

MSW PROJECT OPPORTUNITY SAN JUAN DEL BARRO LANDFILL FLORENCIA, CAQUETA, COLOMBIA Municipality of Florencia

OVERVIEW OF MSW PROJECT

The San Juan del Barro Landfill began operations in 1993. It is owned by the Municipality of Florencia and operated by the private company Servintegral S.A. E.S.P. This landfill is a sanitary landfill with a designed waste footprint of 25.5 hectares (ha), a total design capacity of 2.5 million tonnes, and is expected to close in 2053. Currently, there are approximately 487,000 tonnes of waste in place with an average waste depth of 15 meters.

PROJECT TYPE: Landfill gas (LFG) projections indicate that the San Juan del Barro Landfill could have several LFG utilization project options, including electricity generation, direct use, and flaring only. Assuming start-up of a power plant in 2014, sufficient gas is estimated to be available to support an electricity project with a modest capacity that would gradually grow from 300 to 800 kW over a 41-year period. A direct use project is possible depending on the availability of potential industrial end-users near the landfill.

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, natural gas distribution specifications, energy requirements of nearby industrial facilities, and interest in pursuing a landfill gas energy project.

ESTIMATED PROJECT LIFETIME EMISSION REDUCTIONS: 0.2 MMTCO₂E

PROJECT HIGHLIGHT(S)

The electricity generated by an LFG energy project at the San Juan del Barro Landfill could be used by the site itself for its own energy needs and the excess could potentially be sold to the nearby prison.



The Municipality of Florencia seeks the following types of cooperation to advance the development of this project:

- Project partner and technical assistance.
- Carbon financing.

The Municipality currently does not have a contract to sell carbon credits from any future LFG 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 gas from the landfill site, which may vary from the values predicted in this report.

LANDFILL GAS AND ENERGY POTENTIAL

Under contract to the U.S. EPA, SCS Engineers estimated the amount of LFG generated by the San Juan del Barro Landfill using EPA's Colombia LFG Model. Model input data for the preliminary assessment of the landfill gas capture and use project were obtained from the Servintegral S.A ESP and collected during an EPA site visit in August 2009. The assessment report is available online at the GMI website: www.globalmethane.org/activities/indexact.aspx?sector=landfill

Other Landfill Physical/Operational Data

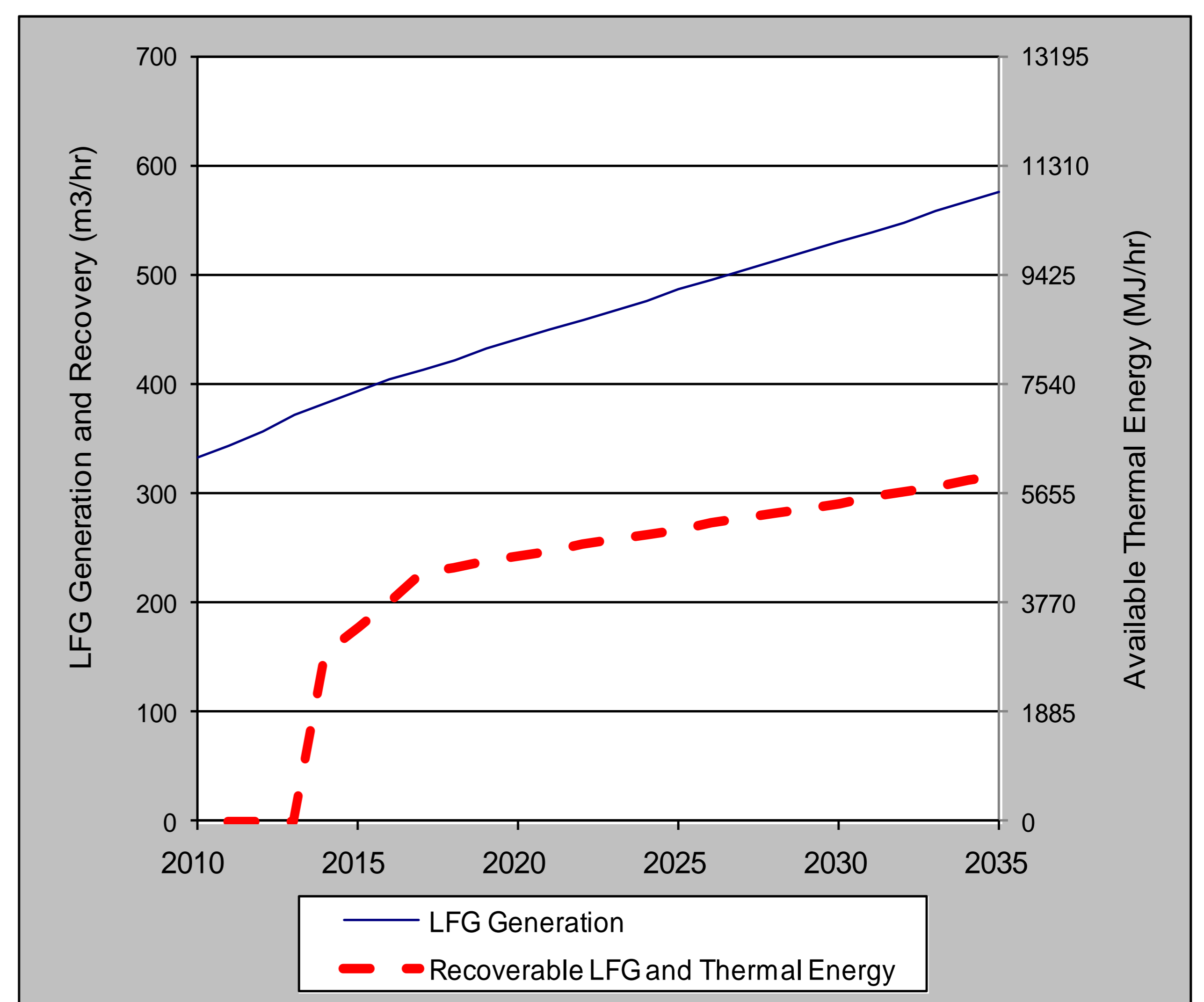
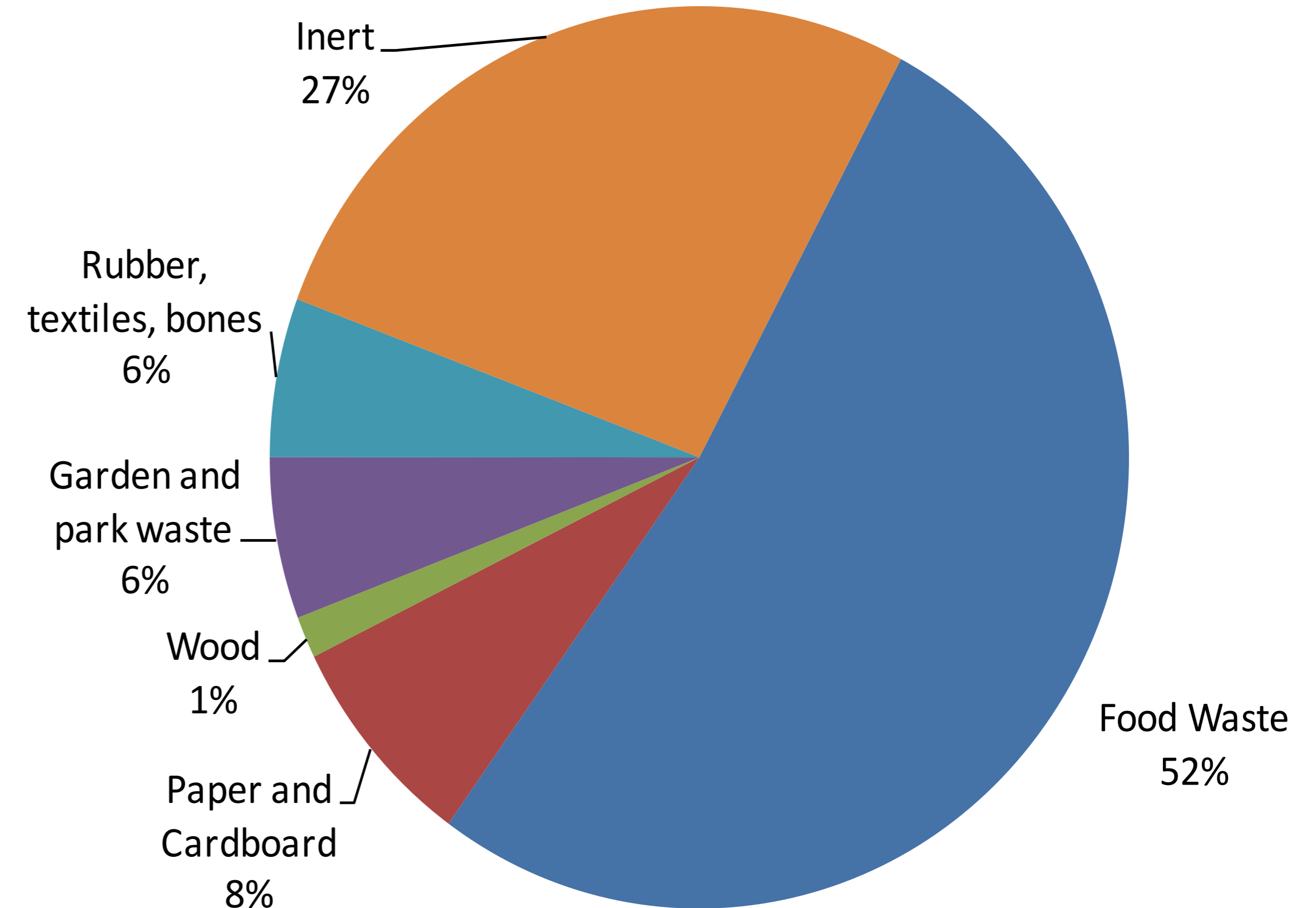
- Estimated annual MSW acceptance rates for 1993 to 2053: ranges from 23,500 to 63,300 tonnes/yr
- Landfill is lined with clay
- Waste compaction is performed with a bulldozer
- Leachate management: Accumulating in standing pools, and evaporated in evaporation ponds. Some leachate is recirculated during the dry season.
- Landfill gas collection and control system: passive venting wells installed.

Landfill Gas Modeling Inputs:

- CH₄ generation potential (Lo):
70 m³/Mg for very fast-decay organic waste
93 m³/Mg for moderately-fast decay organic waste
161 m³/Mg for moderately-slow decay organic waste
200 m³/Mg for slow-decay organic waste
- CH₄ generation rate constant (k):
0.40 for fast-decay organic waste
0.17 for medium-fast decay organic waste
0.070 for medium-slow decay organic waste
0.035 for slow-decay organic waste
- Percent methane: 50%

Values for these modeling variables have been developed based on the waste composition data and average annual precipitation at San Juan del Barro 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.

Waste Characterization



Recoverable LFG = 90% Landfill Area Available for Gas Collection x 61% Gas Collection Efficiency = 55%

ENVIRONMENTAL BENEFITS

Assuming that an active gas collection and flaring system is installed in 2014, this landfill gas capture project has the opportunity to collect and destroy an average of 1.0 million cubic meters of methane annually over the next 13 years. This is equivalent to emission reductions of more than 199,000 tonnes of CO₂eq over the project lifetime.

Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Tonnes CO ₂ eq from Flaring Activities	10,095	11,681	13,314	14,994	15,326	15,658	15,987	16,316	16,642	16,967	17,290	17,611	17,931

FOR MORE INFORMATION

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