# MSW LFG ENERGY PROJECT SUCCESS STORY

## ISTAÇ ODAYERI SANITARY LANDFILL
## ODAYERI VILLAGE - EYÜP, ISTANBUL, TURKEY
## PROJECT OWNER: ORTADOĞU ENERJI

## OVERVIEW OF LFG ENERGY PROJECT

In 2008, Ortadoğu Enerji developed and installed an LFG energy project that went online at the ISTAÇ Odayeri Sanitary Landfill that is owned by ISTAÇ, a municipality-owned company that services the City of Istanbul. Ortadoğu Enerji utilizes over 200 LFG vertical wells to collect approximately 10,800 cubic meters per hour of LFG to generate 23 megawatts (MW) of energy. A total of 15 Jenbacher engine/generator sets and three MWM engine/generator sets (approximately 1.4 MW each) are operating and an additional two engines will be installed in 2013 to increase electricity generation to 28.3 MW. Two membrane LFG storage devices (each 16,000 cubic meters in size) to assist in regulating LFG delivery pressure to the engines were designed by ECO Membrane. 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 ISTAÇ Odayeri Sanitary Landfill, the primary waste repository for the European side of Istanbul. The 74-hectare landfill opened in 1996 and is planned for an expansion of another 100 hectares. The site receives approximately 10,000 tonnes waste per day and there is currently 41 million tonnes of waste in place at the Landfill. The Landfill incorporates a liner system and leachate collection and treatment system that uses ultrafiltration and reverse osmosis.

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

## ESTIMATED PROJECT LIFETIME EMISSION REDUCTIONS: 11.6 MMTCO$_2$E


*Map taken from Google Maps*

## ENVIRONMENTAL BENEFITS

From the end of 2008 to 2012, this LFG energy project has already destroyed approximately 94.6 million cubic meters of methane. There is the opportunity to destroy an average of 52.1 million cubic meters of methane annually over the next 13 years. This is equivalent to emission reductions of more than 11.6 million tonnes of $CO_2$eq 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 | 714,233 | 791,175 | 791,175 | 791,175 | 791,175 | 791,175 | 791,175 | 791,175 | 791,175 | 791,175 | 791,175 | 791,175 | 791,175 | 791,175 | 791,175 |

*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 ISTAÇ Odayeri 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$0.133/kWh (approximately 100 €/MWh) for biomass that includes LFG.

## LFG Collection System and Energy Project:

- **Number of vertical LFG wells: more than 200**
- **Current average flow of LFG: 10,800 $m^3$/hr**
- **Percent methane in LFG: 55%**
- **Engines operating: Currently 15 Jenbacher Engines and 3 MWM Engines (approximately 1.4 MW each) and will add 2 more in 2013**
- **Electricity generation: 23 MW**
- **Future electricity generation: 28.3 MW**
- **In 2013, the Landfill will produce additional electricity from the waste heat of the engines using an organic rankine cycle.**

Aerial View of Landfill

LFG Energy Plant

# PROJECT ECONOMICS

- *Estimated cost:* *€26.19* Million
- *Estimated operation & maintenance cost:* €44.21/MWh
- *Electricity sales:* Electricity is sold for 100€/MWh (this is the green tariff value in Turkey for biomass that includes LFG).
- *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):* 6-8

# FOR MORE INFORMATION


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