

ECO METHANE

Integrated CH₄ solutions



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Marca

Landfill Gas-to-Energy Project

Brazil

Pricing Confidential

*Placement of Certified Emission
Reductions representing 140,000 tCO₂
Purchase Identity Confidential*

ECO SECURITIES

Acted as Carbon Advisor to the Seller

Marca Constructora e Serviços Ltda.

June 2005

MARCA Landfill Gas to Energy Project

Case Study



MARCA Landfill Gas to Energy Project in Cariacica, Espirito Santo State, Brazil



Project description

- The project is being developed by EcoMethane who has invested, designed, constructed, installed and currently operating the LFG collection and flaring systems. In addition, EcoMethane developed the project under the Clean Development Mechanism of the Kyoto Protocol and placed the carbon credits in the marketplace. When a suitable power purchase agreement is in place, EcoMethane will install and operate the equipment necessary to generate electricity.

Benefits

- **Economic.** Royalties are paid to landfill owner/operator.
- **Technological.** The project acts as a clean technology demonstration project, encouraging less dependency on grid-supplied electricity and better management of landfills throughout Brazil, which could be replicated across the region
- **Environmental.** Local and global benefits from reduced harmful emissions, as well ensuring safety on the landfill site
- **Social.** Reduction of odours from methane emission and improved health to local communities

Emission reductions

- 2.1 million tonnes of CO₂e over the next 21 years.



MARCA Landfill Gas to Energy Project



EcoMethane provided an integrated one-stop solution to the MARCA project through its joint venture partner companies:

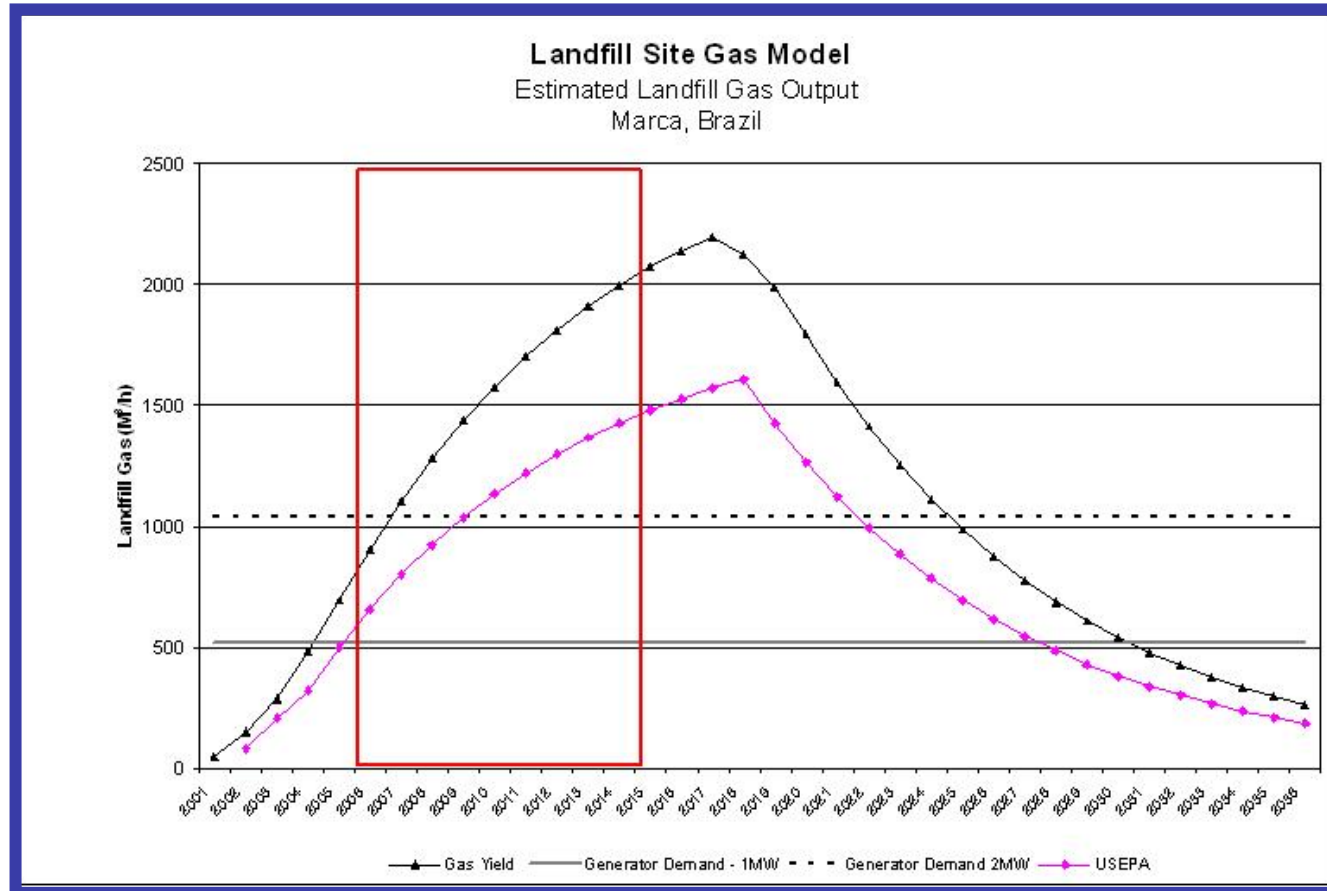


- **Biogas Technology Ltd.** provided the technological solution by investing, designing and constructing the project.
- **Biogas Technology do Brasil Ltda.** was established as a local company to operate the project, ensuring the adequate on-site operation and maintenance of the landfill gas collection and flaring system.
- **EcoSecurities Ltd.** Developed the project under the CDM, including preparing documentation, registering the project, and placing the carbon credits in the marketplace.

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Landfill gas production curve (m³/hour)



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Landfill before the implementation of a landfill gas capture and utilisation system



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Landfill operator covering the site with soil



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Installation of the landfill gas collection system



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Manifold valves for balancing the landfill gas collection system



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Installation of the flare system and instrumentation

- Proper instrumentation, protocols, and interface with the flare are key to ensuring that emission reductions are verifiable by third parties



Flare system



Flare system



Instrumentation



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Landfill gas flare system installed



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Landfill gas collection and flaring system started operation in July 2005



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In a second stage, the landfill gas collected will be used for generating electricity to be exported to the local grid. This is an example of a LFG electricity generator that would be installed at the site.