

MSW LFG ENERGY PROJECT SUCCESS STORY

İSTAÇ KÖMÜRCÜODA SANITARY LANDFILL KÖMÜRCÜODA VILLAGE, ISTANBUL, TURKEY

PROJECT OWNER: ORTADOĞU ENERJİ

OVERVIEW OF LFG ENERGY PROJECT

In 2009, Ortadoğu Enerji developed, designed, and installed an LFG energy project at the İSTAÇ Kömürcüoda Sanitary Landfill that is owned by İSTAÇ, a municipality-owned company that services the City of Istanbul. Ortadoğu Enerji utilizes more than 150 LFG vertical wells to collect approximately 4,500 cubic meters per hour of LFG to generate 8.4 megawatts (MW) of energy. A total of six (6) Jenbacher engine/generator sets (1.4 MW each) are operating and an additional four (4) more engines will be installed to increase electricity generation to 14 MW. A membrane LFG storage device to assist in regulating LFG delivery pressure to the engines, designed by ECO Membrane, can store up to 16,000 cubic meters of LFG. HAASE designed the booster and flare station. The entire LFG collection system was constructed by Ortadoğu Enerji staff. Electricity transmission lines, transformers, etc. were designed and implemented by Turkish companies.

This project is located at the İSTAÇ Kömürcüoda Sanitary Landfill, the primary waste repository for the Asian side of Istanbul. The 48-hectare landfill opened in 1995. With an additional 90 hectares of space, the Landfill is planned for closure after 2030. The site receives approximately 5,000 tons of waste per day and there is currently 19 million tonnes of waste in place at the Landfill. The Landfill incorporates a liner system and leachate collection system.

Ortadoğu Enerji used a GMI LFG model to assess the project. Representatives of GMI have visited the successful project.

ESTIMATED PROJECT LIFETIME EMISSION REDUCTIONS: 5.95 MMTCO₂E



ENVIRONMENTAL BENEFITS

From 2009 to 2012, this LFG energy project has already destroyed approximately 53.5 million cubic meters of methane. There is the opportunity to destroy an average of 26.2 million cubic meters of methane annually over the next 13 years. This is equivalent to emission reductions of more than 5.95 million tonnes of CO₂eq over the project lifetime.

Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Tonnes CO ₂ eq from LFG Energy Project	395,588	395,588	395,588	395,588	395,588	395,588	395,588	395,588	395,588	395,588	395,588	395,588	395,588	395,588	395,588

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 GENERATION

Ortadoğu Enerji estimated the amount of LFG generated by the İSTAÇ Kömürcüoda Sanitary Landfill using a GMI LFG model. The entire LFG collection system was designed and constructed by Ortadoğu Enerji staff; therefore, significant in-country knowledge has been gained while working on the project. Seventy percent of the project was funded by the Development Bank of Turkey (TKB) (<http://english.kalkinma.com.tr>), Yapi Kredi Bank, and Nordbank. Additionally, the project received a VAT exemption for local and international purchases related to renewable energy. There is a green tariff in Turkey with a rate of US\$0.13/kWh (approximately 100 €/MWh) for LFG energy projects.

LFG Collection System and Energy Project:

- Number of vertical LFG wells: more than 150
- Current average flow of LFG: 4,500 m³/hr
- Percent methane in LFG: 55%
- Engines operating: Currently 6 Jenbacher engines(1.4 MW each) and will add 4 more
- Current electricity generation: 8.4 MW
- Future electricity generation: 14.2 MW
- Future greenhouse project and sludge drying to utilize waste heat is planned for 2013



LFG Wellfield



Closed Portion of the Landfill



LFG Energy Plant

PROJECT ECONOMICS

- **Estimated cost:** €14.21 Million
- **Estimated operation & maintenance cost:** €46.32/MWh
- **Electricity sales:** Electricity is sold for 100€/MWh (this is the green tariff rate in Turkey for LFG energy projects)
- **Other revenue streams:** Expecting to receive carbon credits using the Gold Standard in 2013.
- **Other project incentives:** The project received a VAT exemption for local and international purchases.
- **Estimated payback period (number of years):** 8-10

FOR MORE INFORMATION

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