

Queen's University Belfast saves £948,000 pa through CHP technology.



Leading power generation specialist, Edina Group, has installed energy efficient CHP (combined heat and power) across Queen's University Belfast as part of an initiative to reduce carbon emissions by 10,000 tonnes by 2020.

Key benefits

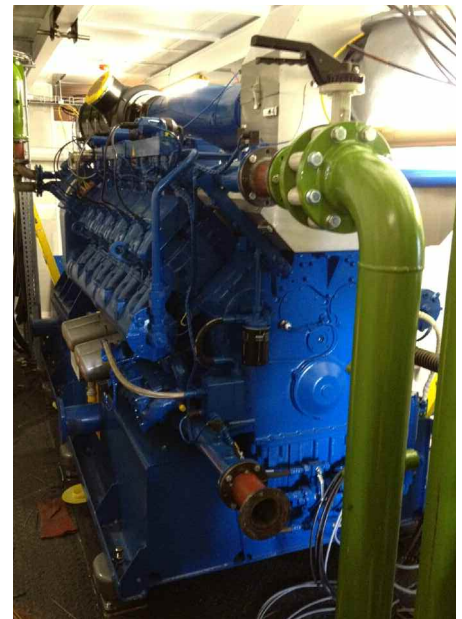
- CHP plants operate in excess of 86% efficiency
- Projected financial savings of £948,000 pa
- Reduced carbon emissions by 3,300 tonnes pa
- Surplus heat from the CHP is exported to the neighbouring Botanic Gardens, significantly reducing electricity charges for Belfast City Council

Home to more than 23,000 students and 3,700 staff, Queen's University Belfast is one of the UK's leading research intensive universities. The aim of installing CHP is to reduce energy costs and carbon output to help meet the targets contained in the University's Carbon Management Plan.

Following a competitive tender, the University appointed Edina Group to carry out the full turnkey contract to design, manufacture, supply, install, project manage and maintain two MWM natural gas engine CHP plants.

Scope of supply

The first CHP engine, the MWM TCG 2020 V12 with an electrical output of 1200kW, was installed at the University's Main Site, and the second 800kWe MWM TCG 2016 V16c CHP engine was installed at the DKB/Ashby Site.



The plant for the Main Site was containerised in an attenuated, acoustic enclosure at Edina's manufacturing facility, based in Lisburn, Northern Ireland and included full heat recovery from the engine jacket water, lube oil, intercooler and exhaust gases.



The Combined Heat and Power initiative is central to the University's Carbon Management Programme and will contribute substantially to reducing our emissions. We and neighbouring organisations stand to benefit both environmentally and financially from the scheme.

John Nugent, Head of Estates Development, Queen's University Belfast



This was installed to interface both electrically and thermally to the existing on-site infrastructure. Great attention to detail was paid to the design of the enclosure to ensure the installation had a low impact both acoustically and aesthetically.



Additional acoustic panels were fitted externally to attenuate the transfer of noise to neighbouring buildings and the CHP container was built, coloured and installed to blend in with its surroundings and to be as unobtrusive as possible.

Project challenges

The second CHP unit was installed within an existing plant room at the DKB/Ashby Site.

This project offered a number of challenges.

For example, the existing space could not accommodate a containerised engine and, in order to fit the engine and ancillaries inside the plant room, a new structural steel framed mezzanine

level had to be created and the CHP had to be built on-site in modular form.

A raised floor was constructed to house the engine, pump skids, ceiling mounted exhaust system, ventilation system and the control room.

A viewing gallery was also included to allow students to see the plant in operation to help raise awareness of the application of CHP and its long term environmental benefits.



To comply with noise restrictions, Edina fixed the engines on anti-vibration mounts consisting of elastic bearings, pressure plates and rubber limiters. Pump skids were also mounted on anti-vibration mats and the exhaust system was designed to dampen and prevent vibrations from travelling into the plant room structure.

Social and community benefits

During periods of low heat demand, the University are currently exploring the possibility of exporting surplus heat to the neighbouring Belfast Botanic Gardens which is owned and operated by Belfast City Council.

The heat could be stored in a large insulated hot water vessel and potentially used to heat the Palm House and greenhouses when needed.

Councillor Arder Carson, Lord Mayor of Belfast, said: "I am delighted that through this collaboration we are leading the way in terms of protecting the environment and promoting energy efficiency."

The reduction in energy costs to Belfast City Council for heating the Botanic Gardens glasshouses, ensures the continued viability of a free to access public attraction.



It is anticipated that Belfast City Council will achieve an annual carbon saving of approximately 200 tonnes as a result of this joint initiative.

Benefit of CHP

Recent performance figures from September 2016 show the CHP plants are achieving in excess of 86% efficiency and, in conjunction with improvements to boiler plant, are expected to generate annual financial savings of £948,000 and 3,300 tons of carbon emissions.

Professor James McElnay, Queen's University Pro-Vice-Chancellor, said; "Queen's is committed to making a positive impact on our community and around the world and this joint enterprise between Queen's University Belfast and Belfast City Council is testimony to that. We hope that through the new Combined Heat and Power Plant we will not only reduce our carbon footprint but also lead by example and inspire others to embrace eco-friendly initiatives."



The cost savings achieved by Queen's University Belfast ensures that funding may be directed to further beneficial schemes for the University and its population.

John Nugent, Head of Estates Development, Queen's University Belfast, said; "The Combined Heat and Power initiative is central to the University's Carbon Management Programme and will contribute substantially to reducing our emissions. We and neighbouring organisations stand to benefit both environmentally and financially from the scheme".



Following the successful installation and operation of the first two MWM engines, the University awarded Edina with a contract to deliver a further two engines, sized at 150kWe and 250kWe respectively, at the Centre for Experimental Medicine and the Elms Village student accommodation site.



About Edina

Edina is a leading supplier, installer and maintenance provider for energy efficient CHP (combined heat and power) solutions for natural gas and biogas applications, providing complete turnkey and containerised plant and control panel systems manufactured in-house.

Edina is the sole distributor in the UK and Ireland for leading efficiency MWM manufactured gas engines, world renowned for achieving maximum electrical and thermal efficiency, low operating and servicing costs and high reliability and availability.

With over 30 years' experience in providing flexible power generation solutions, Edina works closely with its customers to understand and meet their requirements, from initial contact to long term maintenance support.

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