Energy costs down, resilience up

Derriford Hospital in Plymouth is ready to save over £228,000 a year on its energy bills thanks to British Gas's installation of a new CHP unit, the energy supplier says.

The 1.5 MW unit will produce 49% of the hospital's power needs and 9% of its heating. It was installed as part of an Energy Performance Contract (EPC) with British Gas that aims to reduce Plymouth Hospitals NHS Trust's £3.5m annual energy spend by 10% over its 15-year lifespan, and cut over 1,800 tonnes of carbon emissions annually.

The nine-month installation, which was completed in October 2014, was 'fairly complex'; clear, unhindered access had to be maintained to the hospital's Platelet Collection Centre, and connections to the hospital's electricity and heating supplies made without interruption. Crane access was particularly challenging, with the CHP unit located close to the hospital's air ambulance landing site.

The plant is already making 'a significant contribution' to the Trust's heating and electricity supply. Nick Thomas, director of site services, said: "The CHP unit is already considerably reducing our energy costs. In the future, this will provide extra resilience to our electricity supplies, and will be a major step towards meeting our target of reducing carbon emissions by 30% over the next five years."

Lister's demand response solution

East and North Hertfordshire NHS Trust selected KiWi Power in 2012 as its demand response (DR) partner for the Lister Hospital, Stevenage.

Demand response (DR) allows sites to reduce their energy demand on the National Grid by turning down non-essential systems, such as lighting and air-conditioning, or switching to on-site generation for short periods during peak demand. This reduction in power enables cost savings, but, through inclusion in an aggregated DR programme with KiWi Power, the hospital generates significant additional revenue for its participation.

KiWi Power said: "Lister Hospital, like many hospital estates, is a perfect candidate for DR, with on-site diesel generators and a CHP providing additional capacity for export back to the Grid. The site now generates well over £100,000 in revenue annually from DR participation and peak tariff avoidance (Triad Management)."

The hospital has a 5 MVA, duplicate 11 kV feed from UK Power Networks (UKPN), fully supported by four Perkins 2 MVA, LV diesel generators and a CHP, which feeds the 11 kV hospital distribution system. During DR events, the diesel generators export electrical load onto the local UKPN distribution network – a process initiated using GPRS technology with no interference to Lister's IT systems, and a turnkey, remote start control solution from KiWi Power. The technology's integration with the SCADA & PLC systems at the hospital allows KiWi to control the generators remotely. KiWi operators monitor performance via the engine telemetry and one-minute resolution smart metering at the KiWi Control Centre in London.

Further benefits include no cost implementation, and reduced CO_2 emissions from the UK grid.

'Near-zero' emissions profile

Capstone MicroTurbine CHP and CCHP solutions are said by UK distributor, Turner EPS, to "reduce energy costs, ensure power availability, and help preserve the environment with their 'near-zero' emissions profile".

The company said: "Derived through advanced engineering based on proven turbine design, microturbines represent a watershed energy management solution. To produce 120 kW of hot water using 65 kW of electricity in a CHP application, Capstone MicroTurbines require 230 kW of fuel. To achieve the same electricity and hot water outputs, some traditional energy sources use up to 33% more fuel." In fact, Turner EPS maintains, microturbine-powered CHP and CCHP applications increase energy efficiencies 'from about 28%, to greater than 80%'.

The company added: "As microturbines generate clean-and-green electricity, they produce exhaust heat. With CHP and CCHP, the waste heat is captured, rather than released to the atmosphere. This thermal power is then used to heat the building, provide warm water for laundry, or heat swimming pool water."

In a CCHP application, an absorption chiller added to the system turns waste heat into a cooling source most commonly used for air-conditioning, further boosting energy efficiencies, since less utility power is needed. Steam can also be produced as a by-product of the microturbine exhaust through the absorption chiller, which can, for example, be used as part of a hospital's sterilisation or cleaning process.

Report reveals CHP's carbon-saving benefits

ENER-G has released its annual carbon reduction report, which shows that in 2014 its combined heat and power (CHP) customers reduced their carbon footprint by a total of 371,578 tonnes.

The company, which claims to be Europe's leading small-scale CHP system provider, says this annual saving equates to the environmental benefit of removing 123,859 cars from the road each year.

ENER-G CHP customers reaping the rewards of 'going green' include the NHS, Glaxo SmithKline, Adams Foods, David Lloyd Leisure, Tesco, Sainsbury's, Morrisons, and major hotel groups, together with the British Royal Family, which reportedly uses CHP technology at Buckingham Palace and Windsor Castle.

Heather Foster, head of Operations, said: "At a time of high energy bills, those organisations using CHP are saving money, as well as reducing their carbon footprint. By generating their own secure supply of heat and power, they can also protect themselves from power outages and the disruption caused by network failures."

ENER-G says CHP achieves cost savings 'of up to 40% over electricity sourced from the grid and heat generated by on-site boilers'. Typical payback on the technology is between three and five years, with most CHPs having a product lifecycle of 15 years or more.

Energy centre's £12.7 m savings guarantee

York Teaching Hospital NHS Foundation Trust has officially opened its new CHP energy centre at York Hospital with a ribbon cutting by its chief executive, Patrick Crowley (pictured, right), who was then presented with a plaque by Ian Whitelock (left), Vital Energi's joint MD.

The Energy Centre is promised to save £12.7 million and almost 45,000 tonnes of CO_2 during its 15-year lifecycle; all savings have been guaranteed by Vital Energi under an Energy Performance Contract.

Ashley Malin, project development director, Vital Energi, said: "York Hospital had a clear desire to reduce both its carbon output and its energy spend, taking positive steps to improve the environment and save money, which can then be spent on frontline clinical care. By guaranteeing these savings, the Trust can now be 100% confident that this project will deliver day in, day out."

The principal component of the installation is a new CHP unit. Carbon emissions are projected to be cut by 22%, or 2,996 tonnes a year. The £4.6 m project will also generate annual financial savings of £848,000.

Vital Energi has also won contracts from the Trust to provide energy conservation measures and energy centres at both Bridlington Hospital and Scarborough Hospital. All projects have been won through the Carbon and Energy Fund Framework.

Developed with Volkswagen

Baxi-SenerTec says specifiers 'under increasing pressure to reduce carbon emissions' are being given 'a new roadmap' for generating their own electricity, as the CHP specialist unveils a new offering developed in partnership with a major automotive manufacturer.

The SenerTec Dachs Pro 20-ST is powered by a purpose-built, four-cylinder, low NOx Volkswagen engine, 'and built for years of continuous running'. It delivers 19.2 kW of power and 36.1 kW of thermal energy, and has a reduced footprint.

The unit operates with natural gas, and is easily integrated with existing heating systems, making it suitable for both retrofitting and new-builds. In addition, the Pro 20-ST is 'virtually silent', with noise levels at less than 50 dBA.

While said to be easy to install, SenerTec UK can give expert design and installation advice 'to achieve maximum operating efficiency and CO^2 savings'.

Remote monitoring via the DachsPortal allows access to information such as hours of operation, generated electrical and thermal energy, and quantity of fuel.