

RENEWABLE ENERGY BEST PRACTICE CASE STUDY
IRISH ENERGY CENTRE, RENEWABLE ENERGY INFORMATION OFFICE

LANDFILL GAS UTILISATION PROJECT, DUBLIN

Site: Dunsink, County Dublin

Starting-up date: 1996

1. AIM OF THE PROJECT

The aim of the project is to use landfill gas to generate electricity and by doing so convert a potential environmental liability into a valuable resource.

2. DESCRIPTION

The Dunsink landfill site, located in north Dublin, contains some 5 million tonnes of waste. Gas is recovered from the site and burned to provide 4.8 MW electricity generating capacity.

The gas collection system consists of 7 km of piping, which encircles the site and runs off to 120 individual wells from which the gas is drawn. Each well is drilled to a depth of 20 metres and contains a slotted pipe, 90 millimetres in diameter into which the gas migrates. The vertical pipes are surrounded by gravel to filter out particulate matter. The pipes run back to 11 manifold or gas collection points, which contain infrared gas analysers that provide a breakdown of the landfill gas constituents.

Gas from the collection system is pumped back to 4 turbo-charged, inter cooled spark ignition engines. Each engine is directly coupled to a four pole generator running at 1,500 rpm, synchronising at 380 V, stepping up to 10 KV or 38 KV and feeding directly into the network.

3. OWNER

The project is owned by Wimpey-EPC Ltd., a joint venture between the UK engineering company George Wimpey Group and Electric Power Controllers, which is owned by 3 Irish investors.

4. INVESTMENT AND FINANCING

The total investment costs for the plant were in the region of IR£3.5 million. This was raised through partnership funding. Annual operating costs are estimated at IR£850,000.

Revenue is generated through electricity sales at an average rate of IR£0.042. (This rate is linked to the Irish consumer price index until 31 December, 2010.)

A pay-back period of 5 years has been estimated for the plant.

5. RESULTS (ENERGY DETAILS)

The landfill site yields 3,000 cubic metres of landfill gas per hour. The electricity generating plant has a capacity of 4.8 MW and since it was commissioned has recorded an average of between 97 and 99 percent uptime.

6. ENVIRONMENTAL IMPACT

Landfill gas is odorous, explosive and unhealthy to the immediate environment. In addition, its constituents are major greenhouse gases.

The energy plant removes 3,000 m³ of landfill gas from the environment every hour. Moreover, by generating useful energy it, displaces the need to burn fossil fuels.

7. USERS

The state utility, ESB, purchases electricity produced by the plant. There is also potential for heat to be recovered from the exhaust gases and used to meet the requirements of, for example, a local laundry or a community-based heating system. Wimpey-EPC is currently seeking such a user for this heat.

8. MAIN MANUFACTURERS AND SERVICE SUPPLIERS

Overall Design and Management

Wimpey - EPC Limited, Dunsink Power Station, Dunsink Lane, Finglas, Dublin 15.

Tel +353 1 8221050 Fax +353 1 8221049

Gas Network

B&M, 16 Dock Row South, Bromborough, Wirral, England L62 4SQ.

Tel +44 151 3340122 Fax +44 151 3345060.

Engine Package

Dale Power, Electricity Building, Filey, North Yorkshire, England YO14 9PJ.

Tel +44 1723 514141 Fax +44 1723 515723

Gas Pumps

Fans and Blowers, Walrow Industrial Estate, Commerce Way, Highbridge, Somerset, England TA9 4AG.

Tel +44 1278 784004 Fax +44 1278 786910

9. MORE INFORMATION

Wimpey - EPC Ltd, Dublin.

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- Landfill Gas Utilisation Project, Dublin
- Restoration of Cahir Mills
- Kenmare Hydropower Station
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