

Brazil: Electricity from landfill gas

Sustainable power generation from landfills in Uberlândia



Certification:
United Nations Framework Convention on Climate Change

Key Facts



Background

Landfills are a widespread method of municipal solid waste (MSW) disposal in Brazil. Whilst organic materials within the waste decay in the absence of oxygen, landfill gas is being produced as a by-product. If the gas is not being collected and destroyed, it rises into the atmosphere. Since they contain a high proportion of methane, a very potent greenhouse gas with a high degree of warming potential, landfill gas emissions put strain on global climate.

Installing a gas collection, utilization and/or destruction system at a landfill site can help to prevent methane emissions. In many cases these systems are combined with an electricity generation facility that allows for the energy contained in methane to be harnessed.



The Project

The Uberlândia landfill gas project involves two neighbouring landfill sites for solid waste in the Brazilian state of Minas Gerais. The project aims to generate environmentally-friendly electricity from the gases that are created through the decay of organic waste. The project has a total installed capacity of 2,852 MW and, over its lifetime, the project will generate around 420,000 MWh of clean electricity from around 2.5 million tonnes of waste. Based on average per capita electricity consumption, this is enough to sustainably supply power to 170,000 Brazilians for a year.

The collection and utilization of the landfill gas is also good for fighting against climate change, as methane has a particularly strong impact on global warming and would have otherwise have continued to be released into the atmosphere. The landfills are operated in compliance with the strictest environmental regulations and the project operators have previously received an award from the state environmental authority as the best landfill in Minas Gerais.

Location:
Uberlândia, Minas Gerais, Brazil

Project type:
Landfill Gas

Total emission reductions:
» 700,000t CO₂e p.a. «

Project standard:
CDM & Gold Standard

Project start date:
September 2012

Sustainable Development

By supporting this project you'll contribute to the following Sustainable Development Goals:



SUSTAINABLE DEVELOPMENT GOALS

While focusing on reducing greenhouse gas emissions, all our projects also generate multiple co-benefits. These are supportive of the United Nations Sustainable Development Goals.



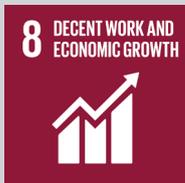
Good health and well-being

Landfill gas doesn't just have a negative impact on the climate. If enough of it collects within a landfill, there is a danger of explosion which is a risk to those who work and live nearby. By collecting and destroying the gas, the project prevents this danger. The project also reduces unpleasant odours.



Affordable and clean energy

By utilising the gas from organic waste, the project promotes the production of cheaper and cleaner electricity.



Decent work and economic growth

The project provides local jobs in maintenance and operation of the control system. The operation creates employment for engineers, technicians, administrators, accountants, procurement officers, and others.



Industry, innovation and infrastructure

The project acts as a lighthouse project, providing a good example of a modern, environmentally friendly and efficient waste management system that also contributes to climate protection.



Climate action

Due to its high amount of methane, landfill gas is a very potent greenhouse gas. By utilising this gas for energy, the methane is almost entirely destroyed. As a result, the project annually avoids the emissions of around 77,000 tonnes of CO₂e every year.



Life on land

The electricity generated is fed into the Brazilian transmission network, reducing reliance on electricity from conventional power plants. This reduces the emission of air pollutants such as nitrogen oxides and sulfur dioxide, which would result from burning fossil fuels.



Technology brief – how it works

Landfill gas consists mainly of methane and CO₂. Methane is created through the process of anaerobic digestion, whereby microorganisms break down biodegradable materials in oxygen-free conditions. The higher the fraction of organic material in the waste, the more gas is generated. In developing countries without waste sorting, waste can contain up to 75% organic matter. Without capturing equipment, landfill gas slowly escapes to the atmosphere through cracks and holes contributing to global warming.

The warming potential of one tonne of methane is equivalent to 21 tonnes of CO₂. The LFG collection system includes the installation of a horizontal collection system in the form of trenches and vertical wells to avoid methane emissions. The collection system is connected to the transmission pipeline transporting the collected LFG to the power generators. The leftover gas in excess of that needed for fuel is then taken to the flare station where the methane content of LFG gas is being destroyed.



Project Standard



The CDM is one of the three Flexible Mechanisms defined in the Kyoto Protocol and allows emission-reduction projects in developing countries to earn certified emission reduction (CER) credits, each equivalent to one tonne of CO₂.

These CERs can be traded and sold, and used by industrialized countries to meet a part of their emission reduction targets under the Kyoto Protocol.



The Gold Standard is an award winning certification standard for results based project finance and is recognised internationally as the benchmark for quality and rigour in certifying environmental and socio-economic project outputs.

Established in 2003 by the World Wide Fund For Nature (WWF), the Gold Standard today is trusted and endorsed by NGOs, governments and multinationals including United Nations agencies worldwide.

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