

# MSW PROJECT OPPORTUNITY

## OJOS NEGROS LANDFILL

### ENSENADA, BAJA CALIFORNIA, MEXICO

#### PROMOTORA AMBIENTAL SAB DE C.V. (PASA)

### OVERVIEW OF MSW PROJECT

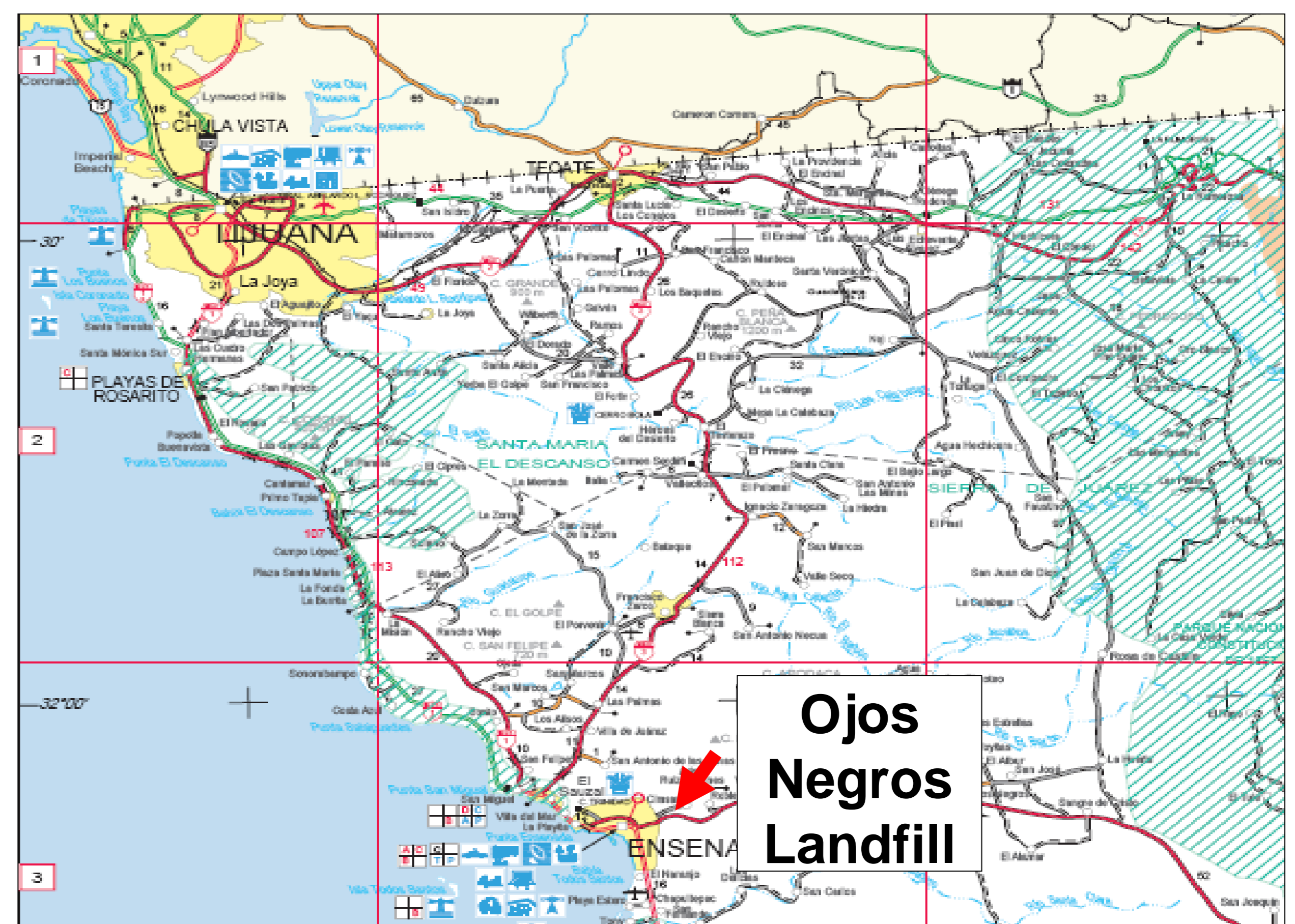
The Ojos Negros Landfill began operations in 2004 and is owned and operated by PASA. This landfill is a sanitary landfill with a designed waste footprint of 20 hectares (ha), a total design capacity of 3.3 million tonnes, and is expected to close in 2024. Currently, there are 1.4 million tonnes of waste in place with an average waste depth of 35 meters.

**PROJECT TYPE:** Landfill gas (LFG) projections indicate that the Ojos Negros 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 0.63 MW starting in 2014, and an additional 0.63 MW in 2021 until 2028. In 2028 the plant capacity will decrease back to 0.63 MW until 2038. A direct use project is possible depending on the availability of potential end-users near the landfill. Note that the closed Ensenada Landfill is located 6 kilometers away. One possible project would be to combine LFG from the Ojos Negros Landfill and the closed Ensenada Landfill, 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 an LFG energy project.

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

### LANDFILL LOCATION AND ASSISTANCE REQUESTS



PASA seeks specific cooperation to advance the development of this project:

- Conduct a pre-feasibility study at the site

PASA 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 Ojos Negros Landfill using GMI's Mexico LFG Model v2. Model input data for the preliminary assessment of the LFG capture and use project were obtained from the PASA and collected during an EPA site visit in August 2010.

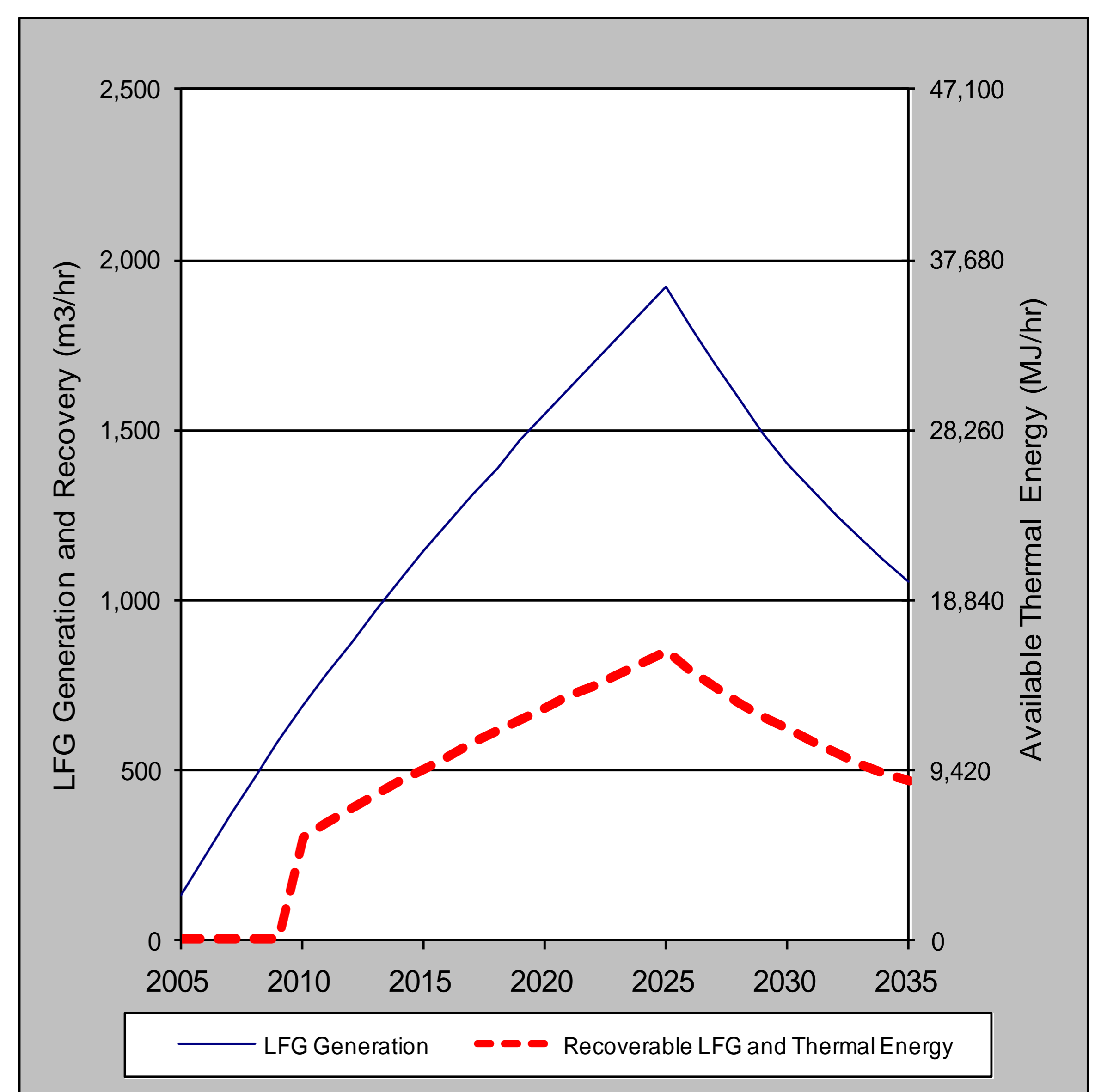
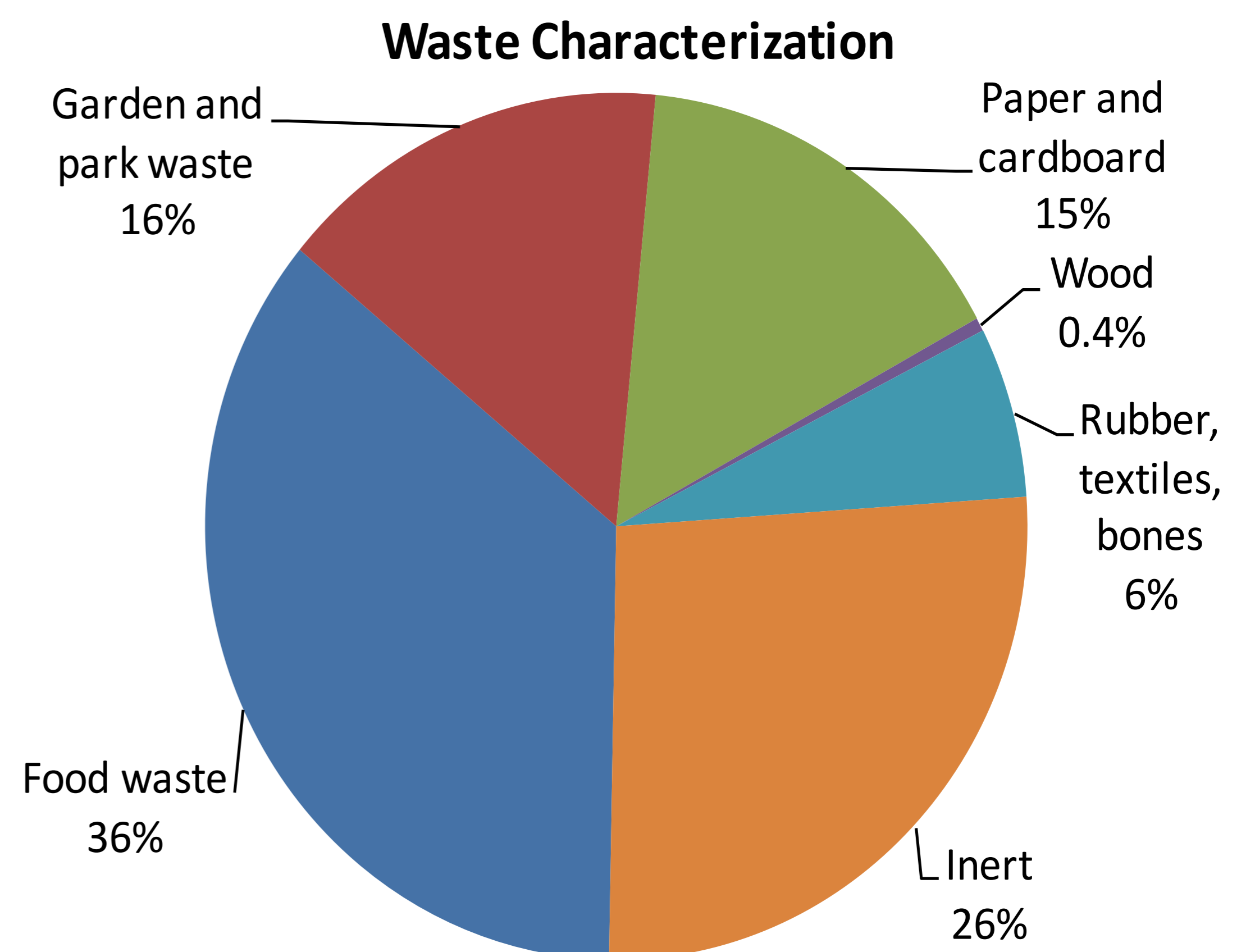
## Other Landfill Physical/Operational Data

- Estimated annual MSW acceptance rates for 2004 to 2024: ranges from 129,300 to 192,300 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):  
69 m<sup>3</sup>/Mg for very fast-decay organic waste  
149 m<sup>3</sup>/Mg for moderately-fast decay organic waste  
214 m<sup>3</sup>/Mg for moderately-slow decay organic waste  
202 m<sup>3</sup>/Mg for slow-decay organic waste
- CH<sub>4</sub> generation rate constant (k):  
0.10 for fast-decay organic waste  
0.050 for medium-fast decay organic waste  
0.020 for medium-slow decay organic waste  
0.010 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 Ojos Negros 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 49% Gas Collection Efficiency = 44%**

## 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 2.9 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	30,628	33,124	35,559	37,938	40,268	42,555	44,804	47,022	49,215	51,386	53,539	55,679	52,169

## FOR MORE INFORMATION

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