

A digital twin to support Bresso-Niguarda WWTP operations

Combining automated data processing, process modelling and real-time control to optimise WWTP efficiency



Fast integration of online data and process models



Identification of optimal operational strategies in a virtual environment



User-friendly and customisable dashboard to support operational decisions

Challenge

Gruppo CAP has set ambitious goals for its WWTPs, where high effluent quality is to be coupled with energy efficiency, recovery and reuse of valuable resources. Achieving these goals requires solutions that support daily and long-term plant operation, made possible with recent advances in digitalisation. The use of online sensors can assess WWTPs in real-time, but it may also result in large and possibly unverified data streams that affect prompt and effective decision-making. Furthermore, operators need reliable tools that enable them to virtually evaluate the impact of operational choices (modification of control settings, future revamping) and identify strategies that will improve plant efficiency.

Solution

DHI and Gruppo CAP cooperated to implement TwinPlant – a digital twin – for Bresso-Niguarda WWTP. The digital twin is a virtual replica of the plant and provides operational decision support by integrating online sensors and process models. The solution combines:

- A MIKE OPERATIONS platform to collect, store and validate online sensor data from the SCADA system
- A plant-wide WEST model, which includes a realistic description of the treatment processes and control strategies, along with an energy balance estimation
- A graphical dashboard to access online measurements and simulation results, as well as compare operational strategies through customised key performance indicators

The digital twin acquires online data from SCADA and predicts plant performance in real-time and 24 hours in the future. The solution allows operators to identify optimal operational settings in key sections of the plant in response to changing conditions and/or to ensure increased plant efficiency.



'DHI was professional and smart in implementing Gruppo CAP's first WWTP digital twin, coupling process modelling to real-time SCADA data. We now have a powerful tool for monitoring the actual status of the system and planning operating scenarios plant-wide in a user-friendly interface.'

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