

MSW PROJECT OPPORTUNITY

Changshankou Landfill

Wuhan City, Hubei Province, China

China Wuhan Urban Administration Bureau

OVERVIEW OF MSW PROJECT:

Changshankou Landfill, which began filling in 2009, is owned by China Wuhan Urban Administration Bureau. Changshankou is a sanitary type of landfill with a designed area of waste placement totaling 55 hectares. Currently, there are 2.6 million tonnes of waste in place with an average waste depth of 20 meters. The designed landfill capacity is 18.8 million tons, with current waste projections reaching 7.9 million tons of waste disposed by 2029. The site has an estimated 100% of municipal wastes in place.

TYPE OF PROJECT: LFG Energy Recovery

ESTIMATED AVERAGE ANNUAL EMISSION REDUCTIONS: 184,000 MTCO₂E

PROJECT HIGHLIGHT

- An advanced leachate treatment system reduces leachate levels in the waste mass, promoting more efficient gas collection.

ENVIRONMENTAL BENEFITS

Assuming that a gas collection and flaring or energy system is installed in 2013, this landfill capture project has the opportunity to collect and destroy an average of 12.2 million cubic meters of methane annually over the next 15 years. This is equivalent to emission reductions of more than 184,000 tonnes of CO₂ annually.

Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Tonnes CO₂eq from Flaring Activities	142,551	152,962	161,835	169,395	175,837	181,327	186,005	189,992	193,389	196,283	198,750	200,852	202,643	204,170	205,471



GMI conducted a pre-feasibility study in support of this 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 biogas from the landfill site, which may vary from the values predicted in this report.

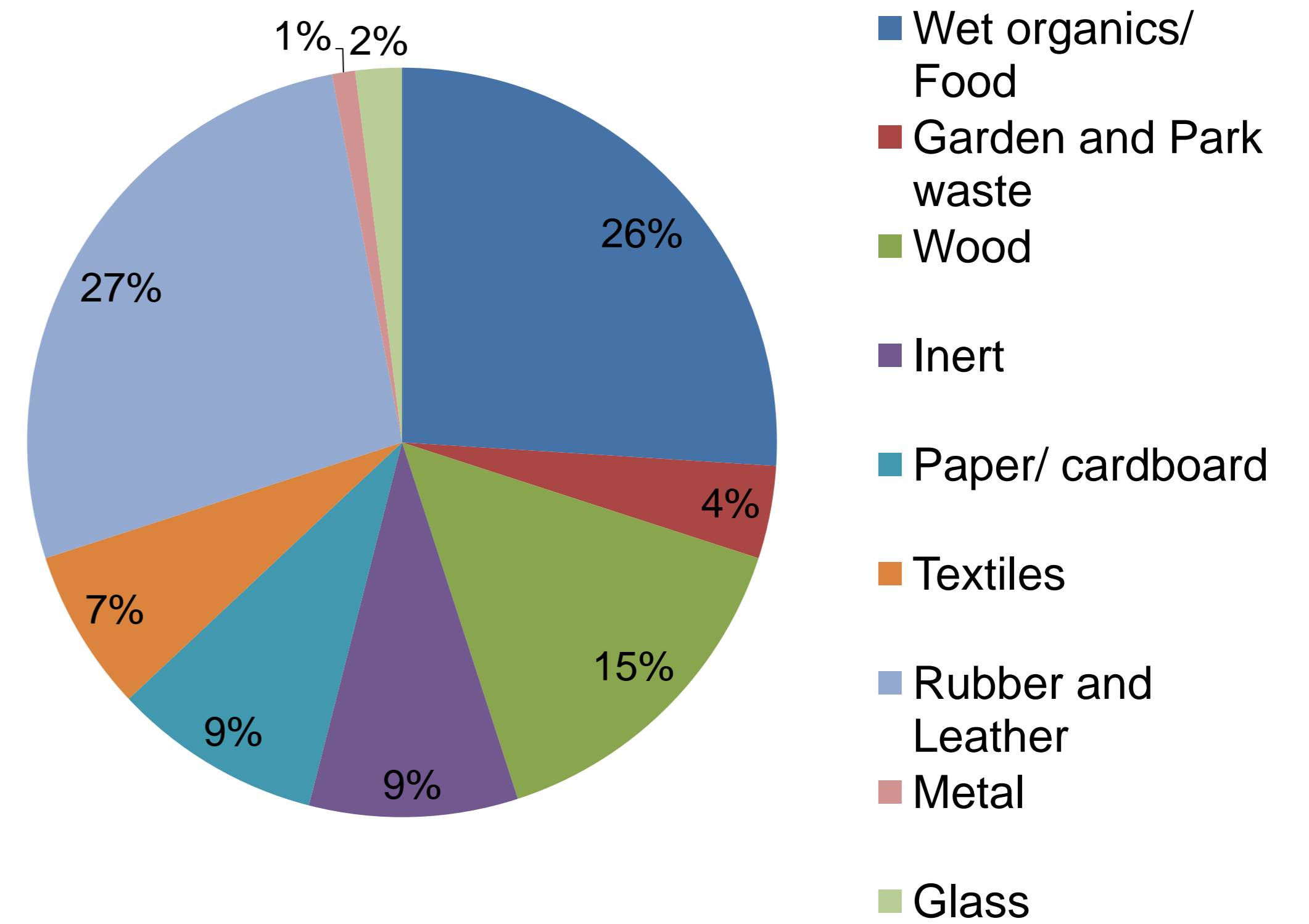
LANDFILL GAS AND ENERGY POTENTIAL

Under contract to the U.S. EPA, OWT H.K. estimated the amount of biogas generated by the Changshankou Landfill using the EPA China Biogas model. Model input data for the preliminary assessment of a landfill methane capture and use project were provided by Wuhan Urban Administration Bureau collected during EPA site visits in January 2013.

Other Landfill Physical/Operational Data

- Quantity of waste accepted annually: ranges from 360,000 to 700,000 tonnes
- Daily cover is not used
- Landfill site is capped with geomembrane
- Landfill is lined with geomembrane
- Landfill gas collection and control system: passive vent installed
- Number of vertical wells: 35
- Average depth of wells: 25 meters
- Leachate management: anaerobic aeration and membrane bioreactor (400 m³ per day)

Waste Characteristics

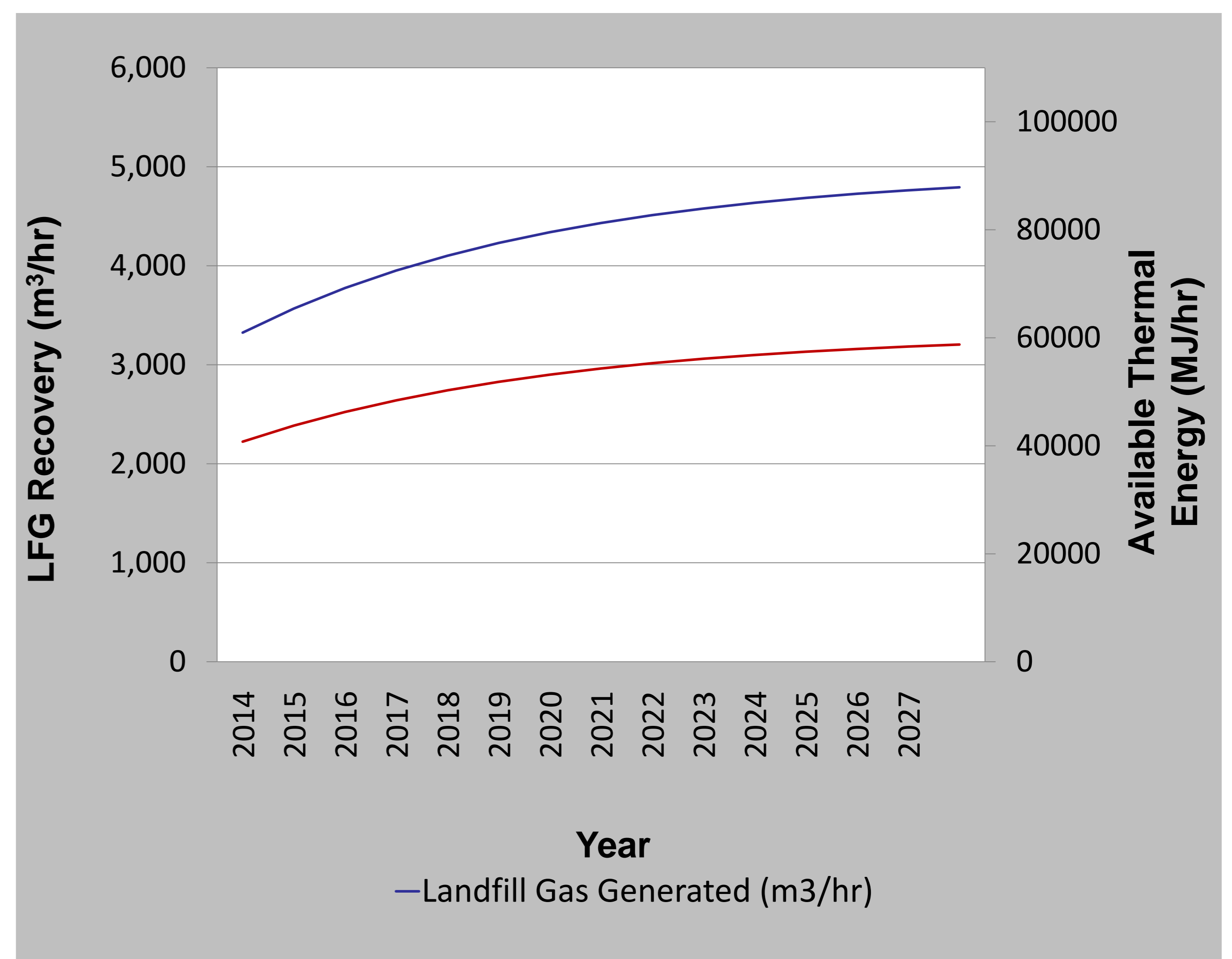


Biogas Modeling Inputs:

- CH₄ generation potential (Lo): 60 m³/Mg
- CH₄ generation rate constant (k): 0.16
- Percent methane: 50%
- Gas availability factor: 46%

Values for these modeling variables have been developed based on the waste composition data and average annual precipitation at Changshankou. 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 biogas was estimated by applying a gas availability factor to the results of the biogas generation model.

Estimated Landfill Gas and Energy Recovery Curve



Recoverable Biogas = 70% Landfill Area Available for Gas Collection x 65% Gas Collection Efficiency = 46%

FOR MORE INFORMATION

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