

eThekwini Municipality: landfill gas to electricity

What	eThekwini Municipality waste to electricity landfill gas CDM project
Where	Durban, KwaZulu-Natal
Who	eThekwini Municipality
Why	To extract methane from 3 council-owned landfill sites (Mariannhill, La Mercy and Bisasar Road) for electricity generation and sale and in turn substantially reduce greenhouse gas emissions emitted from the landfill sites
When	Commissioning between late 2006 and mid-2009
Funding	Initial funding - World Bank's Prototype Carbon Fund Income - Sale of CERs and electricity



eThekwini launched Africa's first landfill gas to electricity project in 2007. It involved the extraction of methane from three council-owned landfill sites (Mariannhill, La Mercy and Bisasar Road) for electricity generation. Methane is a greenhouse gas 25 times more potent than carbon dioxide (CO₂). Landfill site emissions were

reduced through flaring, where methane is burnt to produce relatively less damaging (CO₂), and through methane-powered electricity generators, which reduces conventional coal-fired electricity use. The project was registered with the Clean Development Mechanism (CDM) and generates income from 1) the sale of Certified Emissions Reductions (CERs) to the World Bank, and 2) the sale of electricity generated.

The project demonstrated the importance of having a guaranteed CER buyer in place. Project drivers included the city's Electricity Department and, importantly, a champion in the city's Cleansing and Solid Waste Department. Good internal communication and buy-in

at the highest level (the mayor was directly involved) was a key factor in getting the project implemented. Electricity generation capacity of 0.5MW, 1MW and 6.5MW was installed at La Mercy, Mariannhill and Bisasar respectively. La Mercy was later abandoned because the gas generated was not adequate despite initial pumping trial indications. Bisasar, the busiest landfill in Africa, exceeded all expectations.

Overall, the project had an estimated payback period of 4 years. It became clear that small landfills (less than 1 000 tonnes of waste per day) are not viable for electricity generation, unless a Renewable Energy Feed-In Tariff is introduced. Landfills that accept more than 3 000 tonnes per day can have a payback period of six years or less, but only if the sale of CERs is included. Currently 50 000 MWh is generated per year, enough to power 3 750 small houses, and CO₂ emissions are reduced by 20 000 tonnes per month.

