

Case Study: Royal Shrewsbury Hospital



ENER-G Combined Power provided the catalyst for 'model' energy efficiency measures at NHS Trust

The Combined Heat and Power (CHP) scheme at Royal Shrewsbury Hospital has enabled the hospital to save more than £780,000 a year, simultaneously shrinking its carbon footprint by some 2,000 tonnes annually.

These and other improvements are the result of a 1150kWe trigeneration system, financed and installed by green energy specialist ENER-G Combined Power. Shrewsbury and Telford NHS Trust commissioned the new CHP system after an audit in 2004 showed the primary energy intensity (PEI) of the hospital was around 100GJ/100m³ – significantly higher than the NHS target of 55 – 65GJ/100m³. Issues included: an elderly inefficient boiler plant; temperatures being too high throughout the hospital; different and mismatched HVAC control systems, and, aged lighting systems. Additionally, the district heating main was asbestos lagged and needed replacing.

CHP was quickly identified as the best way of improving the hospital's energy efficiency, while boosting its prospects of obtaining grant funding

for part of the project. As well as seeking a supplier of technology, the Trust was also keen to:

- maximise savings through innovation and reduce the maintenance backlog
- transfer risk from the Trust
- secure grant funding
- create a self funded, cash neutral scheme
- avoid inclusion in the EU ETS

Andy Hudson, of the Trust's capital team, said: *"the deal with ENER-G Combined Power makes the hospital trust a model for others in the NHS to follow. I would like to see this as a demonstration site for what can be achieved in terms of energy savings and improvements to the patient environment."*

ENER-G Combined Power helped obtain a Community Energy grant of £547,000 – the largest achieved within the NHS. Further advantages were provided by the fully funded package based on a 15 year term public private partnership.

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The Trust's aim of staying outside the EU ETS was met by an innovative scheme that involved splitting ownership of the plant, leading to more advantages such as VAT savings and Enhanced Capital Allowances, normally unavailable to public bodies.

The scheme has enabled over 5,000 light fittings to be changed to improve the quality of the lighting and at the same time save 350 kilowatts of electricity. The site's mismatched control systems have also been replaced with a single SeaChange state-of-the-art Energy Management System. One of the most popular benefits is the improvement in comfort throughout the hospital. Temperatures had typically been around 27°C, but after the changes, ward temperatures are now down to acceptable levels.

The Caterpillar 1150kWe gas engine CHP at the heart of the system provides both medium temperature hot water and steam. This is supplemented by a new composite boiler and two dual fired boilers, one of which was also replaced as part of the ENER-G solution.

The scheme has come to fruition without costing the Trust a penny. Andy Hudson added: "ENER-G was the only supplier that would guarantee us savings and this is a marriage between the company and the trust. They have brought their expertise to the table with a future-proven system and we have formed a solid partnership with them."

Another innovation saw the creation of a chilled water (CHW) ring main. This linked a variety of chilled water plant, including the new 700kWe absorption chiller, installed as part of the CHP scheme, helping to secure the supply of chilled water throughout the hospital, allowing



ENER-G's CHP system at Royal Shrewsbury Hospital

maintenance of all chillers to be carried without affecting patient care. The entire scheme went live in spring 2007 and has exceeded expectations in terms of both cash savings and emission reductions.

About ENER-G

ENER-G develops, delivers and finances sustainable energy solutions and technologies on a business to business basis worldwide.

We offer a "one-stop-shop" for all commercial and industrial energy requirements, from cogeneration, renewable electricity generation from biogas, heat pump technologies, efficient lighting, controls, metering and data solutions and energy from waste.

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The benefits of CHP in the healthcare sector:

- Offers financial savings over conventional energy supply
- Avoids Climate Change Levy
- Primary energy savings deliver lower energy bills
- Higher efficiency offers reduced greenhouse gas emissions offsetting the impact of the Carbon Reduction Commitment
- Greater security of supply and plentiful hot water
- Flexible procurement options
- Zero CAPEX required
- VAT savings
- Incorporate Enhanced Capital Allowances otherwise denied by the public sector
- Possible grant funding

