



## TURKEY: STATE OF THE ART WASTE MANAGEMENT



Combustion of landfill gas produces 35,000 MWh of electricity

New jobs provide a stable income for local people



### KEY FACTS

Waste management is one of the most pressing environmental problems in newly industrialized countries. Even when the appropriate infrastructure is in place, waste managers often struggle to meet the needs of growing urban areas. In the last fifty years, Turkey's population has tripled. Combined with increased urbanization, Turkey has seen rapid growth of major cities such as Istanbul and Ankara. In Turkey today, it is still common practice to dispose of unprocessed waste in landfills. This represents a serious threat to human health and the local environment. In addition, the landfills emit large amounts of methane, which is a potent greenhouse gas.

### The Project

Located around 100 km east of Istanbul, the Kocaeli landfill is the largest in the province. It has an accumulated waste storage of roughly 3 million tons and receives approximately 630 tons of new waste per day. The primary component of this project is the collection of landfill gas, which is then combusted in engines and thereby used for the production of electricity. The site supplies around 35,000 MWh per year to the regional grid and at the same time transforms methane into carbon dioxide - a much less potent greenhouse gas. Prior to the implementation of this project, landfill gas escaped to the atmosphere without any collection, flaring or utilization

### Sustainability Benefits

This project shows how carbon finance can spur cleaner energy projects which reduce emissions while dealing with waste management issues in a sustainable way.

- **Environment:** Beyond the reduction of greenhouse gases, the project contributes to reducing air pollutants associated with the burning of fossil fuels in conventional power plants and it reduces odors. The project also conducted awareness campaigns within the wider community regarding waste management and recycling issues local air pollution. Furthermore, the project reduces local water pollution by reducing the overall amount of water seeping through the landfill body and by collecting the remaining landfill leachate for further treatment.
- **Employment:** New job opportunities were created for the construction and operation of the facilities. Former waste scavengers found employment, providing them with a stable income
- **Social:** The Kocaeli LFG project has provided support to the local Solaklar Primary School for renovations

#### Location:

Kocaeli Province, Turkey

#### Project type:

Landfill Gas

#### Project standard:

Gold Standard

#### Total emission reductions:

»» 635,000 t CO<sub>2</sub> e p.a. ««

#### Project start date:

March 2011

#### Project partner:

Korfez Enerji A.S.

#### Validator:

TÜV Rheinland

#### Verifier:

TÜV Rheinland





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### Technology brief - how it works

Landfill gas consists mainly of methane and carbon dioxide. The gas is a by-product of anaerobic decomposition of organic material. Even after they've closed, landfills can emit methane for decades. Left untreated, landfill gas slowly escapes to the atmosphere, and contributes substantially to climate change. Methane as the primary landfill gas has 21 times the climate impact of carbon dioxide. As a result, landfill gas projects contribute to climate change mitigation by both reducing methane and other greenhouse gas emissions, and simultaneously displacing the equivalent amount of electricity produced by a nearby power plant.

To capture the gas, the landfill or single compartments are covered with foil. A system of pipes is used to collect the gas within the landfill body. The gas is usually actively extracted by creating a vacuum, and collected in central wells. By combusting the gas in a flare, methane is converted into carbon dioxide. If the gas is combusted in an engine the energy contained in it can be used to generate electricity.



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