

**SUCCESS STORY WASTEWATER
TREATMENT PLANT BRONZOLO (IT)**

65% reduction in consumption with Belimo Energy Valves

65% reduction in the purchase of methane gas

In an abstract situation, a sewage treatment plant should only be supplied with energy obtained through the self-generation of biogas. In rare cases only should one resort to the purchase of methane gas from the network to compensate for any shortcomings. These can originate from various factors, such as a malfunction in the biogas production line, a defect in the heat cogenerators, or insufficient biogas production during the off-season and/or an insufficient and variable addition of industrial/food slurry.

Prior to the optimisation, the Bronzolo wastewater treatment plant required an average of approx. 260,000 Nmc/year of methane gas. Now, thanks to the Belimo Energy Valves and the plant optimisation, the purchase of methane gas has been reduced to approx. 90,000 Nmc/year, with a saving of the 65%.

TYPE OF BUILDING

Civil and industrial wastewater treatment plant

PROJECT

RetroFIT+

SECTOR

Optimisation of the thermal plant

PRODUCTS

Belimo Energy Valves

BELIMO[®]

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Avoid unnecessary temperature rises

The civil waste water that flows to the treatment plant is purified and the sludge extracted from this water is sent to the digester. In the digester, this sludge from the purification process is then transformed into biogas (consisting of methane gas, carbon dioxide and biomass). The methane gas produced is stored in the gasometer and after necessary treatment converted into electrical and thermal energy through heat cogenerators (endothermic gas engines, Otto cycle).

The electrical energy produced is consumed within the purification plant, while the thermal energy, in the form of an AC 80°C heating circuit, is consumed for the following various circuits:

- Sludge heating for the two digesters
- Fan coils for heating of the office building
- Radiators for heating various secondary rooms
- Unit heaters for heating the workshop and the warehouse
- Heating for three ventilation systems

Before the optimisation, the plant was consisting of circuits:

- Three heat cogenerators for the civil waste water plant running on self-generated biogas and network methane gas complete with two thermal accumulators of 7 m³ each
- Two heat cogenerators for the industrial waste water plant, running self-generated biogas and network methane gas, complete with 10 m³ thermal accumulator and connected to the former with a single network
- Three emergency boilers (backup) equipped with network methane gas burners
- A heating distribution manifold

The connection of the two cogeneration plants via a single network was realised with classic 3-way valves for switching and diverting the fluids, as well as two hydronic separators.

In addition, the existing system consisted of circuits controlled by constant flow pumps with hydronic bypasses (two hydronic separators, several bypasses between supply and return, 3-way valves for switching and diverting of fluids, and unregulated constant flow primary circuits).



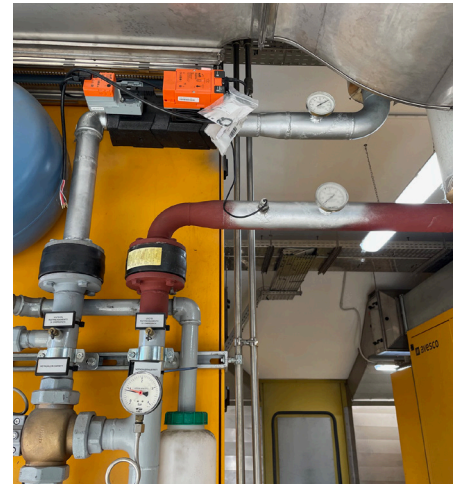
"The optimisation of the entire heating circuit paid particular attention to the elimination of any bypass and short circuits between the supply and the return, to avoid unnecessary temperature rises on the return of the heating system, i.e. to prevent the return from having a fever!"

Eng. Walter Prighel
Thermostudio Brunico – Meran – Italy

The optimisation intervention

During the optimisation phase of the heating system, the following improvements were carried out:

- a) Replacement of the "classic" 3-way valves (mixing and diverting types) with 25 new electronic 2-way Belimo Energy Valves.
- b) Replacement of heat pumps with new electronic types, with EC technology and built-in frequency variators.
- c) Installation of a primary, twin electronic pump functioning as "master" and operating as a pump optimiser, as it is included in the communication bus of the 20 heating zones with the Belimo Energy Valves.
- d) Optimisation of the entire heating hydronic circuit, with particular attention to the elimination of any bypass and short circuit between supply and return. All this to avoid unnecessary temperature rises on the return circuits of the heating system.

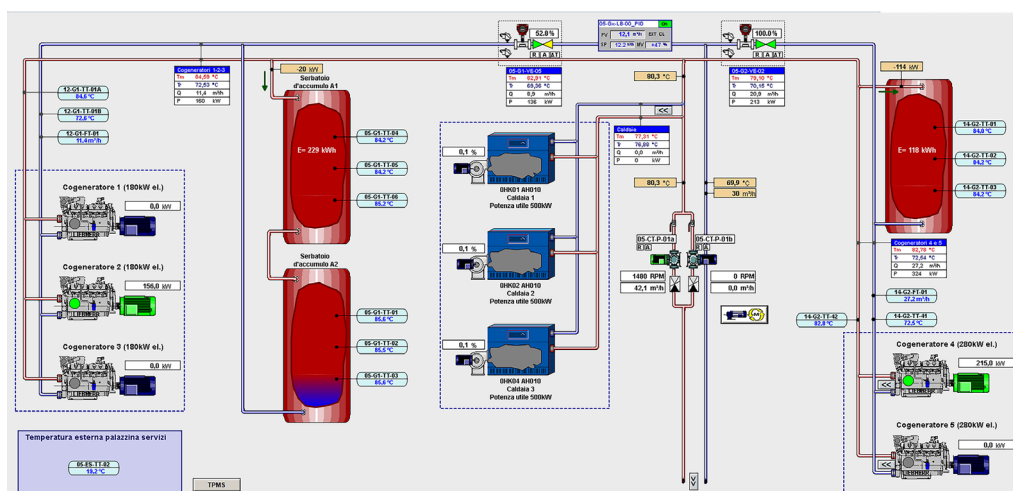


BRONZOLO WASTEWATER TREATMENT PLANT

- Capacity: 342,000 population equivalent
- Treated water: civil and industrial waste water
- Catchment area: Bolzano (S. Giacomo district), Bronzolo, Laives, Nova Ponente, and Vadena municipalities
- Entrance into service: 1996
- References: www.eco-center.it

A 65% saving in gas purchase

After the start-up of the refurbished plant, impressive results were immediately achieved in terms of energy savings and heat balance. Prior to the optimisation of the plant, an average of approximately 260,000 Nmc/year of methane gas was purchased and consumed in addition to the self-produced biogas. After the optimisation and monitoring of the plant, with the aid of the Belimo Energy Valves, the purchase of methane gas dropped to around 90,000 Nmc/year. Therefore, the result is 170,000 Nmc/year less methane gas purchased, representing a saving of the 65%.



All inclusive

Belimo is the global market leader in the development, production, and sales of field devices for the energy-efficient control of heating, ventilation and air conditioning systems. The focus of our core business is on damper actuators, control valves, and sensors and meters.

Always focusing on customer value, we deliver more than only products. We offer you the complete product range for the regulation and control of HVAC systems from a single source. At the same time, we rely on tested Swiss quality with a five-year warranty. Our worldwide representatives in over 80 countries guarantee short delivery times and comprehensive support throughout the entire product life. Belimo does indeed include everything.

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Short delivery times



Comprehensive support

BELIMO Italia

Via Zanica 19H, 24050 Grassobbio (BG) – Italy
+39 035 5788700, info@belimo.it, www.belimo.com

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