How to assess the effectiveness of energy management processes in water supply systems

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ABSTRACT

The main objectives that generally motivate the implementation of energy management strategies, suggestions of possible assessment criteria and corresponding performance measures are presented in a systematic way. A methodology based on the hydraulic energy balance along water pipe systems and four performance indices to assess energy efficiency is established. This methodology is applied to a real-life water supply system for two consumption scenarios and two operating schemes. The calculation of index E4 and the comparison between scenarios and schemes rely on the hydraulic simulation of the system. The application of this methodology has demonstrated the robustness and practicality of the proposed new performance indices, being particularly relevant for the comparison of different measures for the improvement of energy efficiency, such as the use of variable speed pumps and the installation of micro-turbines. More applications are needed for systems with different sizes, layouts and elevations in order to identify and to overcome practical application difficulties.

Key words | energy efficiency, energy management, performance indicators, water supply

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