Powering Performance: The Executive Guide to CHP

centrica
Business Solutions

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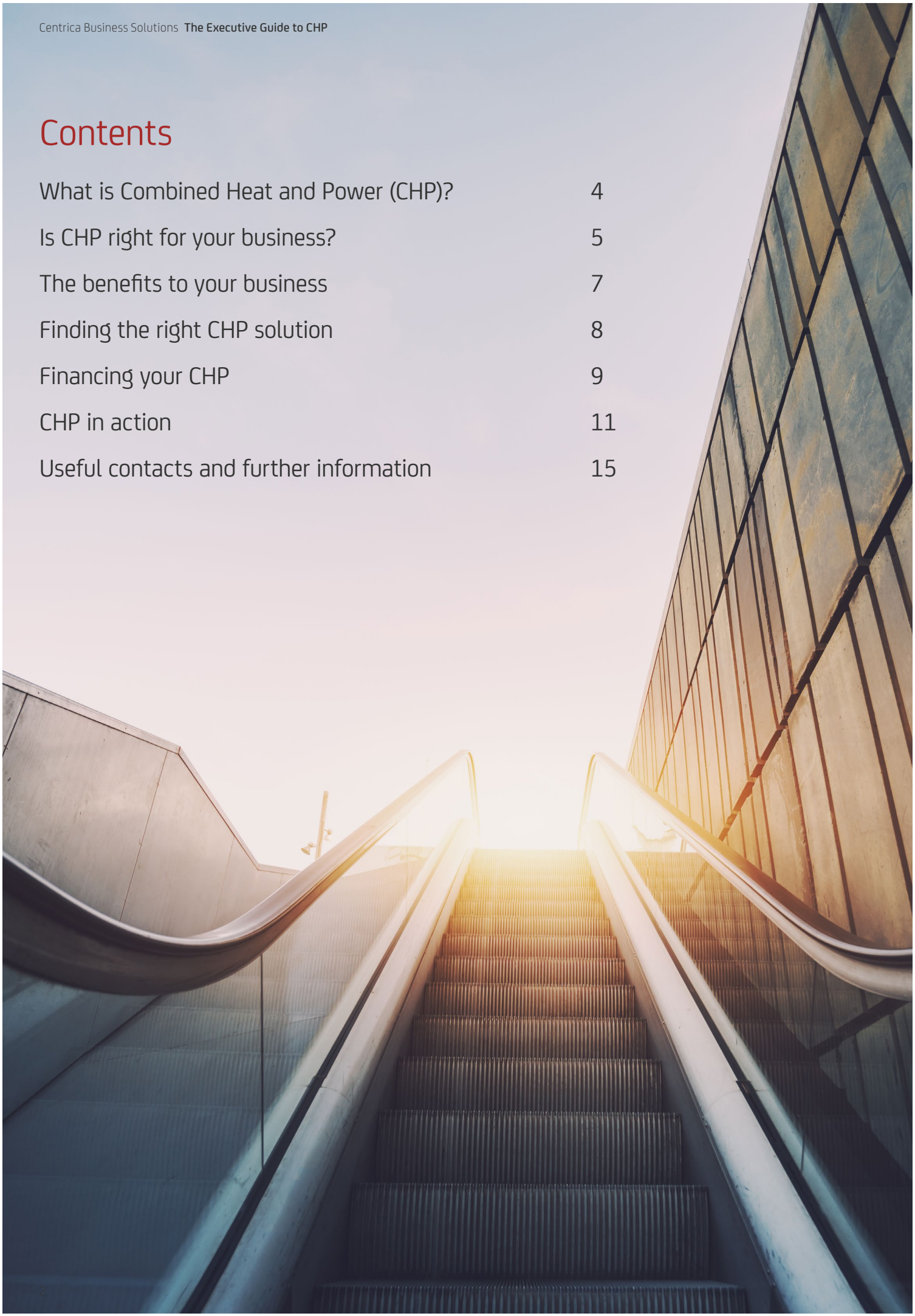


Sustainability and cost are driving the need to improve energy efficiency

The energy landscape is changing. The markets have never been more volatile, costs are escalating, there's unremitting demand for supply and businesses are under significant pressure — both financial and political — to improve energy efficiency, reduce carbon emissions and utilise renewable sources.

Businesses need to start looking for an alternative energy source — one that gives you the power to control your own energy.

56%

of CEOs see high or volatile energy costs as a significant area of concern[1]

46%

of CEOs rate resource scarcity and climate change as one of the top three megatrends likely to impact their business[2]

[1] Source: Global CEO Survey 2017, PwC
[2] Source: Global CEO Survey 2017, PwC

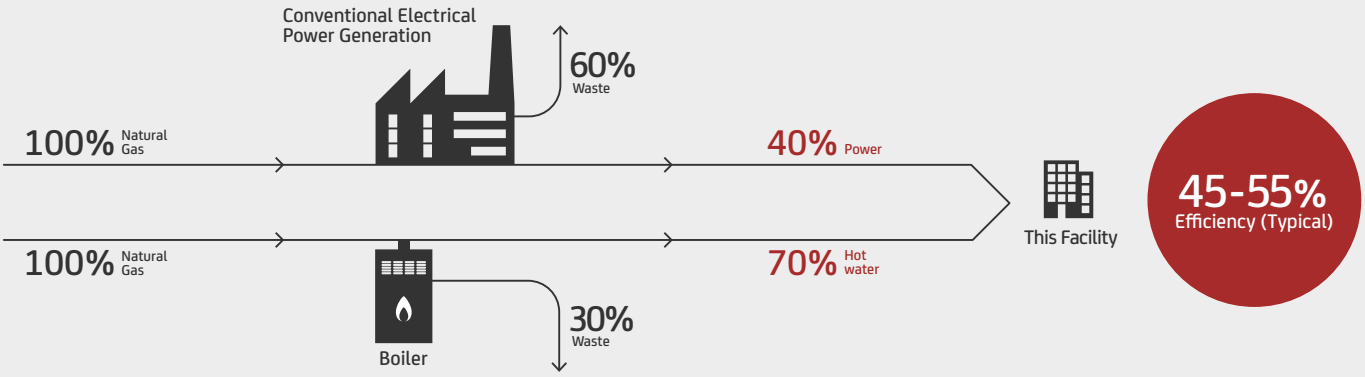
Combined Heat and Power

Combined Heat and Power (CHP), also known as cogeneration, is designed to generate electricity onsite and recover the majority of the heat created in the process, significantly reducing energy wastage.

A generator, normally fuelled by natural gas, is linked to an alternator to produce electricity. CHP maximises the fuel and converts it into electricity at around 35% efficiency and heat at around 50%. Heat is recovered from the engine by removal from the exhaust, water jacket and oil cooling circuits.

Typically, a good CHP scheme can deliver an efficiency increase of anything up to 25% compared to the separate energy systems it replaces.

Typical case



Cogeneration

Is CHP right for your business?

CHP is ideal for any business looking to:

Reduce energy usage

Lower carbon emissions

Optimise their energy consumption

But it's particularly effective for businesses who:

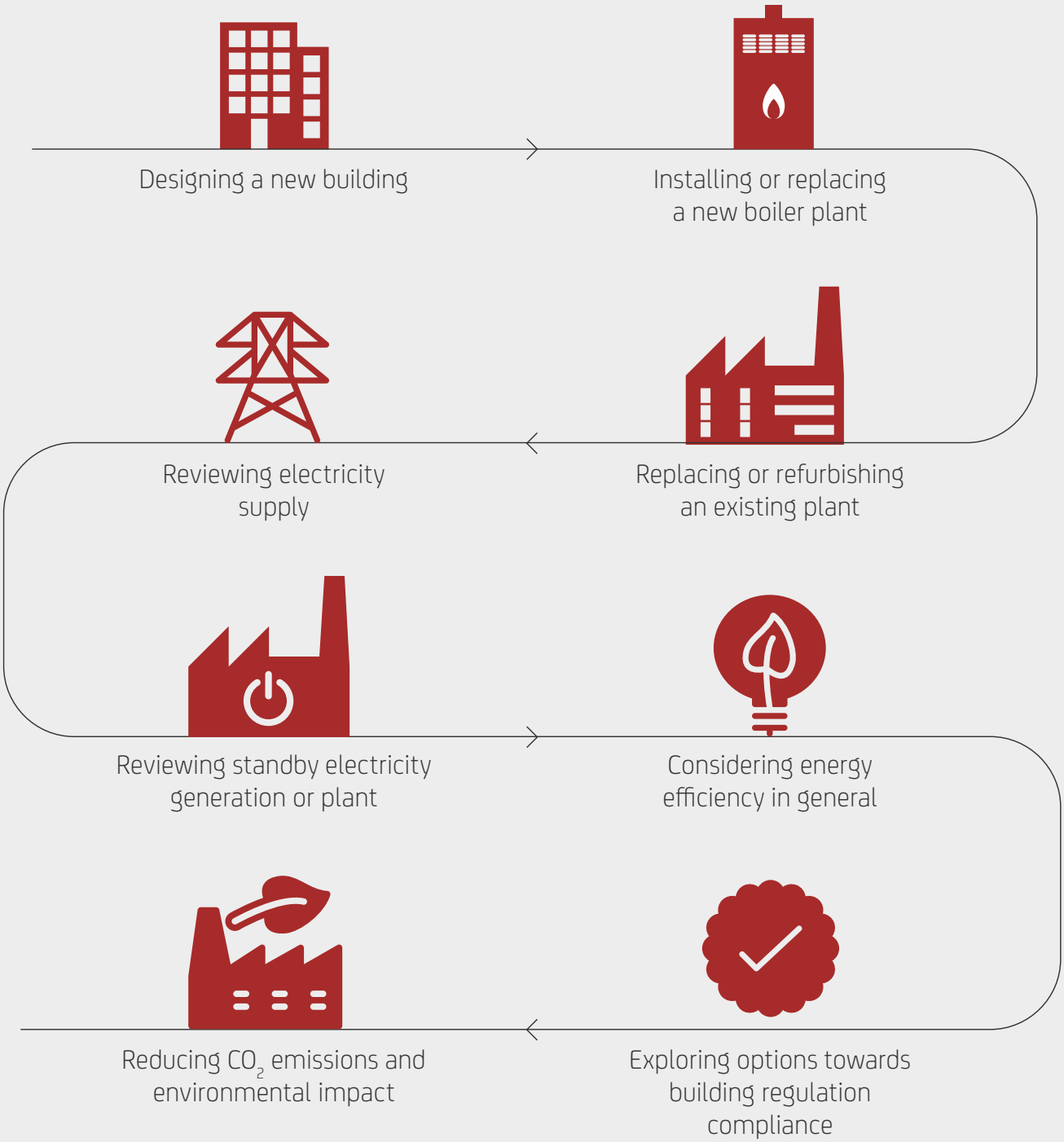
Operate for an average of 15 hrs/day

Need power as well as heat or cooling

CHP is suitable for:

- Leisure centres
- Manufacturers
- Hotels
- Pharmaceutical
- Hospitals
- Schools, colleges and universities
- Military bases
- Prisons
- Commercial premises
- Horticulture
- Airports
- Waste water treatment works
- Municipal buildings
- District heating schemes i.e. offices, residential
- Anaerobic Digestion i.e. dairy, on-farm.

CHP should always be considered when:



The benefits to your business:

A secure and stable supply
Your business can't operate without power. CHP gives you a reliable energy supply that can keep your business running, regardless of what's happening outside the gates. It can also help you keep energy levels constant – giving you a steady and stable supply that can keep your business operating smoothly.

Reduced running costs
CHP can cut your site's energy costs by up to 25%, enabling you to divert the savings to other areas of your business. We offer a variety of finance options, including zero capital outlay, so you control the cost of installation. And with payback in 3–5 years and an equipment lifespan of up to 15 years, the savings keep coming long after the technology has paid for itself.

Stronger compliance
CHP can help you reduce your energy consumption and emissions, supporting your compliance efforts. It can also help you gain valuable government incentives.

Finding the right CHP Solution

The size of your CHP solution needs to be carefully determined. If the selected CHP unit is too small then the maximum savings won't be delivered. If the selected CHP unit is too large then the CHP unit will be operating inefficiently at part-load, have fewer run hours and lower utilisation figures.

3 Stages to CHP

There are three stages to determining the viability of CHP.

Data collection

Of electricity and gas consumption

Initial feasibility study

A desktop calculation to understand the feasibility of the project

On-site review

To determine installation options and cost

Speak to Centrica Business Solutions to understand more about the economic viability of CHP for your business.

Financing a CHP project

Centrica Business Solutions offer a range of finance options that can be tailored to the individual requirements of each project. We partner with you to make sure you get the right solution for your business - regardless of the project size, cost or complexity.

1. Discount energy purchase (DEP)	Centrica Business Solutions funds all, or a proportion, of the implementation costs. They then recover both the initial capital costs and the ongoing maintenance charges over a contractually agreed period, usually 10 years, by charging a p/kWh rate for the electricity generated by the CHP plant.	**Benefits:** • No capital outlay • Centrica Business Solutions fund, supply, install, operate and maintain the equipment • Fast implementation and immediate savings • Long-term, capped energy costs • Heat generated by the CHP is provided without charge • Immediate savings
2. Capital Purchase	A fixed-cost complete turnkey solution — includes project design, supply, delivery, installation and commissioning. A service package can also be included to operate and maintain the system throughout its lifetime. This can also allow businesses to be eligible to claim a 100% first year capital allowance on energy efficiency investments against taxable profits during the period of investment.	**Benefits:** • Customers receive the full financial benefit of the energy savings • Equipment owned by the customer • Savings can be invested elsewhere in the business • Payback typically 2-5 years • Full operation and maintenance contracts available • Eligible for incentives e.g. CHPQA • Remote monitoring to ensure optimised operation available • Freedom to source finance or use internal funds • Align spending with budget cycle
3. Energy savings agreements (ESA)	An agreed fixed monthly fee paid to Centrica Business Solutions. This fee is covered via the savings generated from CHP. As a result, the net cost to the customer is typically zero. Typical contract length of this agreement is 10 years. This is often the preferred funding method to use as part of a wider energy improvement plan as it can incorporate other technologies or services within the agreement.	**Benefits:** • No capital outlay • Upgrade some or all of your infrastructure • Immediate reduction in energy costs • No maintenance costs • Savings or other performance guarantees

Why CHP from Centrica Business Solutions?

Centrica Business Solutions have extensive experience in the sector, having recently started production on our three thousandth CHP unit.

But we're also an all-round energy partner who can not only help you implement resilience solutions, we can also provide you with insights into where the problem areas of your energy usage lie – helping you turn energy from a cost and potential business risk into a source of sustainable competitive advantage.

We work with you in partnership from the beginning, helping you find the best energy solution for your site. CHP could become part of a total solution to maximise your energy savings and efficiency — and even help you generate revenue from your energy usage.

Centrica Business Solutions are at the forefront of changing how the world uses energy, how it impacts the energy market and what it means for your business. No one knows energy better than we do, so you have the reassurance of our extensive industry experience, knowledge and a world-class operation.

ENER-G CHP in action

Alton Towers
Reducing costs, improving sustainability

Better performance

The 550-acre Alton Towers site includes a conference centre, four hotels that can accommodate 2,500 guests, and Europe's largest waterpark – which needs to heat 1,000m^3 of water and pump 66m^{3}of air/second.

Centrica Business Solutions provided a consolidated package, acting as manufacturer, installer and service provider. A CHP unit was installed on site, alongside the waterpark, generating up to 850kW. If there are any issues with the CHP, Centrica support ensures they are dealt with quickly – and the unit returns to peak efficiency.

Right result

The CHP unit generates power at source so energy efficiency has increased to 80%, and with a direct lowering of the resort's carbon levy, there is the added attraction to investors of a more sustainable business. Centrica Business Solutions funded the unit and installation, saving the resort's capital budget, which allowed it to invest in customer-facing attractions.

ENERGY SAVINGS OF
12%
PER ANNUM

80%
ENERGY EFFICIENCY

ENER-G CHP in action

Newcastle United
Fielding a premier league carbon footprint

REDUCING CARBON EMISSIONS BY **390** TONNES A YEAR WITHOUT CAPITAL OUTLAY

EQUIVALENT TO **320** ACRES OF FOREST BEING PLANTED

Better performance

The club were already offsetting more carbon than they emitted through boiler optimisation, burner management, lighting upgrades, smart building and energy monitoring. But to take their carbon saving to the next level, they needed a permanent, cost-effective solution.

Due to the space constraints of the stadium, we delivered their new CHP system in parts and rebuilt it in situ.

Right result

The ENER-G CHP unit is now helping the club reduce their CO_2 emissions by an additional 390 tonnes per year. And thanks to the cloud-based monitoring system which provides a two-way communication channel between the unit and service centre, we can monitor the energy levels in real time to make sure the club are always getting the best performance.

ENER-G CHP in action

Royal Stoke University Hospital
Cutting costs and emissions with surgical precision

REDUCING CARBON EMISSIONS BY
2,792
TONNES A YEAR

EQUIVALENT TO TAKING
991
CARS OFF THE ROAD

A major operation

As Europe's biggest employer, the NHS contributes about 8% of England's total CO_2 emissions and the government's Carbon Reduction Strategy has committed them to reducing emissions by 60% by 2050. So there's a compelling need to implement carbon reduction technologies.

Royal Stoke University Hospital (RSUH) wanted to lower their emissions and cut energy costs at their main site, which provides acute services for about 500,000 people. They received a share of the £50 million fund to cut NHS energy consumption to install a new ENER-G CHP unit on the site.

Ongoing treatment

The unit will reduce the hospital's carbon footprint by 95 tonnes a year – almost 8% of the Trust's entire current output. RSUH have also taken out a fully comprehensive operations and maintenance package, which includes 24-hour remote monitoring, a dedicated site engineer and all-inclusive parts and labour from Centrica.

Want to know more?

Contact us by phone: +44 2036 375 370
or email: CentricaBusinessSolutions@centrica.com
or view our website at centricabusinesssolutions.com/performance

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