

Optimising Serbia's water supply network in the changing energy market

Using hydraulic modelling to help Novi Sad Water and Sewerage Utility achieve energy savings and reduce carbon footprint



Complex part of the water system now well represented in hydraulic model



Hydraulic model linked to energy forecast model for more accurate pricing estimates



Energy savings measures discovered through comparison of energy optimisation scenarios

Challenge

The Novi Sad Water and Sewerage Utility Company (ViKNS) needed to improve its water supply system in light of the country's changing energy market. Together with the Regional Centre for Energy Policy Research (REKK), DHI's engineers used hydraulic modelling to identify energy saving interventions, forecast energy use and provide a cost-benefit analysis to determine the best operational scenarios. The partnership provided a much-needed solution for the water utility, which has not yet developed a hydraulic model for Srem area—the most complex part of the water system—to this day.

The majority of the water supply in the area is based on pumping water. With about 45 pumps in the vicinity, the water utility was dealing with significant energy requirements and associated costs. A calibrated hydraulic model would best help them determine ways to lower the pumps' energy use. The intention was also to use the model results to calculate how to reduce CO₂ emissions.

Solution

DHI developed a hydraulic sub-model of the Novi Sad water network consisting of 210 km of pipelines of diameter 100-900 mm (excluding service pipes), primarily made of AC, PE, PVC, and CI/CLS. The Srem area water network consists of over 15 pressure zones, a high number of pumping stations (about 45 pumps) and 14 storage tanks. DHI's solutions were to:

- Create a calibrated hydraulic model of the water system
- Link the hydraulic and energy market forecast models
- Provide cost-benefit analysis and suggestions for better operations
- Analyse potential CO₂ savings to support climate change mitigation

Electricity price forecast and cost calculations

Using the European Power Market Model that provides wholesale electricity prices for each hour and each country, DHI's partner REKK helped ViKNS calculate average energy prices to estimate retail price points.

'We are happy to cooperate with DHI. The hydraulic model they developed for the complex Srem area will help us improve and optimise the water system. Thanks to the DHI team, our work is now easier thanks to the energy-efficient and sustainable solutions proposed.'

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