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BRAZIL: MANAUS LANDFILL GAS PROJECT

MORE THAN 60.000 TONS OF WASTE ARE DISPOSED OF EVERY DAY

COLLECTING LANDFILL GAS CAN HELP MAKE THIS MORE SUSTAINABLE

Brazil is expected to become one of the world's largest economies by 2050, and coupled with a steady growth in its population, currently at 190 million inhabitants, consumption and the production of waste are expected to rise dramatically. It is estimated that around 60.000 tons of waste are disposed of at 6.000 different waste sites every day, three quarters of it dumped without sorting or management. Most of these sites also lack gas collection and water treatment.

Located at the Manaus Landfill, 3.5 km north of the city of Manaus, the project is implemented in two stages; first, the construction of a landfill gas (LFG) collection and flaring system and second, the construction of a LFG-fired power plant. The power plant includes twelve LFG fuelled power generators with an aggregated installed capacity of approximately 19.2 megawatts. The electricity generated is supplied to the Manaus Electricity Grid.

Without revenues from carbon finance, the project would never have been viable as the projected income from electricity tariffs, capital and operational expenses has been deemed financially unattractive by developers. The innovative nature of the project and its prospects for revenue serve as a showcase in the area for other municipalities to adopt and implement similar practices, contributing to broad sustainable development goals in the region.

SUSTAINABILITY BENEFITS

This project reduces greenhouse gas emissions and improves local environmental conditions through the reduction of odors and ground water contamination. It minimizes the fire hazard at the landfill site through the removal of methane and displaces fossil fuel generated electricity including the negative environmental impacts associated with it.

The project offers employment positions for local community members during the construction and operational phases of the project. Sharing carbon revenues with the municipality of Manaus throughout its crediting period, the project contributes further to local income generation.

Manaus is located in the heart of the Brazilian Amazon and its grid is not connected to the National Electric Grid of Brazil. Therefore, feeding it with new, renewable electricity improves supply in a rather energy-isolated region and contributes to regional integration.

KEY FACTS

Location:
State of Amazonas, Brazil

Project type:
Renewable Energy – Landfill Gas

Project standard:
VCS (pre-CDM)

Total emission reductions:
>> 1.032.000 t CO_2 e p.a. <<

Project start date:
July 2008

Project partner:
TUMPEX – Empresa Amazonense de Coleta de Lixo Ltda.

Validator:
SGS (DOE)

Verifier:
Det Norkse Veritas (DOE)

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TECHNOLOGY BRIEF - HOW IT WORKS

Landfill gas consists mainly of methane and CO_2. 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 damaging effect of one ton of methane is equivalent to 21 tons of CO_2.

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 destroyed.

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