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Gas Networks Ireland

Case Study

Combined Heat & Power in the Medical Devices Sector

Bausch + Lomb is a global manufacturer of medical devices and pharmaceutical products.

Bausch + Lomb Waterford, located in the IDA Industrial Estate, Waterford, is a medical device manufacturer producing contact lenses for the global market.

The facility now produces over one million contact lenses per day and employs 1,250 people at its 44 acre site.

A state-of-the-art Combined Heat and Power (CHP) plant has recently been installed and commissioned at this facility.

Bausch + Lomb

Bausch + Lomb Waterford has implemented a number of successful energy reduction projects on-site. The most recent phase of the site's energy strategy was to install some form of onsite electricity generation technology.

A number of technologies were considered such as wind and solar, however CHP technology was chosen based on its higher availability and return of investment.

The project commenced in January 2014, with a comprehensive in-house study undertaken to map the energy profile of the site for one full year, ensuring that all of the operational and climatic conditions were taken into account.

Once a detailed load profile was completed, the size and type of CHP was determined based on the plant's electrical and thermal requirements.

A 3.3MWe gas reciprocating engine was selected, generating 3.3MW of electricity, 2.2 tonnes of steam and 1.5MW of low grade heat per hour, supplying 91% of the plants thermal demand and 72% of electrical demand.

BAUSCH + LOMB

Results

Annual saving in excess of €1million

Payback on investment in less than 4 years

The CHP engine will generate in excess of 27 million kWh of electricity per annum

The CHP plant provides

- 18.3 mega tonnes of steam
- 12,483MWh of low-grade hot water per annum

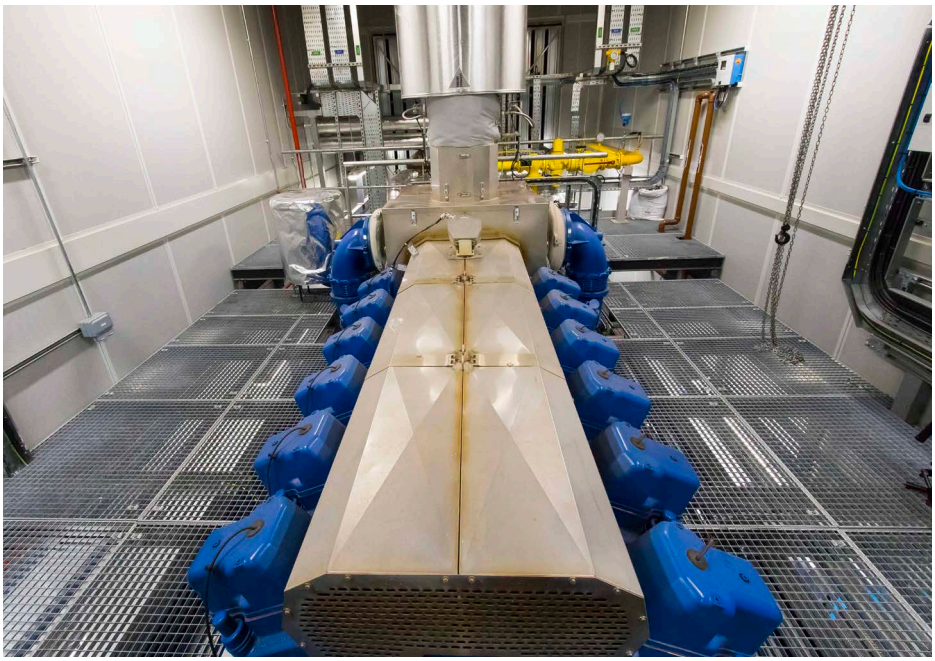
CO_2 emissions reduction of circa 7,000 tonnes per annum

Uptime of the CHP of over 96%

The CHP unit satisfies:

- 91% of the total thermal demand
- 72% of the total electrical demand

Bausch + Lomb CHP Controller



Facts

Engine weighs 45 tonnes

Engine output is 4,170hp

Engine speed is 1,000rpm

Engine life-cycle is 20 years

Alternator rating is 4,138kVA

Hot water flow rate is 65m³/hr

CHP System Integration

Installation:

The system is powered by a 45 tonne, 4,170hp V12 engine running at 1,000 revolutions per minute. The engine uses approximately 760m³ of natural gas per hour and consists of liquid cooled, twin turbocharged, heavy-duty four-stroke Otto gas-cycle technology. The engine is controlled centrally via a control system, to ensure optimal efficiencies and low consumption levels.

The installation operates 24 hour a day, 7 days a week generating electricity, steam and hot water all year round.

The custom built CHP building includes some innovative design solutions including; auxiliary equipment located on the roof of the building, additional pipe bridge for the medium voltage (MV) cables and gas pipe, LED lighting, maintenance platforms, additional acoustic properties including a cavity wall and finally, a dedicated viewing platform from which the engine can be viewed without entering the engine room.

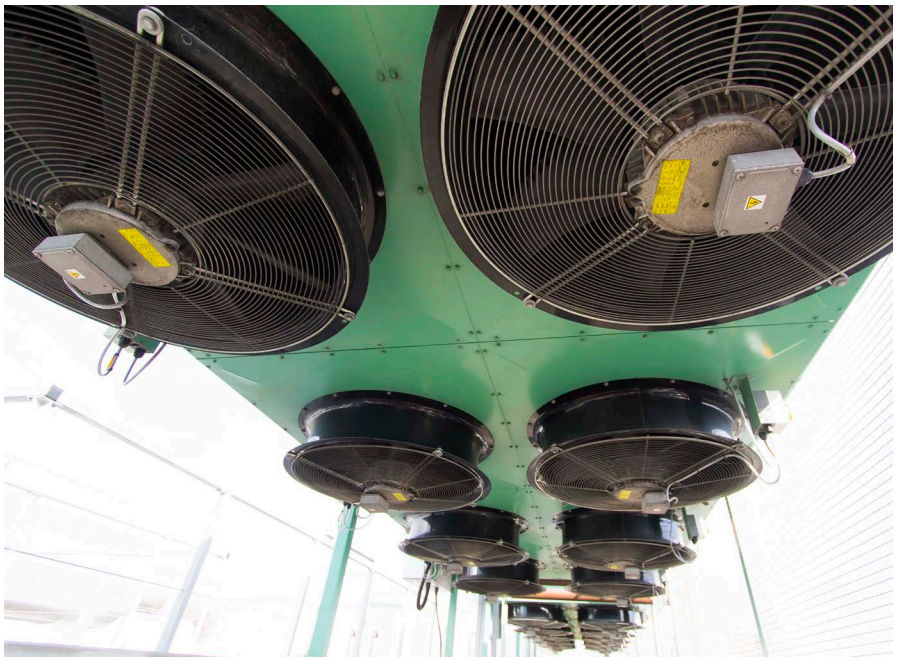
Control of Plant Energy Facilities:

The CHP system comes with two separate controller systems: the Inteli Modular Gen-set Controller used to control, monitor and protect the CHP and the Total Electronic Management (TEM) system providing full graphical operating software for manual control and visualisation of TEM control units specifically for gas engines. Both of these control systems offer the latest technology for controlling, monitoring, trending, remote interfacing, archiving, logging and user interface between the CHP and the end user.

The heat recovery system comes with its own Human Machine Interface (HMI) screen for controlling the boiler and is linked to the CHP controls systems.

Integration:

The natural gas connection was upgraded by Gas Networks Ireland to deliver the additional capacity required to supply this new CHP.



What is CHP?

Combined heat and power (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 by using natural gas to drive an alternator connected to the engine. The heat from the exhaust fumes generated by the engine is harvested to provide heating and hot water for the building, while some of the energy within the hot water can also be used to provide cooling and air conditioning by using absorption chillers.

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 commercial electricity prices in Ireland of circa 11.26 cent/kWh with commercial market natural gas prices of circa 3.61cent/kWh (SEAI figures, July incl. VAT and relevant taxes). In addition, the efficiencies of the CHP system result in reduced energy usage and lower CO_2 emissions.

Benefits

- Significant reduction in energy costs
- CO_2 emissions reduced
- Conservation of valuable fuel resources
- Lower carbon tax
- Security and continuity of power supply

Gas Networks Ireland

"Bausch + Lomb are extremely satisfied with the performance of the CHP unit to date and have exceeded the initial project payback and uptime periods. This has resulted in greater than expected financial and environmental savings for the site."

Derek O'Connor,
Facilities Engineering & Structural Manager

Technical Team

CHP Developer:

Edina Ltd.

Specialists in Power Generation
Edina

Business Description

Edina is a leading supplier, installer and maintenance provider for gas to power solutions, and is the sole distributor in Ireland and the UK for market leading MWM manufactured gas engines.

MWM gas engines are world renowned for achieving market leading electrical and thermal efficiency, low operating and servicing costs and high reliability and availability.

With over 200 staff located across Ireland, the UK and Australia, Edina's dedicated teams provide detailed design, project management, installation, commissioning and maintenance, all from a single source.

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Bausch + Lomb

Business Description

Bausch + Lomb, a Valeant Pharmaceuticals International, Inc. company, is a leading global eye health organization that is solely focused on protecting, enhancing and restoring people's eyesight. Our core businesses include over-the-counter supplements, eye care products, ophthalmic pharmaceuticals, contact lenses, lens care products, ophthalmic surgical devices and instruments. We develop, manufacture and market one of the most comprehensive product portfolios in our industry, which is available in more than 100 countries.

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