

Analysis of energy usage at membrane water treatment plants

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ABSTRACT

The production and supply of potable water using seawater and brackish water desalination, and reclamation of wastewater for reuse by membrane processes has seen a rapid growth in the last decade to meet the growing demands of water in many regions of the world. Energy consumption plays a critical role in the selection of appropriate membrane treatment technologies for potable water production. For example, wastewater reclamation for reuse by membrane filtration is more attractive than reverse osmosis (RO) desalination due to much lower specific energy consumption and materials costs. Specific energy consumption reflects the energy efficiency of a membrane process but is not a realistic indicator for comparing the power requirements of different membrane processes. A parameter called, comparative-kW, is proposed for comparing the power requirements of various membrane based plants operating under a wide range of product water recoveries. Several cases are analysed to illustrate the usefulness of comparative energy parameter, c-kW.

Keywords: Membrane systems; Energy consumption; Desalination; Wastewater; Potable water; High purity water
