

# MSW PROJECT OPPORTUNITY

## 1113 LANDFILL

### CANCUN, QUINTANA ROO, MEXICO

### MUNICIPALITY OF BENITO JUAREZ

#### OVERVIEW OF MSW PROJECT

The 1113 Landfill began operations in 2006. It is owned by the Municipality of Benito Juarez, managed by SIRE SOL (public) and operated by Protección Ambiental Contenedores S.A. de C.V (private). This landfill is a sanitary landfill with a designed waste footprint of 15 hectares (ha), a total design capacity of 1.95 million tonnes, and is expected to close in 2013. Currently, there are 1.8 million tonnes of waste in place with an average waste depth of 18 meters.

**PROJECT TYPE:** Landfill gas (LFG) projections indicate that the 1113 Landfill could have several LFG utilization project options. These options include electricity generation, direct use, and flaring only. Assuming start-up of a power plant in 2014, sufficient gas is assumed to be available to support a power plant of 1.6 MW in 2014, decline to 1.0 MW by 2019, and 0.5 MW by 2028. A direct use project is possible depending on the availability of potential end-users near the Landfill. Note that the closed Norte Landfill, which is also owned by the Municipality of Benito Juarez, is located 4 km away and has an active LFG system. One possible project would be to pipe LFG from the 1113 Landfill and combine the LFG from the two landfills, which may make project economics more favorable.

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 distributors specifications, nearby industrial facilities' energy requirements and interest in pursuing a LFG energy project.

**ESTIMATED PROJECT LIFETIME EMISSION REDUCTIONS: 0.5 MMTCO<sub>2</sub>E**

#### LANDFILL LOCATION AND ASSISTANCE REQUESTS



The Municipality of Benito Juarez seeks specific cooperation to advance the development of this project:

- 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 1113 Landfill using EPA's Mexico LFG Model v2. Model input data for the preliminary assessment of the LFG capture and use project were obtained from the Municipality of Benito Juarez and collected during an EPA site visit in August 2012. The assessment report is available online at the GMI website: [www.globalmethane.org](http://www.globalmethane.org).

## Other Landfill Physical/Operational Data

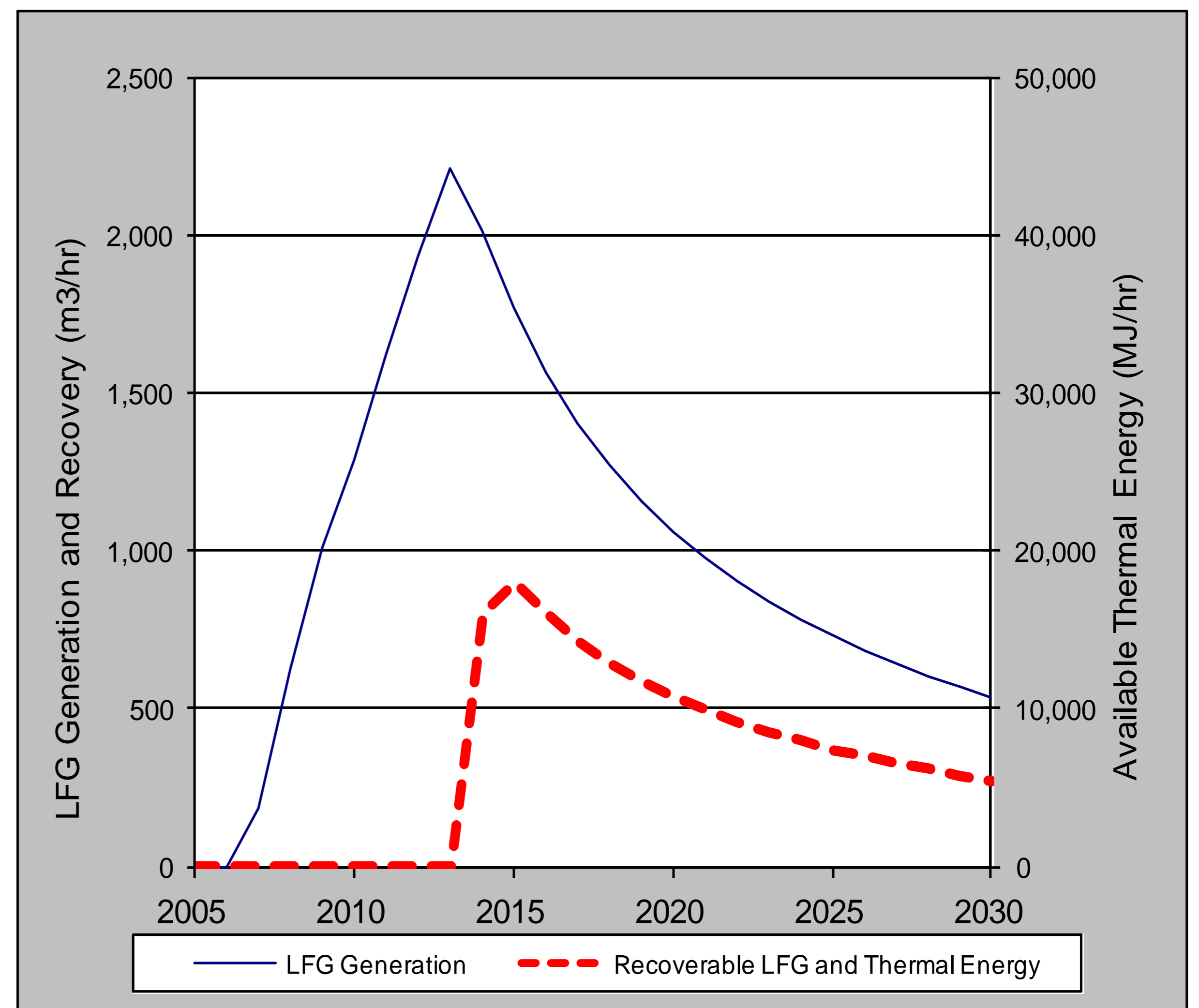
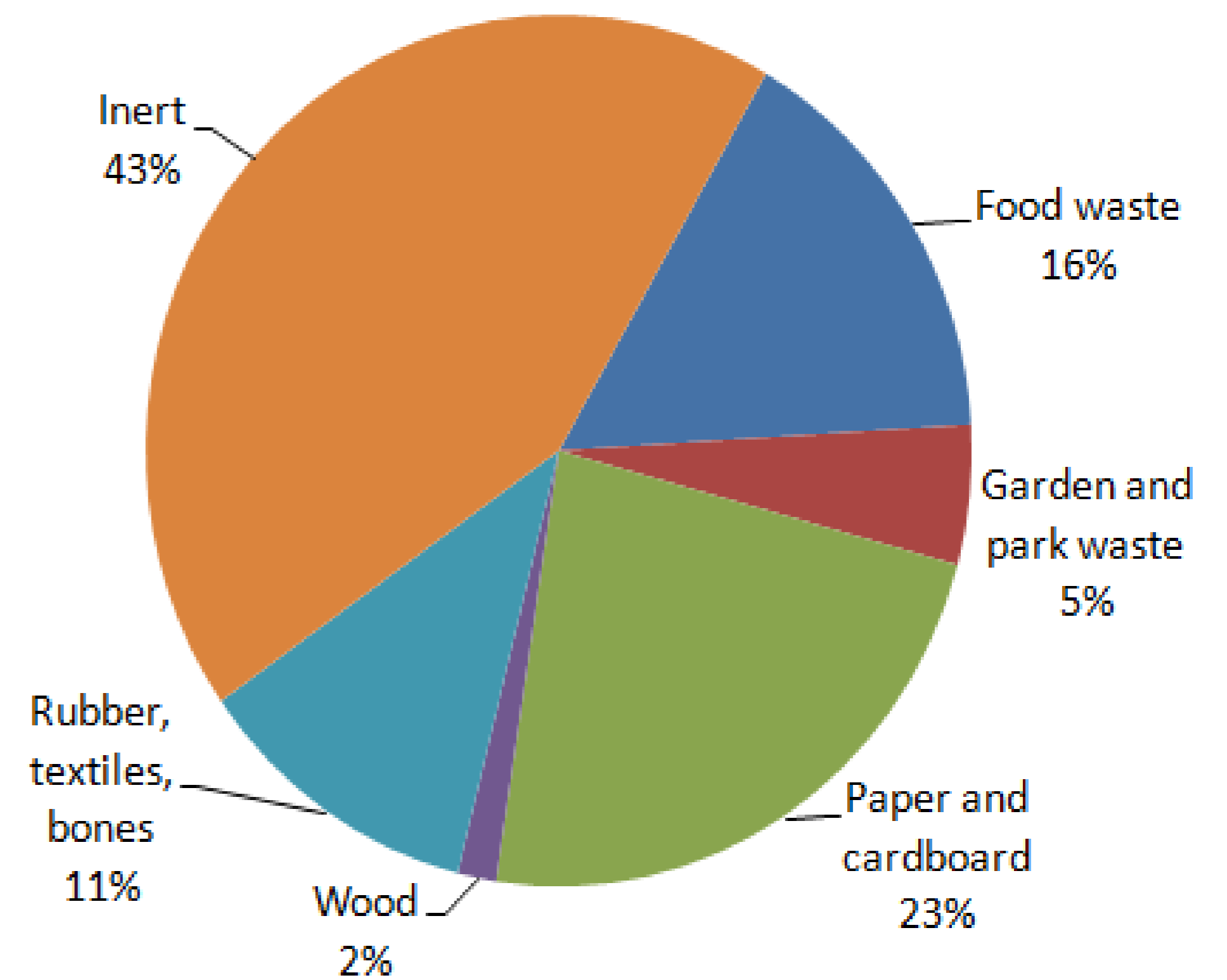
- Estimated annual MSW acceptance rates for 2006 to 2012: ranges from 106,000 to 314,000 tonnes/yr
- Landfill is lined with composite geomembrane
- Waste compaction is performed with a bulldozer
- Leachate management: accumulating in standing pools
- LFG collection and control system: passive venting wells installed.

## Landfill Gas Modeling Inputs:

- CH<sub>4</sub> generation potential (Lo):  
65 m<sup>3</sup>/Mg for very fast-decay organic waste  
131 m<sup>3</sup>/Mg for moderately-fast decay organic waste  
203 m<sup>3</sup>/Mg for moderately-slow decay organic waste  
192 m<sup>3</sup>/Mg for slow-decay organic waste
- CH<sub>4</sub> generation rate constant (k):  
0.30 for fast-decay organic waste  
0.13 for medium-fast decay organic waste  
0.050 for medium-slow decay organic waste  
0.025 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 1113 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 54% Gas Collection Efficiency = 49%**

## 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 2.6 million cubic meters of methane annually over the next 13 years. This is equivalent to emission reductions of more than 0.5 million tonnes of CO<sub>2</sub>eq over the project lifetime.

Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Tonnes CO <sub>2</sub> eq from Flaring Activities	55,881	63,025	55,890	50,049	45,207	41,143	37,687	34,713	32,125	29,848	27,825	26,012	24,375

## FOR MORE INFORMATION

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