

MSW PROJECT OPPORTUNITY

NOVI SAD LANDFILL

NOVI SAD, SERBIA

MUNICIPALITY OF NOVI SAD

OVERVIEW OF MSW PROJECT

The Novi Sad Landfill began operations in 1980. The Landfill is owned by the Municipality of Novi Sad and operated by the Public Utility Company “Cistoca Novi Sad.” This landfill is a managed landfill with a designed waste footprint of 24 hectares (ha). As of 2011 there are nearly 2.0 million tonnes of waste in place with a total site design capacity of about 2.6 million tonnes. It is anticipated the site will close in 2016.

PROJECT TYPE: Landfill Gas (LFG) projections indicate that a LFG project may be possible at the Novi Sad Landfill. Options include electricity generation, direct utilization, and flaring only. Based on EPA’s projections, a maximum flow of approximately 700 m³/hr of LFG at 50 percent methane could potentially be collected—enough to produce approximately 1.1 MW of electricity. There are also some industries located near the Landfill that could potentially use the LFG as a fuel source in their operations.

The feasibility of any of these projects would require additional information from the Landfill and surrounding area, such as exact locations of electricity distribution and transmission lines and nearby industrial facilities’ energy requirements and interest in pursuing a LFG energy project.

ESTIMATED PROJECT LIFETIME EMISSION REDUCTIONS: 425,000 TCO₂E

LANDFILL LOCATION AND ASSISTANCE REQUESTS



The Municipality of Novi Sad seeks specific cooperation to advance the development of this project:

- Site evaluation and preparation for a LFG energy project.
- A partner or investor to build, own and operate a project.

DISCLAIMER: The information and predictions contained within this poster are based on the data provided by the site owners and operators and site visits conducted by U.S. EPA. The Global Methane Initiative (GMI) cannot take responsibility for the accuracy of these data. It should be noted that conditions on landfills will vary with changes in waste input, management practices, engineering practices, and environmental conditions (particularly rainfall and temperature). GMI does not guarantee the quantity or quality of available landfill LFG from the landfill site, which may vary from the values predicted in this report.

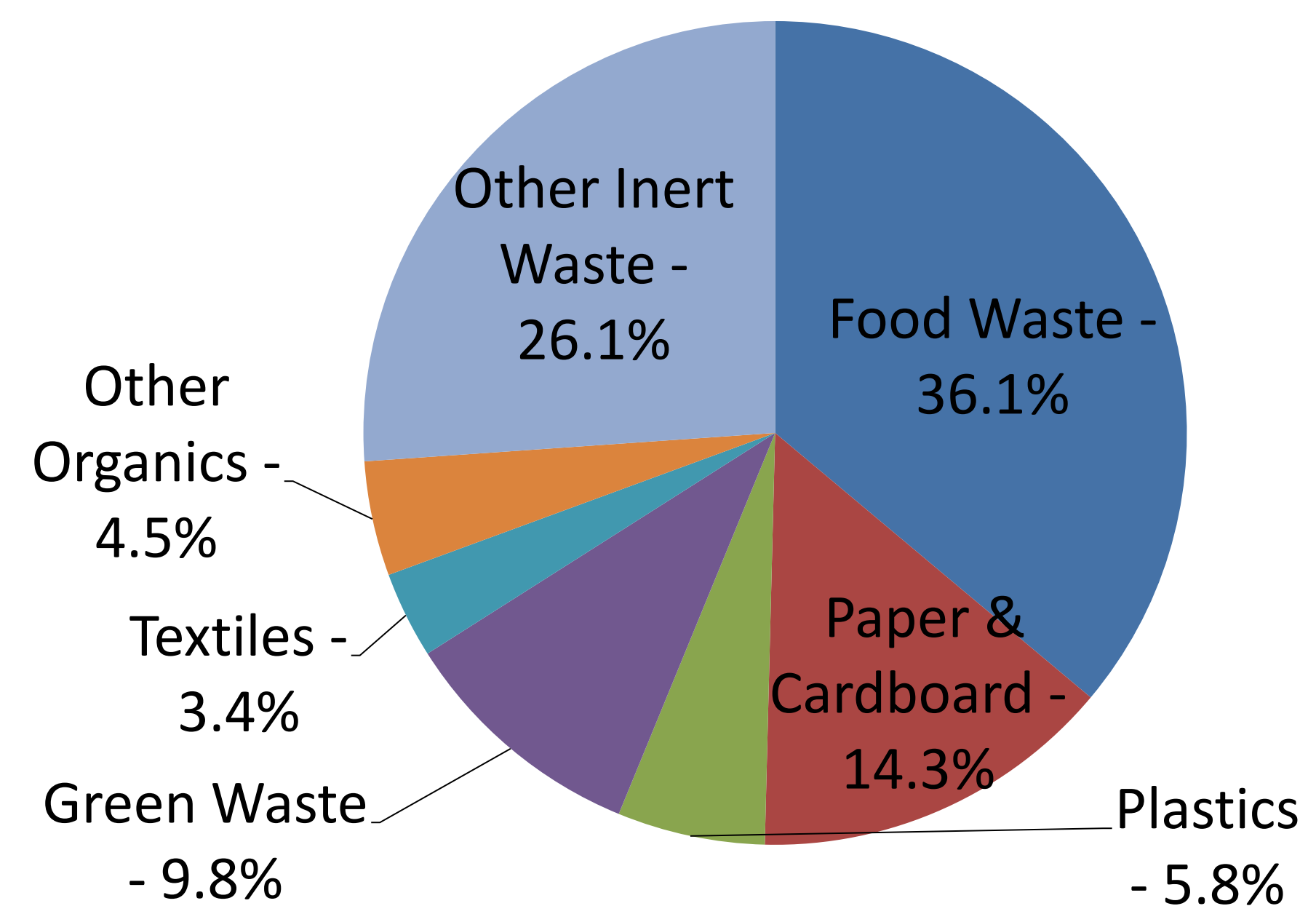
LANDFILL GAS AND ENERGY POTENTIAL

Under a grant from the U.S. EPA, the University of Novi Sad estimated the amount of LFG generated by the Novi Sad Landfill using EPA's Ukraine Landfill Gas Model that was developed by SCS Engineers. Model input data for the preliminary assessment of the methane capture and use project at the Novi Sad Landfill were obtained from the Municipality of Novi Sad and the Public Utility Company "Cistoca Novi Sad."

Other Landfill Physical and Operational Data:

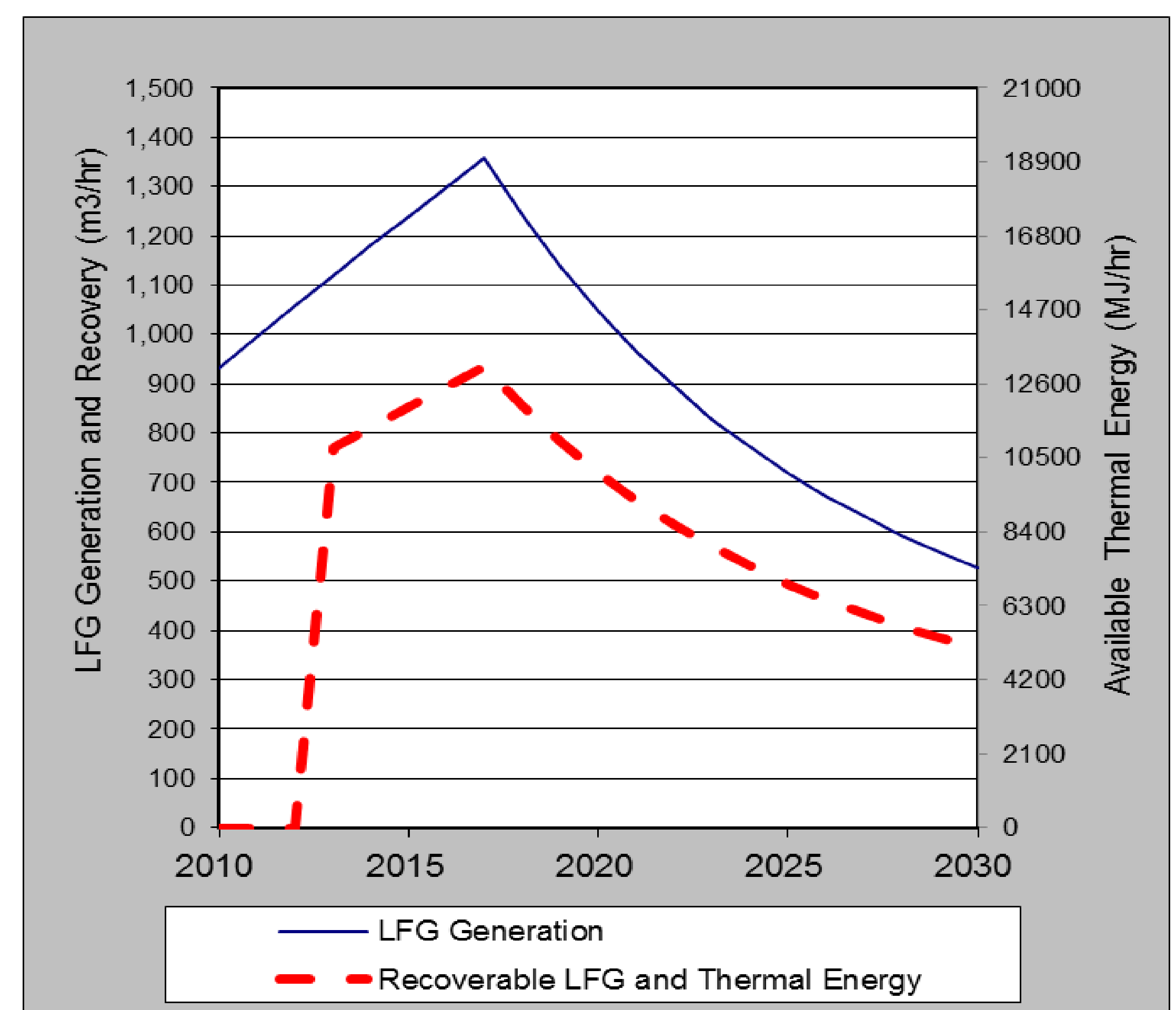
- Site receives about 125,000 tonnes of waste/year and there are nearly 2.0 million tonnes of waste-in-place in 2011.
- No daily cover is used and only one section of the Landfill is closed and covered with about 20 cm of soil.
- Waste is compacted using compactors and bulldozers.
- No engineered leachate collection system; however, leachate is collected in surface canals that run around the landfill and connect with two lagoons.
- 95 passive gas vents have been installed at the Landfill and 67 are currently venting LFG.

Waste Characterization



Landfill Gas Modeling Inputs:

- **CH₄ generation potential (Lo):**
 62 m³/Mg for fast-decay organic waste (e.g. food)
 114 m³/Mg for medium-decay organic waste (e.g. garden)
 193 m³/Mg for slow-decay organic waste (e.g. textiles)
 181 m³/Mg for very slow-decay organic waste (e.g. wood)
- **CH₄ generation rate constant (k):**
 0.15 for fast-decay organic waste (e.g., food)
 0.075 for medium-decay organic waste (e.g., paper)
 0.030 for slow-decay organic waste (e.g., rubber)
 0.015 for very slow-decay organic waste (e.g. wood)
- **Percent methane: 50%**



Values for these modeling variables have been developed based on the waste composition data and average annual precipitation at the Novi Sad Landfill. It is not feasible to collect all the gas generated at the site for flaring or energy recovery given site conditions and collection system limitations. Therefore, the amount of recoverable LFG was estimated by applying a gas availability factor to the results of the LFG generation model (graph above).

Recoverable LFG = 75% Landfill Area Available for Gas Collection x 68% Gas Collection Efficiency = 51%

ENVIRONMENTAL BENEFITS

Assuming that an active gas collection and flaring system is installed in 2014, this landfill capture project has the opportunity to collect and destroy an average of 2.4 million cubic meters of methane annually over a 12 year period. This is equivalent to emission reductions of more than 425,000 tonnes of CO₂e over the life of the project.

Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Tonnes CO₂e from Flaring Activities	39,679	41,679	43,656	45,618	41,690	38,219	35,143	32,413	29,984	27,817	25,880	24,144

FOR MORE INFORMATION

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