



Cogeneration powers major savings at sustainable new museum

Four cogeneration units have been installed to provide efficient generation at the largest newly-built national museum in the UK for more than a hundred years.

The prestigious \$112 million Museum of Liverpool has installed an advanced cogeneration system, guaranteeing annual energy savings of more than \$775,000.

The 'trigeneration' technology, which creates highly efficient heat, electricity and cooling, will also reduce carbon emissions by 870 tons each year – equivalent to the environmental benefit of taking 295 cars off the road.

ENER-G was commissioned by National Museums Liverpool (NML) to design and install the new cogeneration system at the Mann Island site – part of the famous Pier Head at the core of the World Heritage Site on Liverpool's famous waterfront. The installation was completed ahead of the museum's opening in July 2011. ENER-G will also operate and maintain the plant for 17 years.

The Combined Heat and Power (CHP) system is split between a plant room in the new building and the historic Great Western Railway (GWR) Goods Shed on Liverpool's picturesque waterfront. ENER-G has converted the Goods Shed into a state-of-the-art energy center with sophisticated remote monitoring and diagnostic facilities.

ENER-G has designed and manufactured two 385kWe bio-diesel CHP units, two 768kWe natural gas CHP systems and installed two 850kWe boilers, one 1000kWe absorption chiller and a 998kWe conventional compression chiller which will serve all the new museum's energy needs.

Challenges faced by ENER-G included preserving the GWR building exterior in line with planning conditions, as the site is part of a protected view and designing the energy center to operate independently of the utility electrical supply.



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 and hot water for the museum in the winter, and air conditioning and chilled water via the absorption cooling system in the summer months. The utility grid supply will provide additional back up, if required.

The GWR Building housing the CHP plant will also become an educational resource in its own right with a small visitor facility where groups can gain an understanding of the technology and its contribution to the museum's sustainability.

The complex energy facilities project, which was funded by the Co-operative Bank, was awarded the Combined Heat and Power Association's Innovation Award for 2009 is helping NML boost both its cost and carbon performance.

The museum has been designed to replace the former Museum of Liverpool Life. It provides 86,000 square feet of public space across three floors and demonstrates Liverpool's unique contribution to the world. It showcases popular culture while tackling social, historical and contemporary issues.

ENER-G delivers whole life cycle cogeneration projects - from initial design to long term care of the installation. Our solid financial status and independence provides the freedom to finance capital projects.

ENER-G's Quality Management System provides international best practice in design, manufacture and service. Customers are offered a flexible aftercare solution, including a variety of service packages to meet precise requirements. CHP on-board computer systems provide a two-way communication channel to the company's 24/7 remote monitoring center. This means that engineers can diagnose and resolve issues before they become problems and enables customers to minimize downtime and prolong system life.

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
- VAT savings
- Potential Government funding for energy efficient schemes
- 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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