

MSW PROJECT OPPORTUNITY

CERRO COLORADO LANDFILL

CALAMA, CHILE

MUNICIPALITY OF CALAMA

OVERVIEW OF MSW PROJECT

The Cerro Colorado Landfill began operations in 2004. It is owned by the Municipality of Calama and is operated by the private commercial company Alvarez and Alvarez LTDA. This landfill is a sanitary landfill with a designed waste footprint of 10 hectares (ha), a total design capacity of just over one million tonnes, and is expected to close in 2024. Currently, there are about 392,000 tonnes of waste in place.

PROJECT TYPE: Landfill gas (LFG) projections indicate that the Cerro Colorado Landfill could have a couple LFG utilization project options. These options include electricity generation and flaring only. Assuming start-up and testing of a power plant in 2014, sufficient gas is assumed to be available to support a power plant of at least 200 kW from 2015 to 2050. The Landfill is located in a remote area outside of the City of Calama so the implementation of a direct use project may be limited as very few potential end-users are located 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 and the location of any potential LFG energy end-users near the landfill and their interest in pursuing a LFG energy project.

ESTIMATED PROJECT LIFETIME EMISSION REDUCTIONS: 150,000 MTCO₂E

LANDFILL LOCATION AND ASSISTANCE REQUESTS



The Municipality of Calama seeks specific cooperation to advance the development of this 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.

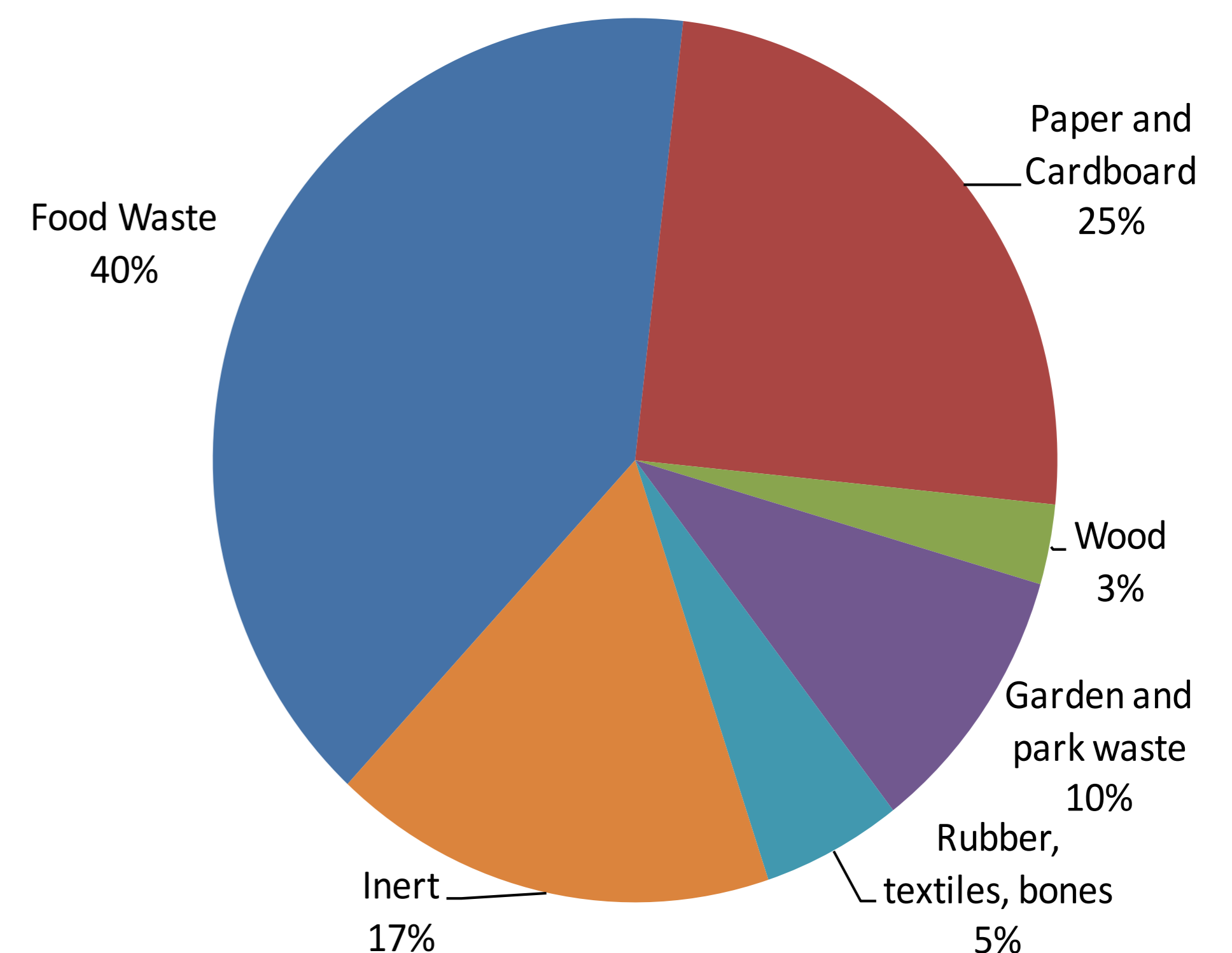
LANDFILL GAS AND ENERGY POTENTIAL

Under contract to the U.S. EPA, SCS Engineers estimated the amount of LFG generated by the Cerro Colorado Landfill using EPA and SCS models. Model input data for the preliminary assessment of the LFG capture and use project were obtained from Alvarez and Alvarez LTDA during an EPA site visit in December 2012.

Other Landfill Physical/Operational Data

- Estimated annual MSW acceptance rates for 2004 to 2024: ranges from 33,500 to 63,300 tonnes/yr
- Landfill is lined with a HDPE geomembrane and clay material
- Waste compaction is performed with a bulldozer
- No organized leachate management system exists at the Landfill
- LFG collection and control system: passive venting wells installed.

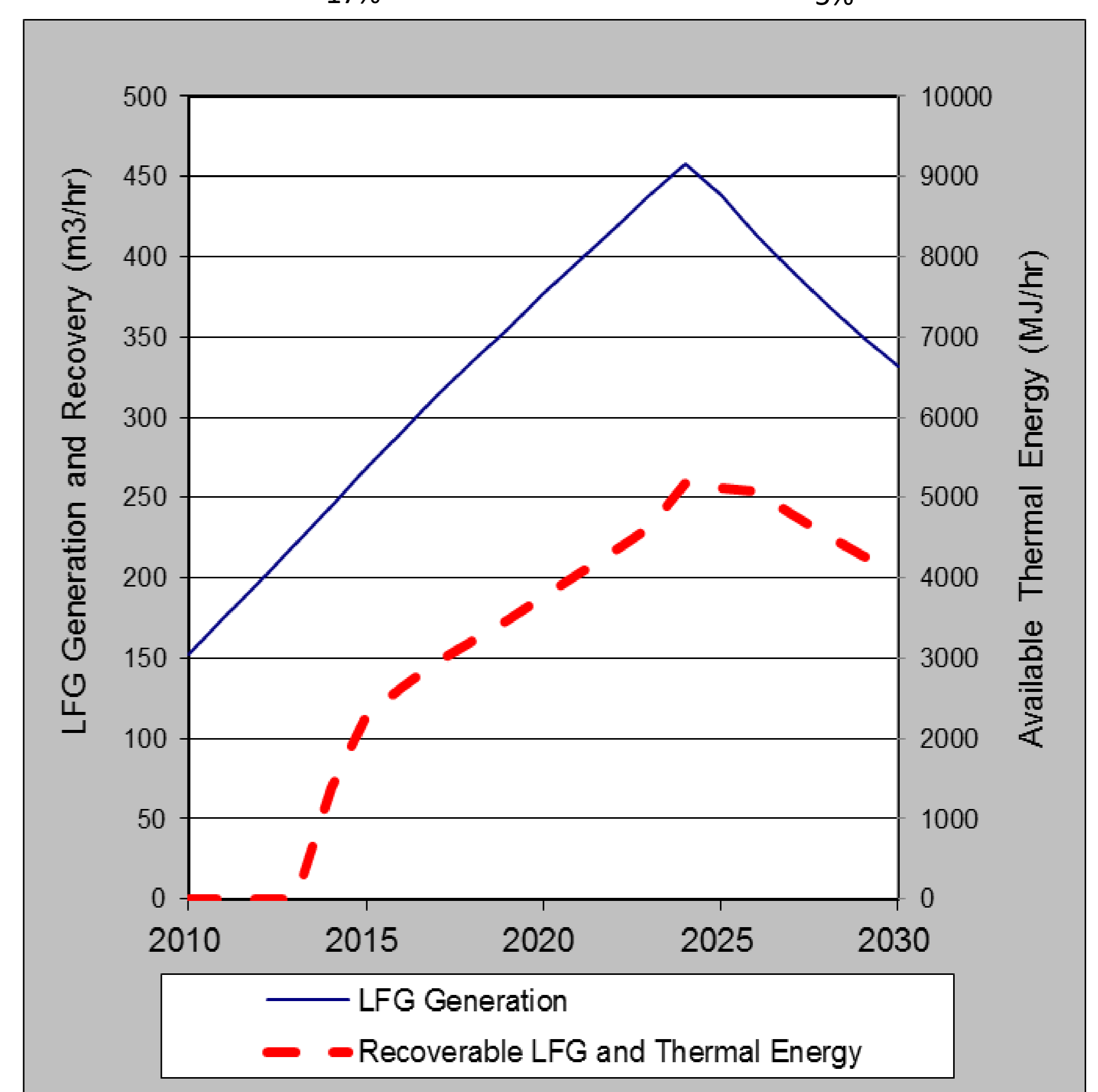
Waste Characterization



Landfill Gas Modeling Inputs:

- CH₄ generation potential (Lo):
1,642 for fast-decay organic waste (e.g., food)
4,443 for medium-decay organic waste (e.g., garden)
3,962 for very slow-decay organic waste (e.g., wood)
- CH₄ generation rate constant (k):
0.080 for fast-decay organic waste (e.g., food)
0.016 for medium-decay organic waste (e.g., paper)
0.004 for slow-decay organic waste (e.g., rubber)
- Percent methane: 50%

Values for these modeling variables have been developed based on the waste composition data and average annual precipitation at the Cerro Colorado 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.



Recoverable LFG = 90% Landfill Area Available for Gas Collection x 57% Gas Collection Efficiency = 51%

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 833,000 cubic meters of methane annually over the next 12 years. This is equivalent to emission reductions of more than 150,000 metric tonnes of CO₂eq over the life of the project.

Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Tonnes CO ₂ eq from Flaring Activities	4,849	7,959	9,204	10,316	11,251	12,201	13,168	14,152	15,156	16,179	18,128	17,909

FOR MORE INFORMATION

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