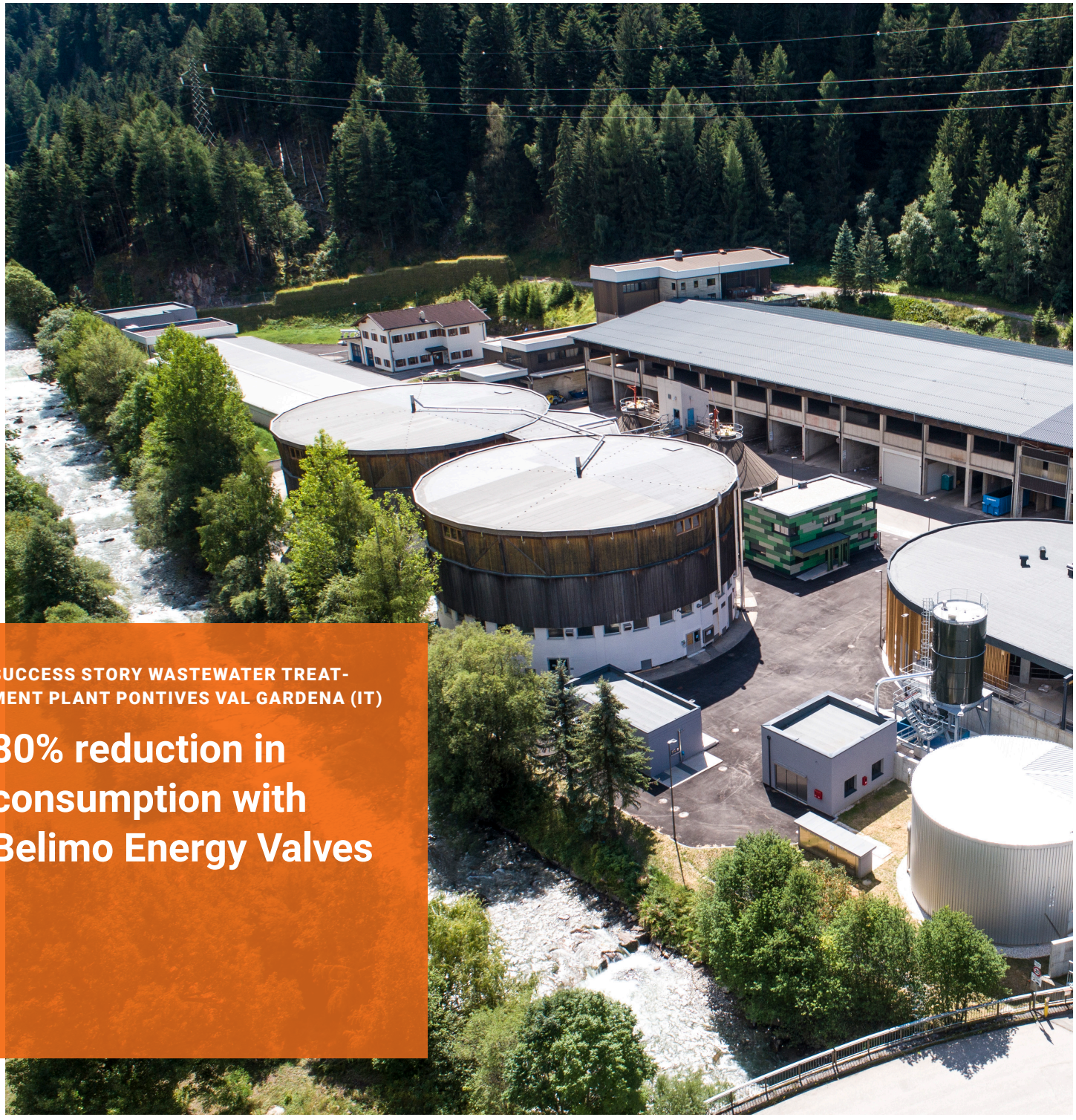

SUCCESS STORY WASTEWATER TREATMENT PLANT PONTIVES VAL GARDENA (IT)

80% reduction in consumption with Belimo Energy Valves

An outstanding energy-saving result

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 in tourist locations. Before the optimisation, the purification plant located in Pontives, Val Gardena, required an average of approx. 125,000 Nmc of methane gas per year. Thanks to the Belimo Energy Valve™ and the effective optimisation of the plant, the annual purchase of methane gas has fallen to around 25,000 Nmc, with a saving of the 80%.

TYPE OF BUILDING
Civil wastewater treatment plant

PROJECT
RetroFIT+

SECTOR
Optimisation of the thermal plant

PRODUCTS
Belimo Energy Valves

BELIMO®

Various functions via the Modbus line

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
- Office building rooms heating
- Hot water production for consumption
- Radiators and unit heaters for heating various storehouse rooms
- Ventilation system heating for the storehouse

The ventilation system for the pre-treatment is realised without heat recovery as provided for in the Italian law 10-1991 and DPR 412/1993.

Before the optimisation, the plant was consisting of:

- Two heat cogenerators running on biogas.
- Two emergency boilers (backup) equipped with combined biogas and natural gas burners.
- One heating distribution manifold

The circuits of the existing plant were also composed of circuits controlled by constant flow pumps, using circuits with hydraulic bypasses (hydraulic separators and several bypasses between supply and return, and unregulated constant flow primary circuits all without thermal storage).

The purpose of using Belimo Energy Valves was to install electronic valves capable of performing the following functions via the Modbus line:

- Modulation of the control loop required by the heating capacity
- Measurement and control of the flow rate in mc/h
- Measurement and control of the differential temperature between supply and return in °C
- Measurement of the thermal output kW
- Monitoring of the consumed power in kWh

"The main objective of the Belimo Energy Valve™ installation was to integrate electronic valves capable of performing various advanced functions via the Modbus line, such as modulation and monitoring of the thermal output required for regulation, measurement and controlling of the flow rate as well as of the differential temperature between flow and return, and the general monitoring of the energy consumed."

Engineer, Walter Prighel
Thermostudio Brunico — Meran — Italy

The optimisation intervention

In the optimisation phase of the heating system, the following improvements were performed:

a) Replacement of the classic 3-way valves (mixing and diverting types) with new electronic 2-way and 3-way Belimo Energy Valves.

b) Replacement of the heat pumps with new electronic types, with EC technology and built-in frequency variators.

c) Optimisation of the entire heating circuit, with particular attention to the elimination of any bypass between supply and return. All this to avoid unnecessary temperature rises on the return circuits of the heating system

d) Installation of a thermal accumulator with a volume of 5 m³.

e) Replacement of the two existing boilers with latest-generation high-efficiency boilers

An outstanding energy-saving result

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 about 125,000 Nmc per year of methane gas were bought and consumed in addition to the self-produced biogas
- After the optimisation and monitoring of the plant, with the help of the Belimo Energy Valves, the purchase of methane gas has fallen to approx. 25,000 Nmc per year This results in a reduction of approx. 100,000 Nmc of methane gas, that is in other words a saving of the 80%

PONTIVES CIVIL WASTEWATER TREATMENT PLANT

Capacity: 75,000 population equivalent
Treated water: civil waste water
Catchment area: 5 municipalities
Entrance into service: 1992 (extension in 2018)
References: www.eco-center.it

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.

The "small" Belimo devices have a big impact on comfort, energy efficiency, safety, installation, and maintenance.

In short: Small devices, big impact.

- 5-year warranty
- On site around the globe
- Complete product range
- Tested quality
- Short delivery times
- Comprehensive support

EN – 03.2025 – Subject to technical modifications

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