Case study - Hospital

New CHP system will cut hospital's cost and carbon emissions

Sunderland Royal Hospital, UK

Sunderland Royal Hospital is a 970-bed acute hospital run by City Hospitals Sunderland NHS Foundation Trust and offers a full range of clinical specialisms and therapies.

The hospital is targeted to recover the £600,000 capital cost of its new ENER-G combined heat and power (CHP) system in less than three years. The Trust has also installed three high efficiency water boilers to replace the old steam boilers.

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. Energy is also lost along the many miles of electrical distribution cables needed to bring the power to site. Instead, the CHP system will generate electricity on site, as well as creating heat that will be used to provide heating, steam and hot water for the Royal Sunderland Hospital.

The new system replaces a gas turbine powered CHP unit, supplied by ENER·G 16 years ago. This latest project follows previous installations by ENER·G of CHP systems at major hospitals including Birmingham Heartlands, Solihull and the Royal Shrewsbury Hospital.

George Hood, the estates director for the Sunderland Royal hospital said:

"The trust welcomes the NHS target of reducing its carbon footprint 60% by 2050 and this latest CHP installation will give us a great start in achieving this target."

Inside an ENER-G 1.55MW CHP unit

CHP is a proven energy-efficient technology that can transform a business' performance in terms of energy cost and environmental emissions. This has seen a huge growth in popularity amid increasing economic pressure, regulatory concerns, and fears over security of supply.

As Europe's biggest employer, the NHS contributes approximately 3% of England's total carbon dioxide emissions, so there is a powerful need to implement effective carbon abatement strategies like CHP. A political mandate has now been set through proposals for a new Carbon Reduction Strategy that commits the service as a whole to reducing emissions by 60% by 2050. The potential for CHP use in the NHS is huge.

Sunderland Royal's top-end CHP system is among the first installations in Europe by ENER·G of its new 1.55MW MTU unit powered by a natural gas engine.

This comprises of a 16v gas connection generator set with LV generation that is transformed to 11kV in a transformer for the new MTU reciprocating unit develops 1550kWe, compared to the 1050kWe output of the hospital's previous gas turbine engine. The outgoing gas turbine power unit has enabled carbon savings of around 30,000 tonnes over 16-years.

The new CHP unit was purchased with an accompanying 15 year PremierPlus maintenance contract. This ensures all services and call outs on the unit will be carried out by a dedicated regional service engineer.

Savings

The installation has created £106,438 of financial savings to date and carbon savings of approximately 3447 tonnes per year, equivalent to the environmental benefit of planting 344,700 trees.

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

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 combined heat and power (CHP), renewable electricity generation from biogas, heat pump technologies, efficient lighting, controls, metering and data solutions and energy from waste.

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