



Case Study

Combined Heat & Power in a Nursing Home

St. Monica's Nursing Home opened in 1967. The home was refurbished in 1998 with help from the Sisters of Charity. Since then, St. Monica's can accommodate up to 46 residents and 12-15 clients per day in its Day Care Centre.



Refurbishment Project

St. Monica's Nursing Home was experiencing high energy bills due to old and inefficient boilers. The two 300kW bricklined Britannia boilers that had been converted to gas were close to 100 years old. The boilers were only operating at an efficiency of 50%, compared to current condensing boilers which operate at an efficiency of over 90%. The decision was made to install a CHP unit to improve efficiency and reduce costs.

Chp Reduces Energy Bills

Installing a CHP as part of the new heating system reduces energy usage, resulting in lower bills.

Once funding was secured for the upgrade, the older boilers were removed and four new commercial boilers, along with a SenerTec Dachs CHP unit, were installed. In addition to the installation of new equipment, the entire boiler room was rewired.

While the installation included a below ground level boiler house with difficult access, the new equipment was easily positioned and allowed de-commissioning of the old boilers with little disruption to heating throughout the building while work was carried out.

Results

Annual energy savings of more than €7,500 for St Monica's

The CHP plant provides up to 14.7 kW of thermal energy and 5.5 kW of electricity

CO₂ emissions reduction of 34 tonnes per annum

The installation operates up to 20 hours a day, 7 days a week.

“The project went exceptionally well. The downtime was hardly noticeable with little disruption while other work was carried out. The CHP is the heart of the system and provides a major contribution to our electricity usage. I would strongly recommend this installation to any nursing home thinking of upgrading - it's a no brainer.”

Declan Muholland,
Head of Maintenance



CHP System Integration

Installation

The plant consists of a SenerTec Dachs CHP and a 900 litre buffer tank with four Potterton Commercial Sirius Two WH110 boilers on a cascade frame as back up. The old calorifiers were replaced with two 500L quick recovery commercial Megaflo hot water cylinders from Heatrae Sadia. The CHP equipment was supplied by Glenergy while the natural gas boilers were supplied by Baxi Potterton Myson. The SenerTec Dachs CHP is designed for larger residential buildings or commercial premises. This natural gas fired CHP unit is designed for larger residential buildings or commercial premises. The installation operates up to 20 hours a day, 7 days a week, all year round.

Description of Plant Energy Facilities

The CHP unit generates electricity synchronised with the grid and is producing heat in parallel with the cascade of four boilers. The CHP is perfectly sized for the base thermal load of the nursing home. The system has been set up so the CHP is effectively the lead boiler thereby maximising its running hours and savings for the client. In the event of extra heat being required in times of peak demands the boilers automatically fire to boost the heat delivered to the nursing home.

The entire system is controlled and operated by the BMS that was custom built for the project.

Integration

This was a major project in a sensitive Nursing Home environment. St. Monica's has many elderly residents and it was important to ensure constant heating and hot water could be provided. The entire installation was delivered and project managed by Glenergy on a turnkey basis.



What is CHP?

CHP, also known as “Co-Generation”, is the simultaneous production of electricity and heat usually in the form of hot water or steam from a primary fuel such as natural gas. Electricity is generated on site using natural gas to drive an alternator connected to the turbine or gas engine. The waste heat generated by the turbine or engine is harvested to provide heating or hot water.

Why CHP?

Due to potential inefficiencies in electricity generation and the resulting cost of electricity from energy suppliers, significant savings can be made by generating electricity on site to meet the electrical demand. The financial benefits of onsite electricity generation (using natural gas to power the electricity generator) are evident by comparing daytime electricity prices in Ireland of circa 11.42 cent/kWh with market natural gas prices of circa 3.67 cent/ kWh (SEAI figures, October 2017 incl. VAT and relevant taxes). In addition, the efficiencies of the CHP system result in reduced energy usage and lower CO₂ emissions.



Benefits

Significant reduction in energy cost

CO₂ emissions reduced

Generation of valuable fuel resources

Lower carbon tax

Security and continuity of power supply

“Annual energy savings
of more than €7,500 for
St. Monica’s.”



CHP Developer

Glenergy

Glenergy’s aim is to provide the best energy solution for our clients at the best price whilst also taking into account our long term sustainability and greater social obligations.

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Boiler Supplier:

Baxi Potterton Myson

Baxi Potterton Myson sells and distributes heating and hot water products from Baxi, Potterton and Myson aswell as radiators, valves and controls, and Harman Stoves.

Baxi Potterton Myson

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This information is only a guideline to the different products available for use with natural gas in new development construction. Users should ensure that products are suitable for the specific circumstances in which they seek to apply them. Contact the supplier or manufacturer directly for specific information on building requirements and materials needed for installation. Professional advice specific to the project should always be sought. The current Irish Gas Standards and Technical Guidance Documents (Building Regulations) override all contents. Users should ensure they always have the most up to date information.