

# **Benchmarking energy efficiency in drinking water treatment plants: Quantification of potential savings**

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## **Abstract**

Within the urban water cycle, energy issues have been mostly studied for wastewater treatment plants, ignoring that drinking water treatment plants (DWTPs) also consume a significant quantity of energy. Knowing the real energy consumption of DWTPs is the starting point for any energy-saving initiative. This paper benchmarks the energy efficiency measures of a sample of real DWTPs using the data envelopment analysis methodology. Subsequently, whether these facilities are affected by economies of scale is investigated. This issue is essential for planning new DWTPs that minimize energy consumption. In the second stage of analysis, some structural and managerial variables affecting energy efficiency are explored. The results showed that most of the DWTPs analysed have a suitable size but can greatly improve in terms of saving energy. It was found that the age of the plants and the water company operating them significantly affects its energy efficiency. The approach applied in this paper is of great interest for water regulators and company managers since it enables them to learn from the best practices for reducing energy consumption in DWTPs and contributes to improving the sustainability and efficiency of the urban water cycle.

## **Keywords**

Energy efficiency, Drinking water treatment, Data envelopment analysis, Optimal size, Energy saving