

# Comparative Analysis of Municipal Solid Waste Treatment Technologies – the case study of Western Macedonia

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## Abstract

This study evaluates the environmental performance of the incineration and landfilling of municipal solid waste that is ready for the final disposal using the life cycle assessment (LCA) methodology. Data from the Prefecture of Western Macedonia and specifically for the regions of Kozani, Kastoria, Grevena and Florina were used to undertake this study. Sanitary Landfill and Incineration of the waste treatment technologies are studied in SimaPro software based on input-output materials flow. SimaPro software has been applied for analyzing environmental burden by different impact categories. All technologies are favorable to abiotic and ozone layer depletion due to energy recovery from the waste treatment facilities. Results indicate that sanitary landfill has the significantly lower environmental impact. However, sanitary landfill has significant impact on photochemical oxidation, global warming and acidification. Landfill with energy recovery facilities is environmentally favorable. However, due to large land requirement, difficult emission control system and long time span, restriction on land filling is applying more in the developed countries. Life cycle assessment is an effective tool to analyze waste treatment technology based on environmental performances.

**Keywords:** Environmental assessment; Incineration; Sanitary landfill