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ESTIMATING BIOGAS PRODUCTION IN THE CONTROLLED LANDFILL OF FEZ (MOROCCO) USING THE LAND-GEM MODEL

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Abstract

In the current era of renewable energy development, biogas holds immense potential for efficient energy recovery from organic waste and substantial reduction of greenhouse gas emissions. However, the adoption of anaerobic digestion in developed countries has experienced measured progress, primarily focusing on municipal waste management, particularly in Morocco, with a significant emphasis on landfill services. This study aims to comprehensively assess the methane quantity and subsequent electrical energy generation from a landfill over the period from 2004 to 2030, utilizing a rigorous mathematical model. According to the Landfill Gas Emissions Model, methane production exhibited a notable rise, escalating from 1.025.000 to 24.060.000 m³/year between 2005 and 2020. Projections indicate a peak methane production of 41.120.000 m³/year by 2034, beyond which production is anticipated to decline to negligible levels. The anticipated electrical energy output, linked to the methane production from the landfill in 2020, is estimated at 83.7 GWh/year.

Key words: biogas, Land-GEM model, landfill, methane, solid waste

Received: November, 2022; Revised final: September, 2023; Accepted: September, 2023; Published in final edited form: November, 2023

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