ENGIE Group, Italy
Full Load (IPP)

Heating power for Italian Aosta Mountain Region

Last year, the energy company ENGIE Italia built a new cogeneration plant with the aim of supplying heating power to residential accommodations and public buildings in Aosta city in northern Italy within the next two years. The project involves building 47 kilometres of distribution network and then generating up to 154,000 MWh per year of thermal power. The major innovative feature of the power plant is a large-scale heat pump capable of 17 MW of thermal capacity, ie 6.3 MW electric power. The heat pump is used to recoup what would otherwise be waste thermal energy from the process of cooling water (approx. 20 degrees Celsius) of a major local steelworks and thereby heating up the water in the distribution network to around 90 degrees Celsius. To power the pump, Rolls-Royce supplied a B35:40V16 gas engine scheduled to operate for more than 5,000 hours a year generating electrical and thermal energy. The unit achieves an electrical efficiency rate of more than 47.6 percent and thermal efficiency exceeding 46 percent. The engine thermal energy is recouped from exhaust gases, engine cooling water, high-temperature circuit of the charge-air cooler and some of the lube oil and is used to warm district heating water directly to levels of up to 90 degrees Celsius. The remaining engine thermal energy from the lube oil and from the low-temperature circuit of the charge-air cooler is returned to a water circuit for the heat pump. “We opted for Rolls-Royce because the unparalleled electrical efficiency of the engine clearly verifies the possible cost savings,” said Jean-Francois Chartrain, head of Technical support and engineering at ENGIE Italia. Large-scale hot water tanks and additional gas heating boilers allow ENGIE Italia to react more effectively to fluctuations in the demand for heat.

In Italy, heat recovery utilizing reciprocating engines and heat pumps and involving sources such as waste heat from industrial processes, groundwater or the low-temperature cooling circuits of engines is today regarded as proven technology. More than ten Rolls-Royce engines are already in operation in district heating power plants using heat pumps. In many cases, the entire electrical power available from the engines is fed to the heat pumps. ENGIE Italia has been operating a district heating power plant with two Rolls-Royce-units (each outputting 3.6 MWe) in the same region since 2003. Today, there are more than 130 Rolls-Royce engines in Italy delivering a total of over 400 MW of installed power. 30 of them operate in district heating power plants.

Bergen Engines is a subsidiary of Rolls-Royce Power Systems, supplying medium-speed gas and liquid fuel engines for a broad range of power generation applications. Bergen Engines supports your business with reliable power solutions from 1,400 kW to 9,600 kW per engine, and complete power systems that can deliver an output of beyond 200 MWe.