Case Story – Highlights

Optimising the wastewater treatment plant of Ravenna, Italy

Providing dynamic WWTP modelling and simulation to improve operational efficiency

Reliable description of WWTP operation and performance

Assessment of scenarios leading to optimised efficiency and costs

Support to decision making and implementation of optimal strategies

Challenge

The wastewater treatment plant (WWTP) of Ravenna, Italy has been considered for an upgrade to improve sludge handling capacity, energy recovery and accommodate the population growth in the catchment.

Various factors – including low influent organic loading and reduced capacity of sludge treatment – have affected the performance of the Ravenna WWTP. This has resulted in limited energy recovery and high energy consumption due to aeration requirements.

Solution

Our client HERA S.p.A. approached us to develop a model of the WWTP. We devised a solution to provide the basis for the evaluation of several operation scenarios using WEST, DHI's modelling software for the dynamic modelling and simulation of WWTPs and other types of water quality related systems. The WEST model proved to be a reliable decision-support tool for the utility to identify the most suitable optimisation and upgrade strategies.

Solution highlights

- Model development, calibration and validation
- Scenario analysis with validated WEST model to evaluate multiple operational strategies aimed at improving treatment, energy and cost efficiency of Ravenna WWTP

GRUPPO HERA

'We chose WEST for its great capabilities in describing biological processes in wastewater treatment systems and its high potential for customisation through the creation of new process models and process units that are not present in the standard library. Furthermore, the intuitive graphical user interface and the ease of importing our own data allowed us to rapidly build complex plant layouts, such as the one of Ravenna WWTP (240,000 PE).'

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