

Case Study: Manchester Town Hall and Library



ENER-G CHP reduces carbon footprint of Manchester's historic town hall and library

Two of Manchester's finest public buildings are generating their own low carbon energy supply via ENER-G Combined Heat and Power (CHP) technology.

As part of the multi-million pound refurbishment of the grade two listed Manchester Town Hall Extension and Central Library, main contractor Laing O' Rourke worked with local CHP specialist ENER-G, NG Bailey and BDP to design, develop and supply the energy efficient system.

The ENER-G CHP technology is reducing the buildings' carbon dioxide emissions by 710 tonnes per year, which is equivalent to the environmental benefit of removing 237 cars from the road or the carbon offset in one year by 582 acres of forest. It has also helped the development to achieve a BREEAM excellent rating.

The two 230kWe ENER-G trigeneration engines produce the majority of heat, cooling and electricity required by the historic buildings, making a significant contribution to reducing energy consumption and utility bills.

By using two CHP engines, the Council is able to flex between the two units to maximise operating hours of the system overnight, when the electrical demand for the building is reduced.

The CHP system has been designed to operate in 'island mode'. In the event of an electrical network failure, it can be switched to operate independently from the main electrical grid - providing emergency power to maintain critical public services.

To operate in 'island mode' the system requires a heat rejection radiator, but with space constraints of retrofitting technology within a historic building, this wasn't possible. Instead, the heat rejection facility has been linked to the existing absorption chiller radiator, thereby making smart use of limited space.

A key principle set by the design team was that all waste heat would be utilised to maximise overall energy efficiency. To maximise output from the trigeneration system, thermal stores have been introduced into both the chilled and low temperature hot water systems to allow night-time charging.



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The benefits of cogeneration:

- Offers financial savings over conventional energy supply
- Primary energy savings deliver lower energy bills
- Higher efficiency offers reduced greenhouse gas emissions offsetting the carbon impact
- Greater security of supply and plentiful hot water
- Addition of chillers can provide efficient cooling
- Flexible procurement options
- Zero CAPEX required
- Potential Government funding for energy efficient schemes
- Possible grant funding

In addition, the cooling potential is being used to provide 24 hour chilling to the ICT communications rooms.

The Town Hall CHP project is the first phase of the proposed Greater Manchester Heat Network programme, which will provide a low carbon district heating supply for four city centre clusters, including Manchester, Bury, Oldham and Stockport.

Alan Barlow, Managing Director of ENER-G Combined Power Ltd, said: *“As a local business we are pleased to help Manchester City Council deliver on its carbon reduction programme. The units are operating at around 90% efficiency, helping to create cleaner and affordable energy for the city. This project demonstrates the suitability of CHP for retrofit projects.”*

Manchester’s Town Hall Extension and Central Library are buildings

of national significance, among the best examples of architecture of the 1930s and part of a civic complex of world class stature.

Combined Heat and Power - the simultaneous generation of electricity and useful heat - is around twice as efficient as conventional power generation, where the generated heat is wasted and further losses occur in transporting the electricity rather than using it on-site. CHP can achieve cost savings of up to 40% over electricity sourced from the grid and heat generated by on-site boilers.

ENER-G is Europe’s leading provider of packaged CHP systems with more than 2500 installations worldwide. Its technology is used by many Manchester organisations, including the Radisson Edwardian and Hilton Hotels and Manchester’s universities.

About ENER-G

Established in Salford, Greater Manchester in the 1980s, ENER-G delivers sustainable energy solutions and technologies on a business-to-business basis worldwide. ENER-G design, manufacture, operate, maintain and finance cogeneration systems from 10kW_e up to 10MW_e fuelled by natural gas, biogas or propane.

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