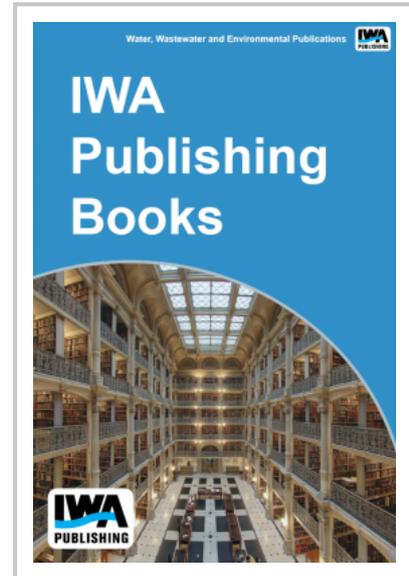


Utilities of the Future Energy Findings

In 1996, the Electric Power Research Institute (EPRI) published a report entitled *Water and Wastewater Industries: Characteristics and Energy Management Opportunities* which described how electricity is used in the water and wastewater treatment sector. EPRI estimated in 2013 that the domestic wastewater sector now uses 30 billion kWh/yr of electric power or 0.8% of the electricity generated nationwide. More recent studies (Shizas and Bagley, 2004; Wett, Buchauer and Fimml, 2007) provide evidence that there is adequate energy embedded in domestic wastewater to significantly offset the power demand for treatment through energy resource recovery at wastewater facilities. To be consistent with the 2013 EPRI study, researchers used EPA's Clean Watershed Needs Survey (CWNS) plant flow and technical process data when available, sorted by the size of the treatment facility along with energy balance and energy demand data generated under another WERF study to develop national energy projections from the domestic wastewater sector. That WERF study (ENER1C12), estimated the potential energy savings from large facilities (>5 mgd) becoming energy neutral based on process information using GPS-x models, available technologies, and energy balances developed for 25 common water resource recovery facility (WRRF) configurations.



The objectives of this study are to:

- Estimate the energy embedded in domestic wastewater in the U.S. relative to the energy required to accomplish treatment.
- Characterize the forms of this energy.
- Project the energy currently used to treat domestic wastewater in the U.S. and estimate the potential energy savings by facilities that become net energy neutral while providing the same or better level of treatment.
- Estimate the cost to convert the facilities with the greatest potential to become energy neutral over the next 20 years and compare the cost of this energy with other energy sources.
- Estimate the cost to maximize energy reduction from the 100 largest water resource recovery facilities.

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Publication Date: 15/11/2014

ISBN13: 9781780406800

eISBN: 9781780406800

Pages: 80

Print:

Standard price: £29 / €36 / \$44

Member price: £22 / €27 / \$33

eBook:

Standard price: £29 / €38 / \$50

Member price: £22 / €29 / \$38