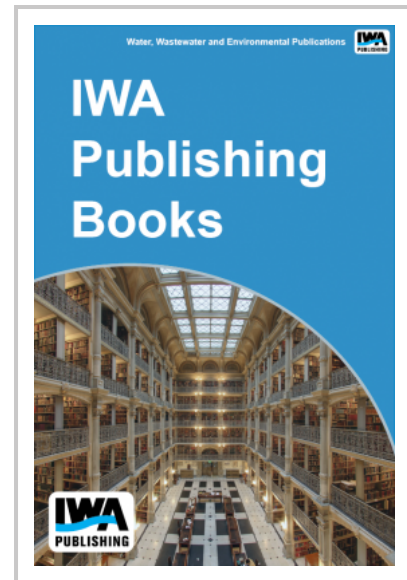


Best Practices for Sustainable Wastewater Treatment: Initial Case Study Incorporating European Experience and Evaluation Tool Concept

The primary goal of the Optimization Challenge is to develop an approach that will allow the wastewater sector to achieve treatment goals while reducing the resources expended by 20% or more. The greater energy and chemical demands of facilities that provide nutrient removal make them a particularly challenging target, yet one with a significant potential return. This report has three objectives:

- To evaluate the European Experience with energy reduction and best practices at wastewater treatment plants (WWTPs).
- To evaluate the best practices employed at a European WWTP exhibiting significant energy reductions and energy management.
- To develop a viable template for a mass and energy balance model to be used as the basis for a subscriber-accessible tool that will be developed later.



The project team considered European facilities that have a history of process optimization and could serve as examples of best practices for the industry. One of these is the Strass im Zillertal WWTP near Innsbruck, Austria, a municipal facility that provides for both nitrogen and phosphorus removal. A lengthy optimization process spanning more than a decade has enabled the Strass plant to attain the singular goal of producing more electricity on an annual basis than it consumes.

Factors specific to the plant contributed to the Strass WWTP's transformation into a net electricity producer, including the facility's need for only low level (5 meter static head) influent pumping. However, the bulk of the energy and process optimization resulted from a combination of national programs, concerted efforts by a highly-educated operations team, and an energy-conscious mindset. WERF and its subscribers can readily apply these success factors to North American facilities.

This study examined the context, drivers, and decisions behind the Strass WWTP enhancements toward energy self-sufficiency. These included:

- Examining regional and national energy and resource conservation programs that target wastewater treatment facilities in Scandinavia, Holland, Germany, Switzerland, and Austria.
- Assessing Energy Conservation manuals used to promote resource conservation in European WWTPs.
- Defining metrics applicable to WWTP operations optimization.
- Evaluating Strass WWTP performance, including interviews with the plant operations staff.

Formalizing and extending the approaches used by the Strass team to quantify and evaluate the sustainability of treatment plant operations, and developing an approach to adapt them to the North American reality.

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