



“Gheorghe Asachi” Technical University of Iasi, Romania



STUDY ON GREENHOUSE GAS EMISSIONS FROM WASTEWATER TREATMENT PLANTS

Doru Lucian Manea^{*}, Elena Elisabeta Manea, Dan Niculae Robescu

*University Politehnica of Bucharest, Department of Hydraulics, Hydraulical Machinery and Environmental Engineering, 313
Splaiul Independentei Street, Bucharest, Romania*

Abstract

One of the causes of climate change is the accumulation of greenhouse gases (GHGs). Methane (CH₄) is one of the greenhouse gases, with an ability to trap heat in Earth's atmosphere 21 times greater than carbon dioxide (CO₂) per unit mass and in the same period of time. Because the lifetime of methane in the atmosphere is relatively short, it could be kept under control. Wastewater treatment plants (WWTPs) are anthropogenic sources of CH₄ emissions. Anaerobic digestion of the sludge resulting from wastewater treatment produces biogas, which contains large amounts of CH₄. The paper aims to study the opportunities to control and even eliminate methane emissions resulted from WWTPs. The main solution to achieve that is by an intensive usage of biogas. The methane contained in the biogas (resulted from sludge anaerobic digestion) can be used for local production of energy required in the WWTP. Power consumption of a WWTP was monitored, together with its biogas production. The necessary consumptions of power and heat were calculated and compared with the potential energy of methane in the biogas obtained. It resulted that an important part of the WWTP energy demand may be covered by implementing a local solution to generate energy from biogas burning. The implementation of systems that produce biogas and use it further to produce energy for own consumption is an important step towards controlling the level of methane in the atmosphere, especially in large WWTPs. The carbon footprint of energy consumption in WWTP is also reduced.

Key words: energy, greenhouse, methane, wastewater

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^{*} Author to whom all correspondence should be addressed: e-mail: manea_doru@yahoo.com; Phone: +(40)765454503