

Case Study

Data-Driven Optimization
of Wastewater Treatment

Innovative Technology Optimizes Wastewater Treatment

Guard Automation, a Norwegian company specializing in industrial automation and data analytics, has developed a solution that reduces chemical use and improves wastewater treatment at Norwegian plants. In February 2023, the solution was first implemented at the Elvika treatment plant in Modum municipality.

Roger Engen, Head of Water and Wastewater at Modum Municipality, explains that the plant processes thousands of liters of sewage per hour. The goal is to remove environmentally harmful substances and release clean water back into nature. To achieve this, large amounts of chemicals are typically used to bind harmful substances like phosphorus.



Roger Engen, Head of Water and Wastewater at Modum Municipality

"Determining the right chemical dosage has been a longstanding challenge. Now, we are ready to roll out this solution to municipalities across Norway," says Jon Egil Ek from Guard Automation. The company assists nearly 40% of Norwegian municipalities with critical infrastructure systems.

Cleaner Water with Fewer Chemicals

Ek highlights that factors like snowmelt, time of day, and precipitation affect the amount of chemicals required, referred to as "foreign water" in technical terms. "Our solution, Guard Treat Smart, is a predictive model that optimizes chemical dosing based on foreign water levels. When foreign water increases due to snowmelt or rainfall, less chemicals are needed," he explains.

Preliminary results from the Elvika pilot show cleaner water with reduced chemical use. "We've seen a 20% reduction in chemical consumption, and we expect further improvements as the model continues to learn," Ek adds.

Engen confirms: "The solution provides cleaner water with fewer chemicals, saves money, and makes plant operation easier." Previously, chemical dosing was manual and based on educated guesses. "Now, the technology automates this process, and the plant isn't staffed on weekends," Engen notes, adding that the municipality spends hundreds of thousands of kroner annually on chemicals.

More Informed Decisions

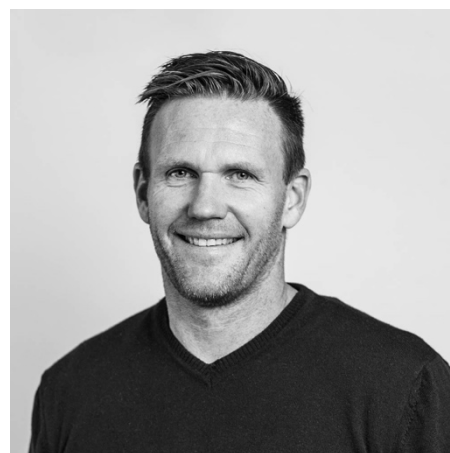
In addition to optimizing chemical use, Guard Treat Smart offers valuable insights into wastewater composition, pH levels, and retention time. Continuous measurements can help analyze pipeline conditions, evaluate improvement measures, and support decisions on capacity upgrades.

Comprehensive Development and Virtual Testing

Guard Automation began developing the solution in October 2021. The company used data from various treatment plants across Norway to conduct advanced analyses of process variables and external factors such as meteorological and demographic data. This led to the development of a cloud-based adaptive model for operational optimization.

"Virtual tests were essential for validation. We ran the model in shadow mode at ten plants, which taught us a lot and showed we can significantly reduce chemical use," says Ek.

He believes the technology will revolutionize wastewater treatment in Norway. "This solution simplifies operations, cuts costs, reduces environmental impact, and improves purification efficiency. It's a game-changer for treatment plants in Norway," concludes Ek.



Jon Egil Ek, Head of Industrial IoT & AI at Guard Automation