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Evaluation of sewage sludge production and utilization in Greece in the frame of integrated energy recovery

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ABSTRACT

The objectives of this work were to provide an overview of municipal activated sludge units in Greece, to determine the sludge annual production rates and to examine potential for energy utilization of dewatered sludge. 37 wastewater treatment plants, serving a population equivalent of 1.6 million, located throughout Greece, were investigated during this study, in order to determine the sludge production rate after secondary and tertiary wastewater treatment processes. The average sludge production amount was estimated at 0.04 kg dry matter per capita per day, corresponding to an average wastewater production rate of 246 L per capita and day. Tertiary processes resulted to higher amounts of sludge production; nevertheless, such processes are often required aiming to the reclamation of secondary effluents with a high reuse and acceptability potential. Considering the disposal cost of produced sludge, energy utilization could be a promising alternative method for efficient sludge management. Utilization of the energy content of the sludge was examined by using three options, consisting in anaerobic digestion of dewatered sludge, incineration, and anaerobic digestion followed by residue incineration; it was found that excess energy production reached to high values in the case of combined anaerobic digestion and incineration, while single anaerobic digestion resulted to the lowest power production rates.

Keywords: Sewage sludge; Wastewater treatment; Energy utilization; Ddewatered sludge

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