



Durban (eThekweni) Landfill



Project Summary

- Type:** Landfill
- Size:** 10MW of electricity fuelled by a methane rich landfill gas from three landfill sites.
- Ownership:** eThekweni Municipality (Durban).
Development by the Department of Cleansing and Solid Waste (DSW) of eThekweni Municipality.

Background:

The Durban (eThekweni) municipality plans to generate electricity from rubbish, at the same time reducing greenhouse gas emissions.

The project will capture methane rich landfill gas from three landfill sites to provide fuel for the production of 10 MW of electricity. The gas is captured by sinking wells up to 40m deep in the landfill waste sites and through inter-connecting pipes linked to an underground main gas collector and extracted via a roots blower system which maintains a partial vacuum in the pipes resulting in the gas being sucked out of the landfill. Presently a small portion of this gas is flared, or burnt off whilst most of the gas is vented to the atmosphere as harmful green house gas thus contributing to global warming.

Plant Description:

This project comprises two complementary components as follows:

- Extraction, collection and flaring of methane from three landfill sites and;
- Generation and supply of electricity to the municipal grid.

The three sites are:

- La Mercy located at 35 km north of Durban.
- Bisasar Road some 7 km from the Durban CBD (Central Business District) and;
- Mariannahill located in the western area of the Durban Unicity around 20 km to the west of Durban in the Metro area formerly called the Inner West City Council (IWCC).

Moderate speed (1500 rpm) spark ignition engine generators will be installed at the three sites to generate electricity for despatch into the local grid network.

Financial Aspects:

Income will come from two sources. Firstly by selling electricity generated from methane under a long-term power purchase agreement (PPA) to Durban (eThekweni) municipality and secondly by selling its reduction in CO₂ emissions under a Emissions Reduction Purchase Agreement (ERPA) with the World Bank administered Prototype Carbon Fund as Certified Emission Reductions (CER).

Project Progress:

- Technical, environmental and feasibility assessments completed.
- Agreements and Environmental Impact Assessments (EIA) completed for all three sites.
- Application for "host country" approval by the Designated National Authority (DNA) is proceeding.
- Prototype Carbon Fund approval given, Emission Reduction Purchases Agreement signed
- Electricity sale agreement. Agreed by the Council's Executive Committee (EXCO) as it is an internal transaction.
- Construction to proceed as soon as the DNA's letter of approval is obtained.

Stage in Process:



Focus Area: Financial

Background to Project Viability:

Two contracts drive the income for the project. One between eThekweni Cleansing and Solid Waste department and eThekweni Electricity department for the sale and purchase of electricity the other is the emissions reduction purchase agreement entered into between eThekweni Municipality and the World Bank administered Prototype Carbon Fund (PCF). The PCF is essentially a public private partnership agreement whereby several national governments and companies worldwide have contributed to a carbon finance fund.

Financial Summary:

- **Projected Capital Cost: R 106.8 million**
- **Internal Rate of Return: 16%**
- **Power Purchase Tariff: R 0.13/kWh**
- **Annual Power sales (estimated): R 8 million**
- **Annual income from CO₂ emission reductions: (averaged) R 9.5 million**

Investment:

Financing has been secured through normal Municipal budgeting arrangements by the Cleansing and Solid Waste department of eThekweni Municipality. Various loan options have been investigated, as well as possibilities for future privatisation or private sector equity stakes in the project.

Operations:

The project has two components - Component One, covering the Mariannahill and La Mercy landfills, will generate 700,000 tons of emission reductions. Component Two, the Bisasar Road Landfill, will generate 3.1 million tons of emission reductions. The Prototype Carbon Fund will purchase 3.8 million tons of greenhouse gas emission reductions from the project at a price of US\$3.75 per ton of carbon dioxide equivalent. This provides 55% of the income from the project.

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Sponsor Details / Conditions:

The project will benefit from the Clean Development Mechanism of the Kyoto Protocol, the 1997 international agreement to limit the emissions of climate altering greenhouse gases. Under the provisions of the agreement with the World Bank an additional US\$ 0.20 per ton of carbon dioxide equivalent will be paid for additional social benefits aimed at poverty reduction and addressing the needs of poor and disadvantaged people in eThekweni. These payments, from a US\$760,000 (R 4.75 million) social benefits fund, are conditional upon approval of the design and implementation of the social implementation plan by the World Bank and the commissioning of Component Two of the project.



The social benefits trust fund payments will be spent in accordance with annual work programmes approved by the trust's administrators or trustees and the World Bank as trustee for the Prototype Carbon Fund. Eligible work programmes include waste management and recycling programmes that benefit poorer residents; or vocational training, education and skill enhancement for poorer residents of the eThekweni Municipality.

This case study is one of a number in this series.

Each case study has a specific focus from one of four different perspectives namely: - Ownership, Financial, Environmental and Market Potential / Network Access.

Further details can be obtained from Brett Dawson at the DME Tel: +27 12 317 8468

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