

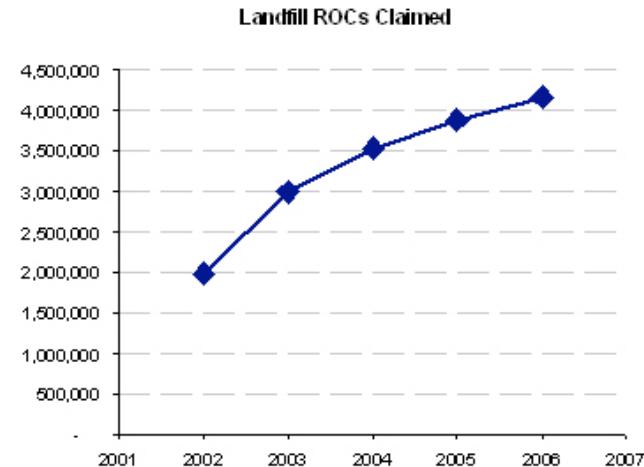
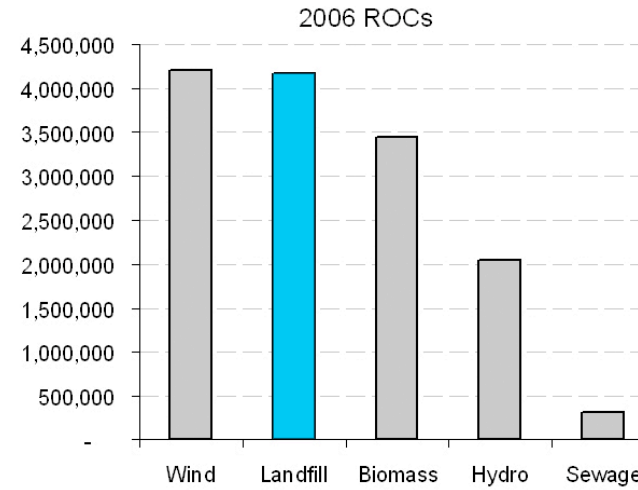
Renewable Energy Foundation
Renewable Energy Data
Technology Analyses:
Apr. 2002 – Jan. 2007
Landfill Gas

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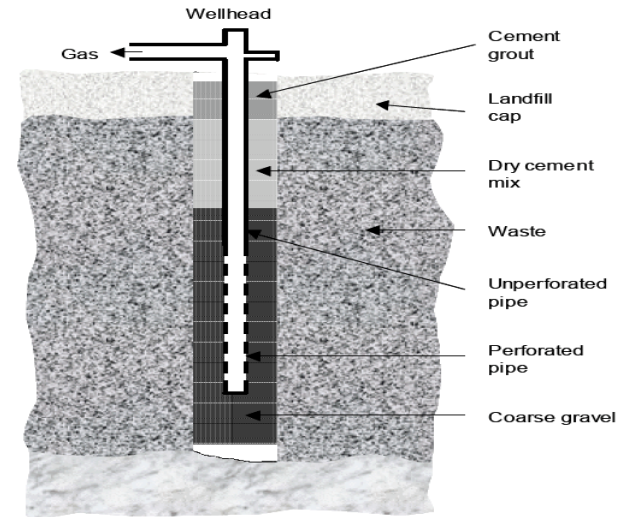
Landfill Gas Contribution Since 2002

- Landfill Gas produced the second largest number of ROCs in 2006, 4.2 million.
 - 30% of total ROCs claimed.
 - Landfill Gas ROCs have increased by 40% since the first full year of the RO in 2003.
- The *Energy White Paper 2007* declared the government's intent that from 1st April 2009, landfill gas will be banded such that operators receive reduced support at 0.25 ROC/ MWh. Existing stations to continue at 1 ROC per MWh



Landfill technology

- In landfill sites, Municipal Solid Waste (MSW) is deposited in cells lined with clay or some similar impermeable material which limits the ingress of air. As the waste breaks down with the on-set of anaerobic conditions, gases, including methane, are produced. These can be captured and fed to reciprocating engines to generate electricity.
- Wells are drilled into the waste and slotted pipework is inserted. A light suction is applied to draw out the gas from the waste.
- Due to the variability of waste input, a gas clean up system must be incorporated to eliminate low levels of contaminant gases.
- Under optimum conditions one tonne of waste will produce 150 to 200 cubic metres of gas.³
- Undiluted landfill gas can be expected to have a calorific value of 15 to 21 MJ/m³.

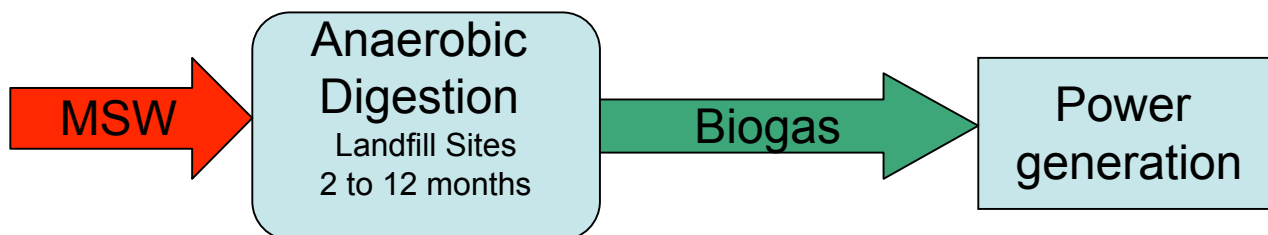


Fuels	Methane (%)	45 - 65
	Hydrogen (%)	0 - 1
Diluents	Carbon dioxide (%)	34-55
	Nitrogen (%)	0-20
	Oxygen (%)	0-5
Contaminants	Hydrogen sulphide (ppm)	0.5 - 100
	Ammonia (ppm)	Trace amounts

Biogas Constituents from Landfill²



Operational summary



Welbeck Landfill Site, Wakefield ¹



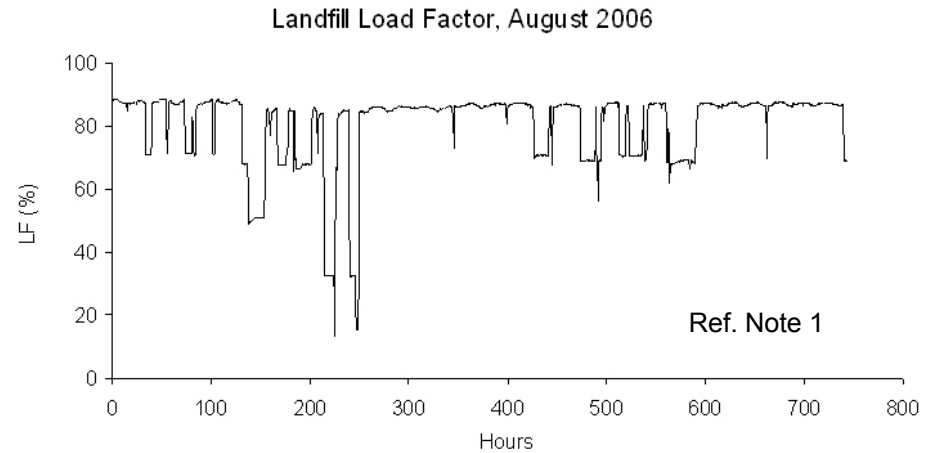
Generator at landfill south of Wangford ²

- 357 plants claimed 4.2 million ROCs in 2006 (Data taken from Ofgem ROC records).
- Growth is limited by the trend to reduce the amount of MSW being disposed to landfill.



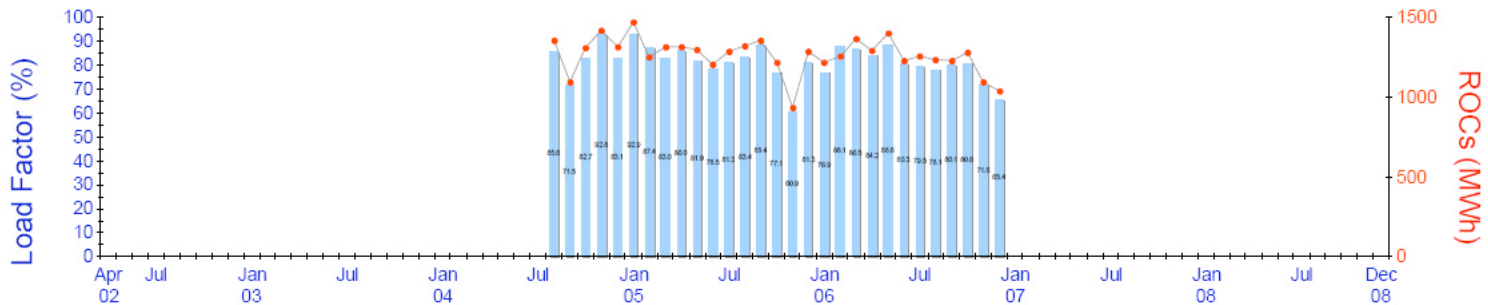
Power output is steady

- Landfill sites run their engines continuously to match near steady production of gas, and power output is near constant:
 - Maintenance occasionally reduces power.
 - Long term output declines as waste breaks down more fully and the landfill becomes depleted.



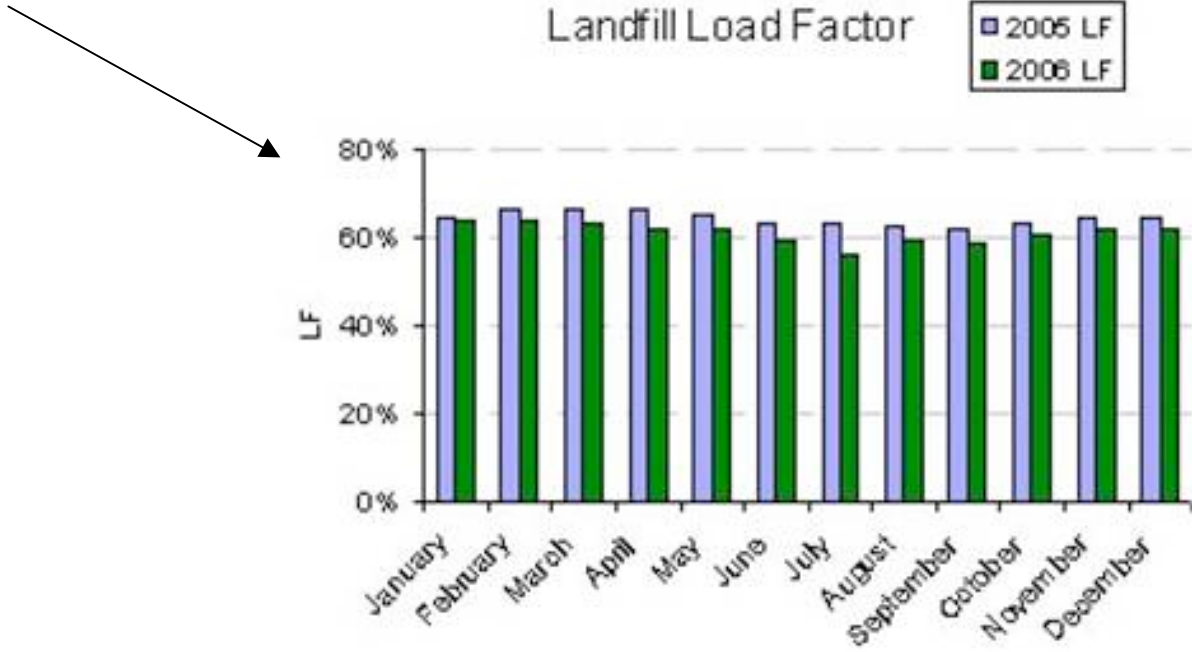
Generating Station Name: Aveley Phase 2 Generation
Technology Type : Landfill gas

R.O. ID R00520RJEN
TIGC (kW) : 2,128



National Load Factor

- The annual national Load Factors for landfill gas:
 - 2005 : 64.3%
 - 2006 : 60.9%



Summary

- Landfill gas is produced by an anaerobic process occurring in impermeable landfill stacks.
- Landfill gas ROCs have increased by 40% since 2003 and provided 30% of all ROCs claimed in 2006.
- The evolution of landfill gas is steady and consequently the generators provide steady base load electrical power hour by hour and month by month.
- The Energy White Paper 2007 reduced banding for Landfill to 0.25 ROC/MWh:
 - Growth in Landfill will be limited in the future due to the trend to reduce the amount of waste going to landfill.

