

MSW PROJECT OPPORTUNITY

“CENTRAL DE RESIDUOS VALE DO AÇO” LANDFILL SANTANA DO PARAISO, MINAS GERAIS, BRAZIL MUNICIPALITY OF SANTANA DO PARAISO

OVERVIEW OF MSW PROJECT

The “Central de Resíduos Vale do Aço” (CRVA) Landfill began operations in 2003. It is owned by the Municipality of Santana do Paraíso and is operated under concession by Vital Engenharia Ambiental S.A. This landfill is a sanitary landfill with a designed waste footprint of 44.38 hectares (ha), a total design capacity of 2.11 million tonnes, and is expected to close in 2025. Currently, there are approximately 750,000 tonnes of waste in place with an average waste depth of 20 meters.

PROJECT TYPE: Landfill gas (LFG) projections indicate that the CRVA Landfill could have several LFG utilization project options. These options include electricity generation, direct use, transportation fuel LFG to CNG, and flaring only. Assuming start-up of a power plant in 2015, sufficient gas is assumed to be available to support a power plant of about 1.1 MW in 2015, 1.9 MW in 2020, and 1.8 MW (maximum value) in 2025. A direct use project is possible depending on the availability of potential end-users near the landfill. This landfill is located adjacent (within a radius of 5 km) to different industrial centers that could serve as potential end-users of the LFG.

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: 0.73 MMTCO₂E

LANDFILL LOCATION AND ASSISTANCE REQUESTS



The Municipality of Santana do Paraíso seeks specific cooperation to advance the development of this project:

- A partner or investor to build, own, and operate a project.
- Technical assistance.

The project owner does not have a contract to sell its carbon credits.

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 CRVA Landfill using the EPA and SCS models. Model input data for the preliminary assessment of the LFG capture and use project were obtained from the Vital Engenharia Ambiental S.A. and collected during an EPA site visit in April 2010. The assessment report is available online at the GMI website: www.globalmethane.org

Other Landfill Physical/Operational Data

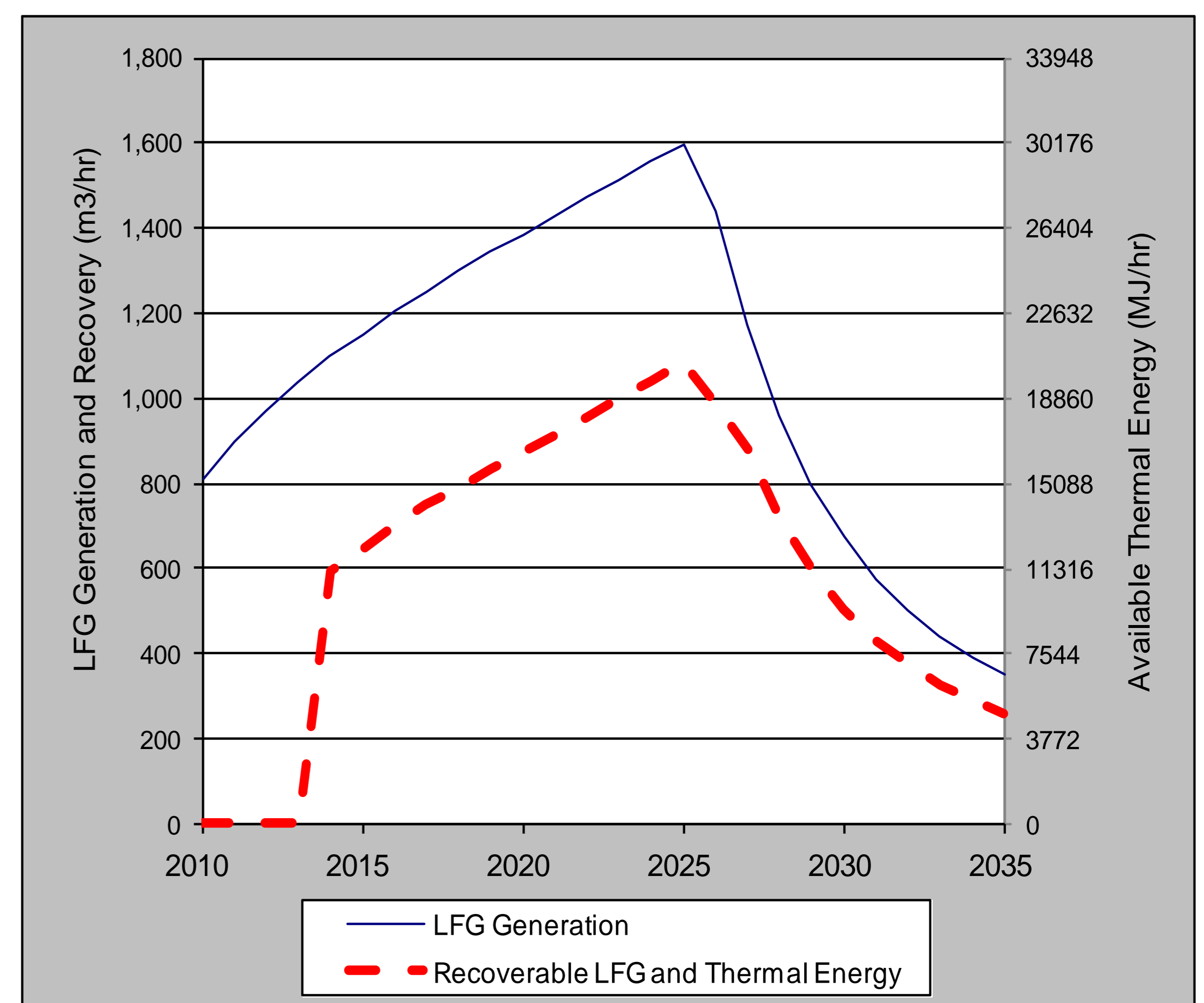
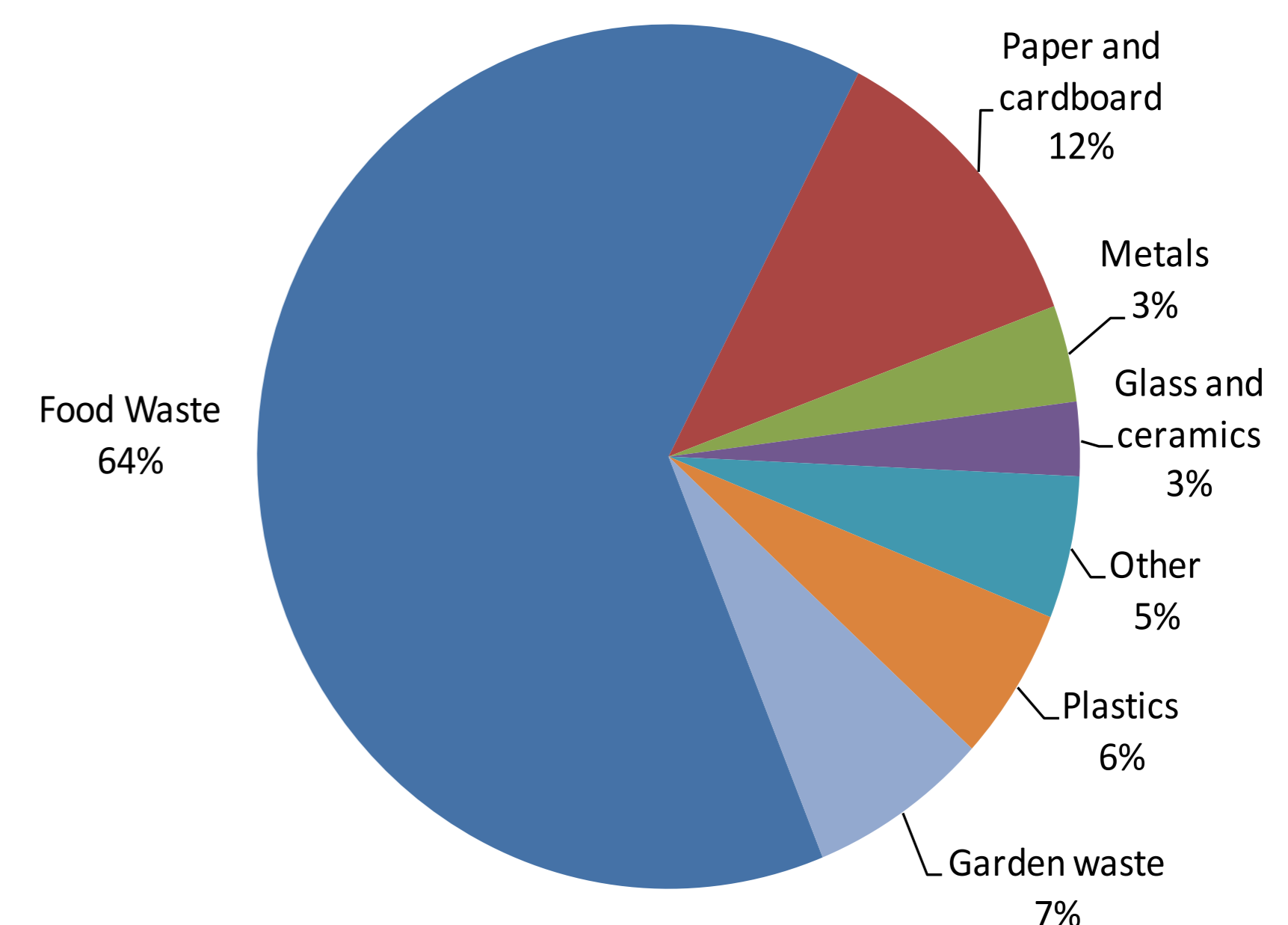
- Estimated annual MSW acceptance rates for 2003 to 2025: ranges from 13,300 to 121,800 tonnes/yr
- Landfill is lined with a clay and an geomembrane layer (HDPE)
- Waste compaction is performed with a bulldozer
- Leachate management: collected at the base of the landfill and is hauled off site and treated at the sewage treatment station
- LFG collection and control system: passive venting wells installed.

Landfill Gas Modeling Inputs:

- CH₄ generation potential (Lo): 79 m³/Mg
- CH₄ generation rate constant (k):
0.30 for fast-decay organic waste (e.g., food)
0.06 for medium-decay organic waste (e.g., paper)
- Percent methane: 50%

Values for these modeling variables have been developed based on the waste composition data and average annual precipitation at CRVA 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 73% Gas Collection Efficiency = 66%

ENVIRONMENTAL BENEFITS

Assuming that an active gas collection and flaring system is installed in 2014, this LFG capture project has the opportunity to collect and destroy an average of 7.5 million cubic meters of methane annually over the next 13 years. This is equivalent to emission reductions of more than 737,200 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 | 39,077 | 42,548 | 46,023 | 49,524 | 52,215 | 54,906 | 57,612 | 60,344 | 63,112 | 65,922 | 68,781 | 71,693 | 65,446 |

FOR MORE INFORMATION

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