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## EVALUATION OF CARBON DIOXIDE AND METHANE EMISSION FROM CLUJ-NAPOCA MUNICIPAL LANDFILL, ROMANIA

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### Abstract

The municipal waste landfills are known as important anthropogenic sources of methane and carbon dioxide being the most important greenhouse gases. The present study estimates the methane and carbon dioxide emission from the municipal open dump landfill of Cluj-Napoca (Romania). Two different methods were used: the first method was based on *in situ* measurements, using the closed chamber technique and the second one was based on the 2006 IPCC (Intergovernmental Panel on Climate Change) Waste Model spreadsheet and the default emissions estimated approach for the methane inventory preparation calculation. The IPCC Waste Model was utilized to calculate the emissions, taking into account the specific waste composition and climate information because it can be used with a limited amount of data. This is the first study in which the closed chamber technique was applied on a municipal landfill in Romania. The methane and carbon dioxide emissions determined by *in situ* measurements were estimated at 827 t·y<sup>-1</sup> for methane and 9,102 t·y<sup>-1</sup> for carbon dioxide respectively on an area of approximately 80,000 m<sup>2</sup>. In comparison, the calculated values for methane, by using the IPCC 2006 methodology, were four times higher which means that the 2006 IPCC method overestimates the methane and carbon dioxide emission.

*Key words:* carbon dioxide, closed chamber technique, methane, open dump landfill

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