

Case Study: Birmingham Heartlands Hospital



A £5 million energy efficiency programme has been switched on at Birmingham Heartlands Hospital and is expected to save £688,000 a year, reducing carbon emissions and boosting resources for patient care.

The combined heat and power (CHP) scheme delivered by ENER-G enables the hospital to generate its own electricity in a purpose designed Energy Centre, cutting emissions of CO₂ by 5,600 tonnes per year – the equivalent of a forest of 560,000 trees – as well as reducing other harmful green house gases such as Sulphur Dioxide.

Birmingham Heartlands is a major general hospital managed by Heart of England NHS Foundation Trust in Bordesley Green, East Birmingham.

At the heart of the scheme is a new, aesthetically designed Energy Centre located near the hospital's landmark main entrance. The new Energy Centre, which was installed by ENER-G Combined Power, replaced ageing coal fired boilers which had served the Trust well for many years.

The new system comprises a state-of-the-art gas fired 'trigeneration' system that creates electricity, steam or hot water for the winter heating and chilled water for use in the air conditioning systems during the warmer summer months.

Improving the chilled water system has allowed cool air to reach parts of the hospital that were not previously serviced, increasing comfort for patients as well as hospital staff.

"We were attracted to this new system as not only will it save money and conserve resources, but it also complies with government targets to cut down carbon emissions and damaging greenhouse gas."

Geoff Fox, Facilities Manager of Estates
Heart of England, NHS Foundation Trust

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The £5 million programme, financed by ENER-G was structured around the principles of a Public Private Partnership contract, and included a £403,000 grant from the Carbon Trust under the Government's Community.

Energy Programme. ENER-G provides the trust with a guaranteed level of performance for the system over a 15 year period.

ENER-G installed and maintains the purpose-built Energy Centre that houses a highly efficient combined heat and power system (CHP) plus other plant including steam raising boilers and an absorption cooling system.

The CHP system generates electricity and recovers the majority of the heat created in the process. In conventional power stations this heat is simply wasted into the atmosphere through power station cooling towers; much energy is also lost along the many miles of electrical distribution cables needed to bring the power to site.

Instead, by using CHP to generate electricity on site the heat is used to provide heating, steam and hot water for the hospital in the winter, and, via the absorption cooling system, to also provide chilled water for air conditioning in the summer months.

The new Energy Centre accommodates an 1,165 kilowatt CHP unit that uses an MTU gas engine. Chosen due to its compact and efficient design, this is capable of producing steam and is connected to the hospital's main heating system. This unit is also connected to a 300 kilowatt absorption chiller to produce chilled water from waste heat in the warmer months.

This means the existing electrically powered chillers will run much



ENER-G's CHP system at Birmingham Heartlands Hospital

less frequently during the summer and that spare cooling capacity can be used to provide air conditioning to areas of the hospital which had not previously benefited from this.

Work has also been carried out to upgrade lighting with 1800 high efficiency, low energy fittings, which also further reduce emissions and energy costs.

ENER-G Plc is an international group that offers a proven range of clean and efficient energy solutions, in cogeneration, renewable energy, energy management and energy from waste. The UK company has helped organisations reduce carbon dioxide emissions by more than 20 million tonnes.

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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 reduces greenhouse gas emissions offsetting the impact of the proposed 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 to the public sector
- Possible grant funding

