Combined heat and power solutions

Medical Device Company, Ireland

Cogeneration system helps medical device company achieve goals to reduce energy costs and greenhouse gas emissions.

The Opportunity

As part of an Energy Rationalisation Project our client required two combined chilling and power (CCP) units to provide power and energy through the simultaneous generation of usable thermal energy and electricity from a single natural gas source. In the case of this project, the heat energy is used to produce chilled water using an absorption chilling plant.

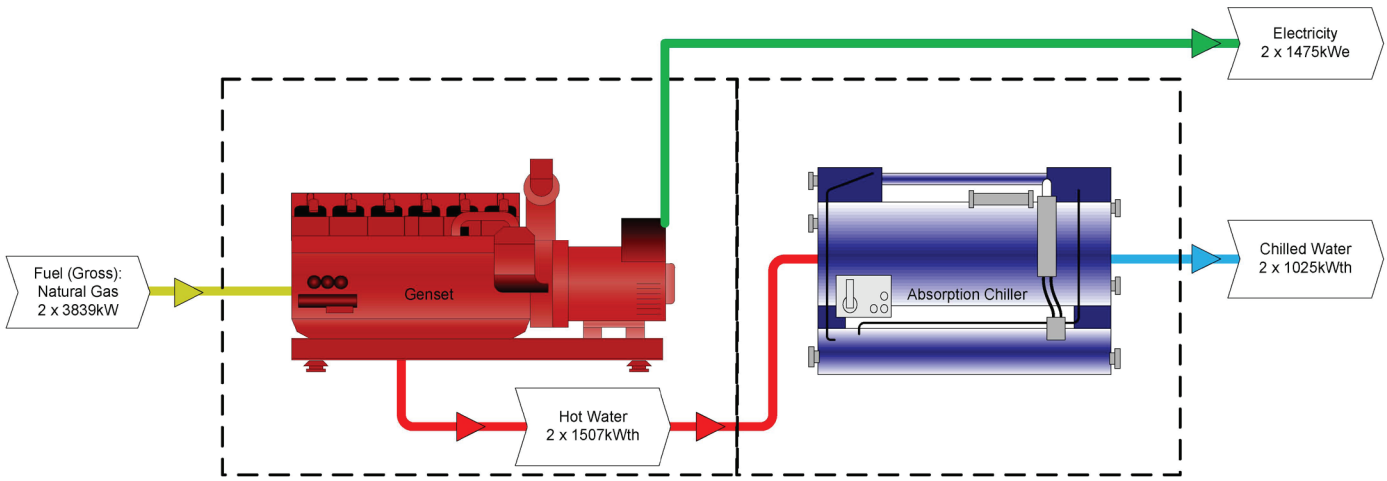
The Solution

Working closely with the client's consultants, Dresser-Rand designed, manufactured and installed two natural gas-fuelled CCP systems, each rated at 1.475 MWe. They generate power at 10.4 kV, three-phase, 50 Hz for direct use at the facility. Heat is recovered from the engines' cooling and exhaust systems in the form of hot water, which is fed directly to close-coupled, single-effect, lithium bromide absorption chillers. Each chiller produces 1.025 MW of chilled water to serve cooling loads associated with the client's processes.

Scheme technical data	
System	2 x 1,475 kWe units
Fuel input	7,678 kW (26.216 MMBTU/hr)
Power output	2,950 kWe
Chilled water	2,050 kWth (583 USRT)
System efficiency	85%
Project payback	5 years
System CO_2 saving	6,300 tonnes/year (20% CO_2 reduction)

The cogeneration system is designed to achieve a guaranteed operational availability of 92 percent at full load and deliver an annual electrical output of 24.2 GWhrs with an annual cooling output of 16.8 GWhrs. Anticipated CO_2 savings, compared to conventional forms of supply, are 6,300 tonnes per annum.

The CHP process displaces a large percentage of the electricity previously supplied by the grid. Currently, the facility is operating at an overall thermal efficiency of 85 percent on a nett fuel input basis. This compares favourably to importing grid power that can be generated at as low as 35 percent efficiency at the generation point, with an additional efficiency loss of seven to nine percent in the transmission and distribution system (and producing chill from conventional vapour compression chilling plant).



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The chillers have been assembled with all necessary pumps, heat exchangers and controls into engineered packages of the same construction as the matched gas engine-driven generator sets and heat recovery units. Cooling of the absorption chiller packages and engine systems is carried out by a separate cooling tower system controlled by the integrated overall scheme control system.

Main Barriers

The main barriers encountered were the strict noise, environmental emissions, process waste and effluent discharge requirements imposed by the site. Special consideration was given to the cooling towers, engine selection and water treatment process to accommodate these strict requirements.

The Company

Dresser-Rand provides a complete range of fully packaged and tested combined heat and power (CHP) systems to commercial, industrial and municipal energy users worldwide. CHP (or cogeneration) systems reduce on-site energy costs and carbon dioxide emissions through the highly efficient delivery of power and heating. Combined cooling, heat and power (CCHP or trigeneration) systems, provide the high efficiency of CHP, with the added benefit of chilled water output.

For more information about Dresser-Rand **CHP solutions**, contact one of the following locations or visit **www.dresser-rand.com/products/CHP**:

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