

Case Study: Solihull Hospital



Hospital chooses trigeneration scheme to reduce carbon and costs

Solihull Hospital, managed by The Heart of England NHS Foundation Trust, is utilising combined heat and power technology and expertise from ENER-G to cut carbon dioxide emissions by 45% and generate cost savings.

The £5.7 million ENER-G trigeneration system creates low carbon electricity, together with steam or hot water for winter heating, and chilled water for use in the air conditioning systems during the warmer summer months.

The combined heat and power system will generate annual cost savings of £293,000, without any capital investment. The low carbon power generation system will also cut annual carbon dioxide emissions by 1,920 tonnes – the equivalent environmental benefit of a forest of 192,000 trees.

Solihull's trigeneration project was the catalyst for an ambitious project by ENER-G to de-steam the site, involving a strategic refurbishment of the site's electricity, heating and cooling infrastructure. The Solihull Hospital previously produced steam

in a central boiler house that delivered the means to heat, ventilate and provide domestic hot water through the hospital buildings.

However, the infrastructure was, inefficient, and the distribution pipework was expensive to maintain and prone to leaks. The central boiler house plant was also at the end of its useful life and unreliable. So the Trust took a bold decision to de-steam the site and cut back on energy costs, while improving interior climate comfort for patients, staff, and visitors.

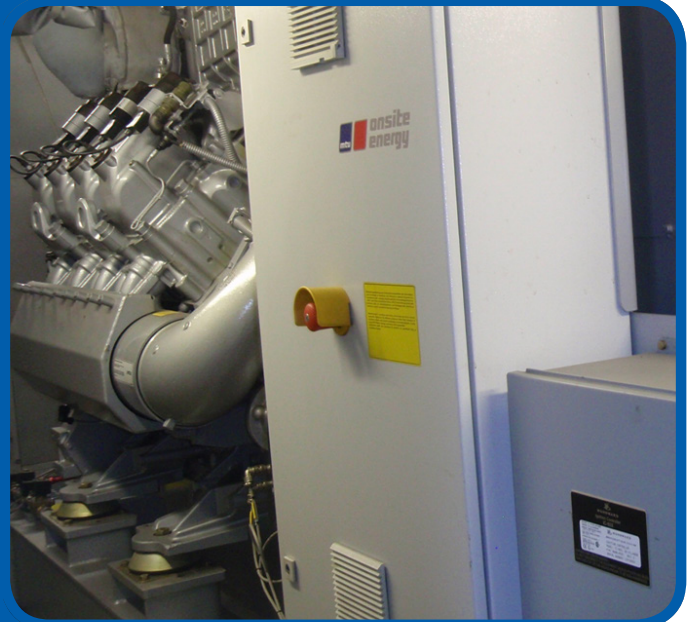
The steam boiler system was replaced with distributed gas-fired boilers as well as new distribution circuits, heat exchangers to interface with the existing heating services, and replacement steam frost coils in the air handling units.

The new system is designed with a central trigeneration natural gas Powered MTU CHP unit, providing 770kWe to the site HV ring, together with heat to new ring mains, or a 340kW absorption chiller. As part of the programme, three new mains gas supplies have been installed.

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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



ENER-G's combined heat and power (CHP) technology is also used at sister hospital Birmingham Heartlands, which has reduced its primary energy consumption by 21%; CO₂ emissions by 42% and its energy spend by 24%.

Stuart Lane, Senior Project Manager for the Heart of England NHS Trust, said: *"The Trust is taking positive steps to create more energy efficient hospitals and provide our own source of low carbon, secure power. Reducing our emissions will save us money in the long term, which can be re-invested in patient care. This is an added bonus on top of the positive contribution to the sustainability agenda."*

Graham Meeks, director of CHPA, added: *"This trigeneration scheme is a text book example of the substantial cost and carbon savings CHP can unlock across the public estate. These cost savings free up budget to help safeguard and improve delivery of front-line public services at a time of unprecedented fiscal constraint. The benefits of an innovative approach to energy management offered through*

energy services contracts, such as those delivered for Solihull Hospital, clearly stack-up."

The Solihull project was partly financed by the Government's Energy and Sustainability Fund with the majority of funding provided by the Co-operative Bank.

It was structured around the principles of a Public Private Partnership scheme under an Energy Services Contract which involves ENER-G providing the trust with a guaranteed level of performance for the system over a 15 year period and commitment to maintaining the technology over this period.

In its Carbon Reduction Strategy, the NHS Sustainable Development Unit (SDU) states that CHP offers the health service the biggest carbon dioxide saving potential, with the possibility of achieving annual savings of 232,331 tonnes of carbon dioxide and £49 million cost reduction, if installed in acute trusts.

Combined heat and power (CHP) – the simultaneous generation of electricity and useful heat - is almost twice as efficient as

conventional power generation as the majority of heat is recovered and used on site, rather than wasted into the atmosphere. The Typical pay back period on CHP technology varies between two to four years.

ENER-G delivers small-scale 10kW to 10MW CHP solutions to customers around the world and it offers the broadest product range on the market, incorporating more than 1,400 installed cogeneration systems across the globe – powered by natural gas, biogas, diesel, biogas, propane or biodiesel.

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