



MSW PROJECT OPPORTUNITY

DERGACHI LANDFILL

Kharkiv Oblast, Ukraine

City of Kharkiv

OVERVIEW OF MSW PROJECT

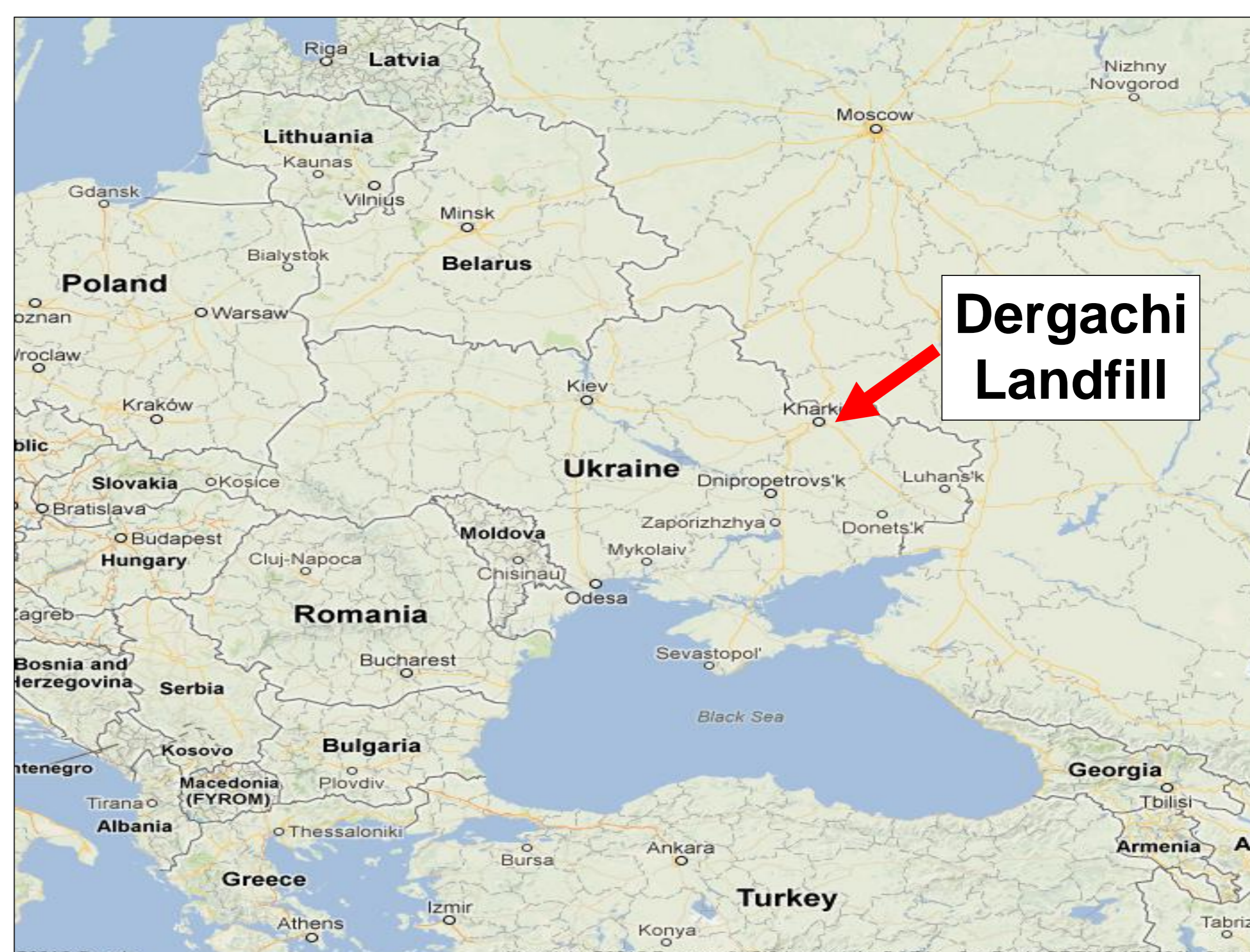
The Dergachi Landfill is owned and operated by the City of Kharkiv. The Dergachi Landfill began as a waste dump that operated from 1975 to 1998 (Cell 1). Cell 1 is 20 hectares in size with 4 million tonnes of waste in place and has a partial clay cover. Cell 2 was constructed in 1998 and accepted 1.3 millions tonnes of waste until 2005. Cell 3 was created in 2006 and collected 1.4 million tonnes of waste until 2011. Cell 4 began operation in 2011 and currently accepts waste with approximately one or two more years of capacity. There are plans for constructing the 5th cell of 15 hectares (ha) with an estimated 4.0 million tonnes of waste capacity. Currently, there are approximately 7.1 millions tonnes of waste in place. This landfill has a designed waste footprint of 45 ha, a total design capacity of 11.3 million tonnes, and is expected to close in 2025.

Landfill gas (LFG) projections indicate that the Dergachi 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 LFG is assumed to be available to support a power plant of 2.2 MW in 2014 that will increase to 3.8 MW by 2026, and then decline to 1.5 MW by 2040.

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: 1.38 MMTCO₂E

LANDFILL LOCATION AND ASSISTANCE REQUESTS



The City of Kharkiv seeks specific cooperation to advance the development of this project:

- Site evaluation and preparation for an LFG energy project.
- A partner or investor to build, own, and operate a project.
- The Landfill does not have a contract for an LFG project at this time.

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 and SEC Biomass estimated the amount of LFG generated by the Dergachi Landfill using EPA's Ukraine Landfill Gas Model. Model input data for the preliminary assessment of the LFG capture and use project were obtained from the Landfill and SEC Biomass and the data were collected during a site visit in January 2013. The final assessment report will be available online at the GMI website: www.globalmethane.org.

Other Landfill Physical/Operational Data

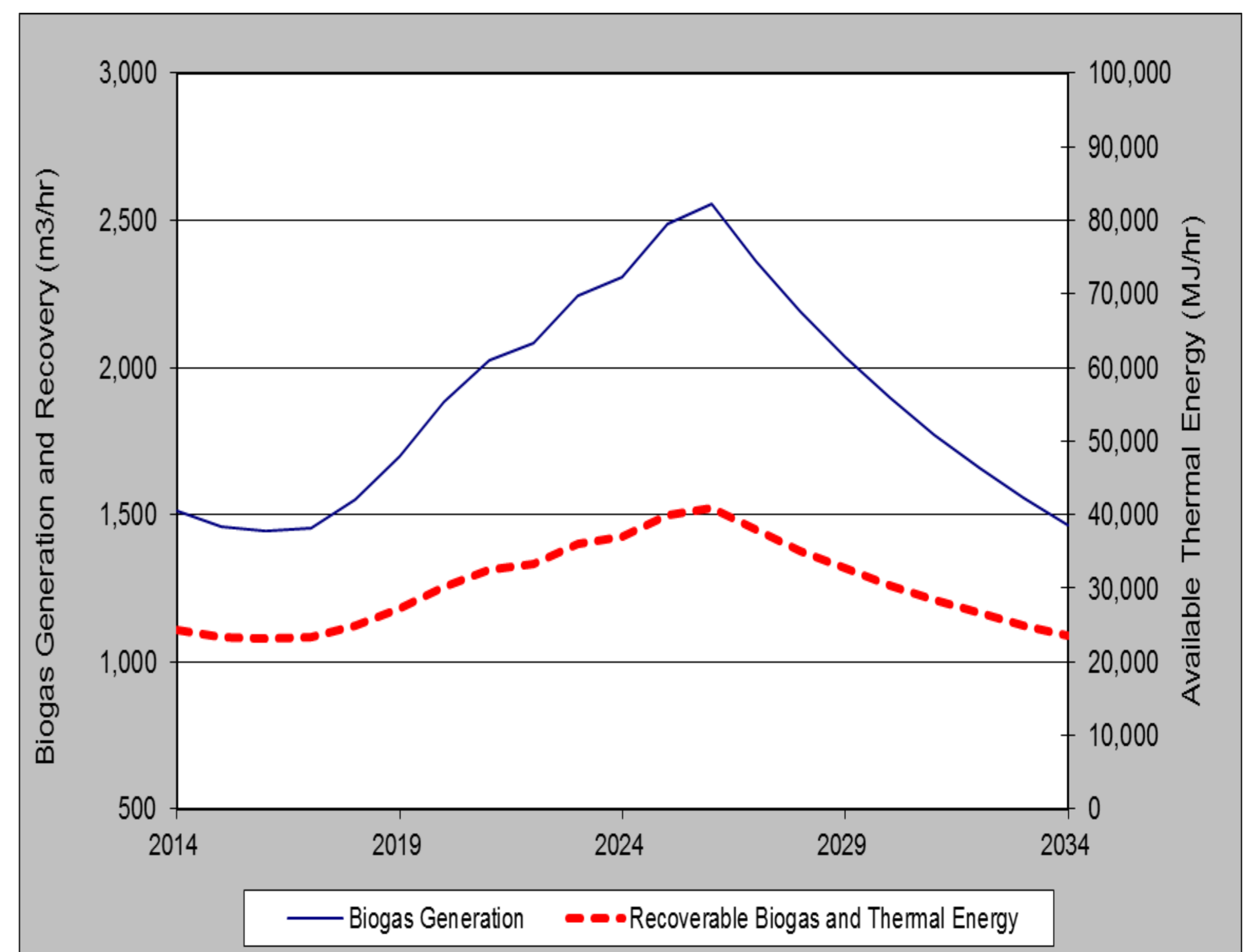
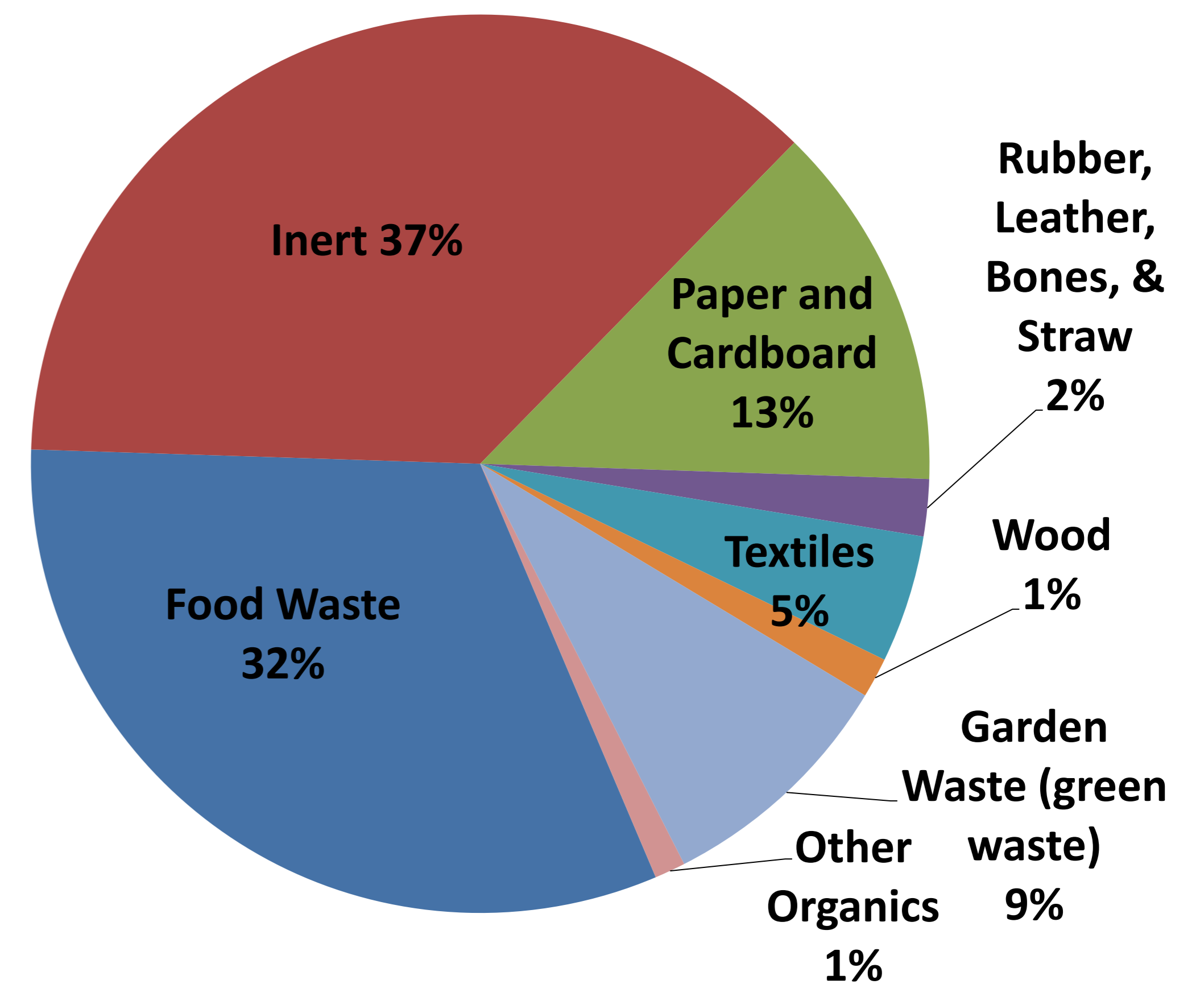
- Estimated annual MSW acceptance rates for 2006 to 2011: ranges from 147,000 to 306,000 tonnes/yr
- Landfill is partly lined with clay (Cells 2-3) and composite geomembrane (Cell 4)
- Waste compaction is performed with a bulldozer
- Leachate management: accumulating by drainage system in vessel and sent to local wastewater treatment facility
- Landfill gas collection and control system: none currently installed

Landfill Gas Modeling Inputs:

- CH₄ generation potential (Lo):
55 m³/Mg for very fast-decay organic waste
101 m³/Mg for moderately-fast decay organic waste
171 m³/Mg for moderately-slow decay organic waste
161 m³/Mg for slow-decay organic waste
- CH₄ generation rate constant (k):
0.140 for fast-decay organic waste
0.070 for medium-fast decay organic waste
0.028 for medium-slow decay organic waste
0.014 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 the Dergachi 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 landfill gas capture project has the opportunity to collect and destroy an average of 7.1 million cubic meters of methane annually over the next 13 years. This is equivalent to emission reductions of more than 1.38 million 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	84,722	81,755	80,832	81,623	87,095	95,139	105,556	113,336	116,698	125,731	129,357	139,357	143,269

FOR MORE INFORMATION

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