁴.

4 Diversify operations and access new growth markets

Many hospitality and leisure businesses operate with thin margins and need to find ways to improve profitability and return on capital to satisfy shareholders all year round, particularly as markets in the UK become increasingly saturated. To maximise returns from existing locations, as well as defend themselves from the threat from new competitors, firms need to diversify their operations and generate new revenue streams.

Taking advantage of new, more agile approaches to sourcing and managing energy can support growth strategies. Renewable generation technologies, coupled with a demand-side response contract, can turn under-utilised real estate (e.g. roofs) into a revenue-generating asset.

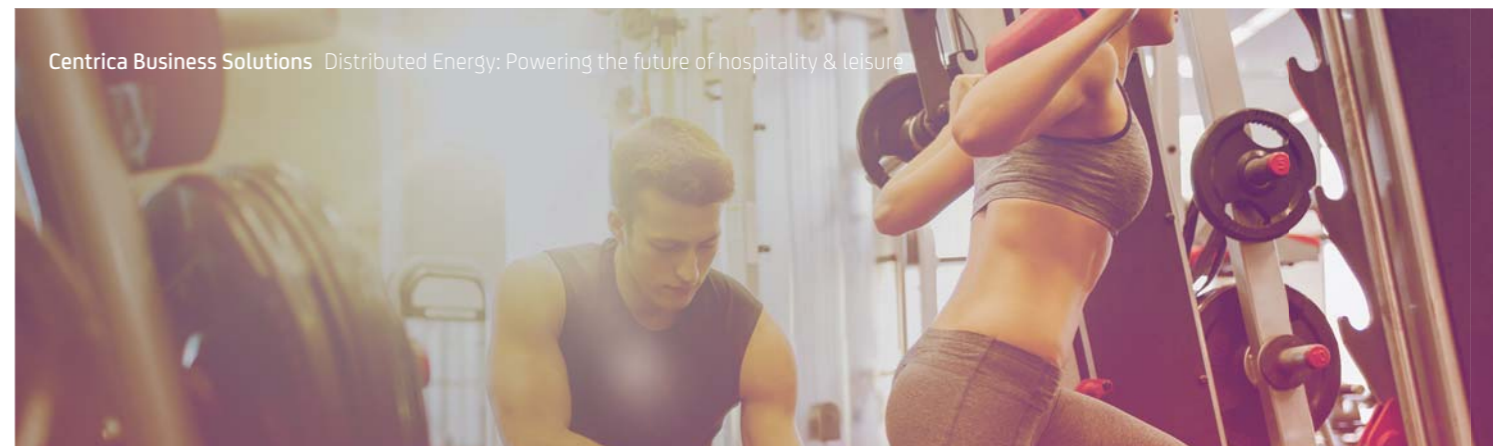
32%

The percentage of global leisure respondents who say they have adopted flexible load or demand response measures across some or most of their sites¹⁵.

^{10, 11, 12, 13, 14, 15} Centrica Business Solutions, Energy Advantage research, August 2018

Powering improved customer experience, resilience and brand loyalty for British hospitality & leisure

Centrica is helping hospitality and leisure businesses across the country to overhaul their approach to energy. From football stadiums to hotel chains, forward-thinking companies are changing their relationship with energy by installing Combined Heat and Power (CHP); efficient lighting; heating and ventilation systems; renewable technology; and building management systems.



“

Installing Combined Heat and Power units to generate electricity is the perfect way to reduce our carbon emissions, but also our operating costs. The benefits of CHP will continue as we continue to build new leisure centres.”

Chris Williams, Environment and Sustainability Manager, Places Leisure

CASE STUDY:

Driving operational efficiency with CHP

Places Leisure saves £250,000 a year, and reduces carbon emissions by over 2,600 tonnes, using Combined Heat and Power from Centrica Business Solutions.

Creating active communities

Places Leisure is a leading leisure and wellness partner, delivering consistently high-quality fitness, sport, health and wellbeing services. Working with local authorities across the country, its workforce manages a diverse range of leisure facilities that help create active places and healthy people.

In a notoriously competitive industry, Places Leisure was looking for a way to reduce energy costs so that it could invest further in enhancing customer experience. It turned to Centrica Business Solutions to find a sustainable way to create energy.

Heat and power for health and wellbeing

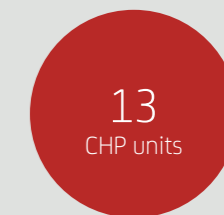
Centrica Business Solutions helped Places Leisure reduce carbon emissions, in line with Government targets. Due to the extended thermal demand from swimming pools, a Combined Heat and Power (CHP) unit was an effective and efficient option.

Centrica Business Solutions and its team of engineers installed CHP units at 13 Places Leisure facilities. The maintenance package ensures that any potential issues, either online or on site, are spotted and resolved quickly, giving Places Leisure the peace of mind that the generator will always be running.

The results

Since installing the CHP units, Places Leisure has reduced its carbon emissions by 2,600 tonnes, which is equivalent to taking 510 cars off the road for a year.

The CHP units are also saving the business £250,000 per year in operating costs. This means Places Leisure can spend more money on the things that matter most; creating safe, enjoyable spaces for the local communities where it operates.



Maintained by Centrica Business Solutions



Savings due to CHP units



Carbon emissions savings



“ We generate large amounts of electricity throughout the day, but unfortunately cannot utilise it all. With the installation of these energy storage machines, we will be able to store the energy until times when we have a higher demand.”

Shaun Hawkey, The Olde House

CASE STUDY:

The Olde House, new energy thinking

Centrica signs up first business in Cornwall Local Energy Market trial with new energy storage machines supporting The Olde House, making it the largest commercial storage system of its type in the UK.

Rewarding smarter energy decisions

The Olde House was exporting excess solar energy in the day, and importing expensive energy from the grid during peak evening times when holiday makers returned from the beach.

Capturing energy

Centrica's Local Energy Market (LEM) trial helped fund and oversee the installation of six storage machines at The Olde House in North Cornwall. The energy storage machines will shift excess solar energy to times when it is needed onsite, and the units will be connected to Centrica's new LEM software platform to trade balancing services to the Cornwall grid. The pioneering storage flow technology is the largest commercial operating system deployed in the UK to date.

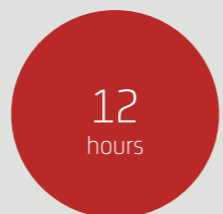
The 1MWh energy storage machines will be connected to The Olde House's 250-kilowatt solar array, which provides power to the site. The solar panels also power an onsite electric vehicle charging station, as well as 30 holiday cottages.

The engagement with The Olde House is part of a £19 million trial that will test the role of flexible power generation and storage in up to 150 homes and businesses county-wide. The trial aims to support the future development of renewables in the region by reducing grid constraints through flexible demand, generation and storage.

The results

The Olde House will significantly improve utilisation of onsite solar PV and save up to 50 per cent on peak price energy imports. Thanks to the new energy storage machines, which store solar energy from the day for use at night during peak times, it has eliminated the need for expensive grid imports. Through tracking and dynamic response to calls from grid operators for flexible services, The Olde House can also generate revenue.

Overall, it represents a huge step toward energy independence for The Olde House. Centrica's LEM team has been working to recruit homes and businesses to take part in the project since its launch in December 2016. It has already carried out energy audits at 56 business sites. Applications have come from businesses looking to access a £8.6 million funding pot to cover the cost of a variety of initiatives (including energy audits, smart technology upgrades, CHP and new energy storage units) that can help unlock money making potential and reduce energy costs.



12 hours

Total hours of storage



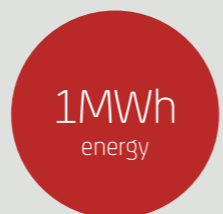
50% reduction

Reduction in grid imports during peak times



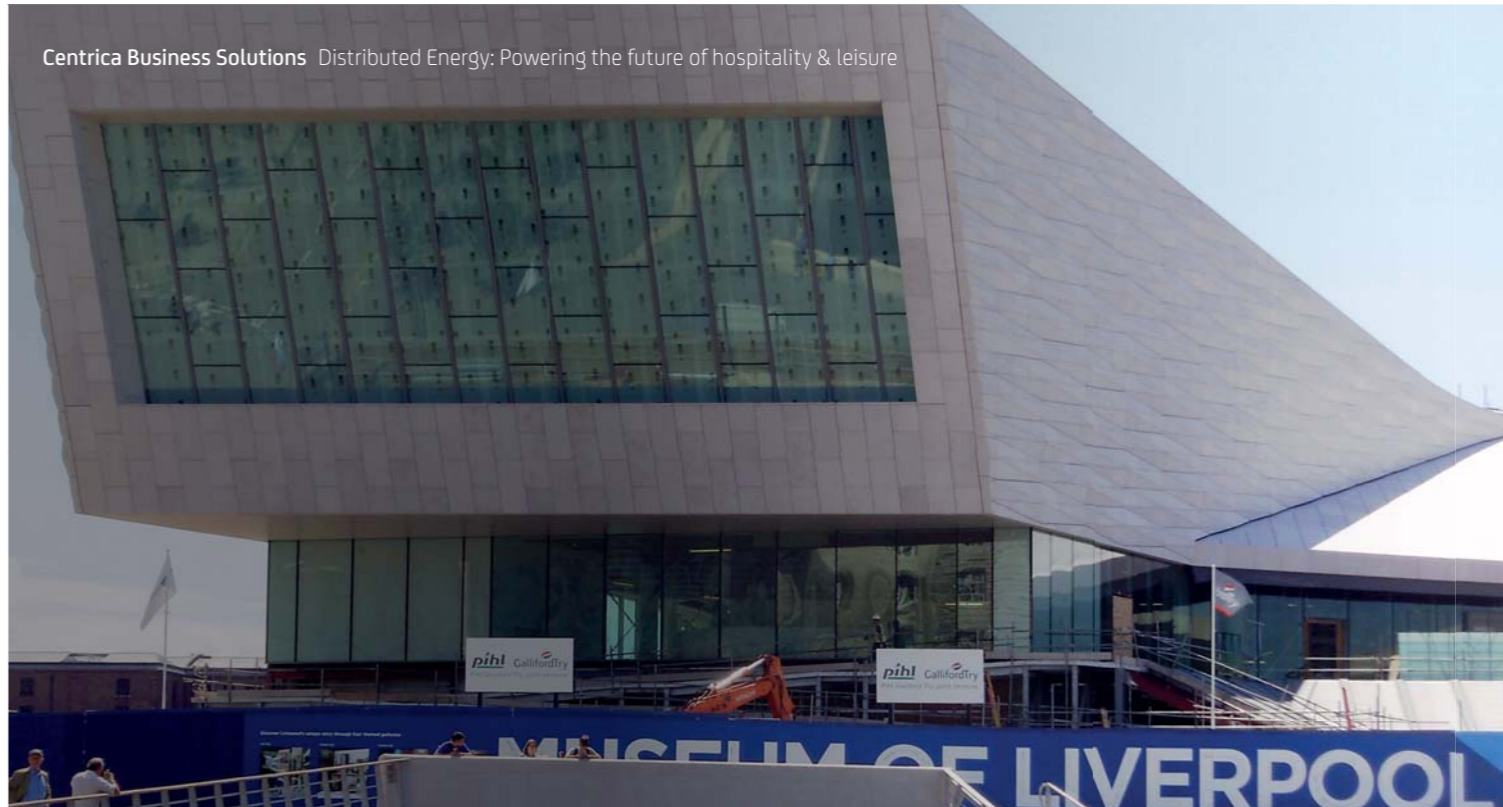
30 cottages

Providing power to 30 holiday cottages



1MWh energy

Energy storage machines connect to The Olde House's 250-kilowatt solar array



CASE STUDY:

A powerful display of energy efficiency

We're guaranteeing the Museum of Liverpool annual energy savings of more than £500,000 with Combined Heat and Power (CHP).

They were looking for a state-of-the-art solution

The new £72 million Museum of Liverpool is the largest national museum to be built in the UK for more than a hundred years. The building provides 8,000 square metres of public space across three floors, therefore there was a lot of heat generation, cool air and power to consider. Installing an ENER-G (now Centrica Business Solutions) CHP system was the best solution.

We designed a system to cut costs and CO2

To provide efficient generation to serve the museum's total energy needs, we installed:

- Two 385kWe bio-diesel ENER-G CHP units
- Two 768kWe natural gas ENER-G CHP systems
- Two 850kWe boilers
- A 1000kWe absorption chiller
- A 998kWe compression chiller

This trigeneration system allows us to create electricity and then recover the heat created to provide heat and hot water for the museum in winter, and air conditioning and chilled water in the summer.

Divide and conquer

The solution is split between a plant room in the new building and the historic Great Western Railway (GWR) Goods Shed, which we converted into a state-of-the-art energy centre with sophisticated remote monitoring and diagnostic facilities.

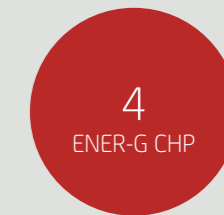
Overcoming challenges

To succeed on this project we had to:

- Design the energy centre to operate independently of the utility electrical supply
- Preserve the GWR building exterior in line with planning conditions as the site is part of a protected view

The results

The four ENER-G CHP units installed guarantee annual energy savings of more than £500,000. We are reducing carbon emissions by 884 tonnes a year – the equivalent of taking 295 cars off the road.



4 ENER-G CHP

Units fitted



£500k savings

Savings due to CHP units



844 tonnes

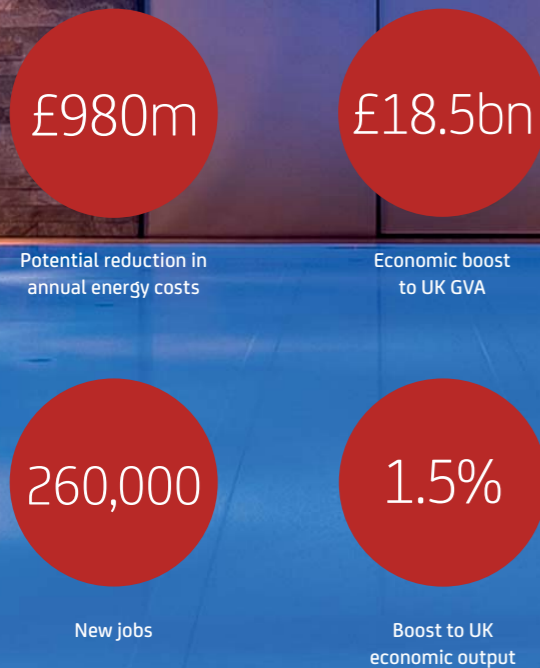
Carbon emissions cut by 844 tonnes

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 and leisure sectors.

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



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 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 5,000 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 more than £700 million in this area by 2020.

For more information: centricabusinesssolutions.com

Disclaimer

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WP-2018-52-UK-EN