

A NEW CONCEPT FOR SMALL SCALE LANDFILL GAS PLANTS IN DENMARK

Azhar Shah
Energy and Environmental Office of Viborg
Vognmagervej 14
DK-8800 Viborg
Denmark
Phone: +45 8661 2322
Fax: +45 8661 4146
E-mail: azhar@12mail.dk



There are 22 landfill gas plants in Denmark - the oldest is from 1985. They are established in landfills with 130.000 to 6.000.000 tons of waste. The gas is used for production of electricity by means of gas engines. The engines are of the flash ignition type (Caterpillar and Jenbacher) and have an effect of 30 kilowatt to 3 megawatt. The production of electricity is sold to the public grid. The drillings of the plant is made with drills that are shaped as snails and have a typical diameter of 500 millimetre.

The new concept is used in the smaller landfills, where there are no plants yet. The production of gas in these plants will be 10-50 cubic metre an hour at 45% methane. The front of the drill has a diameter of 130 millimetre. It is forced 6 to 10 metres down in the landfills with a pile driver. Thereafter, perforated plastic pipes, with a diameter of 32 millimetre, are placed in the hole, which the front of the drill leaves, as it is removed. The upper part of the plastic pipes, 2 to 3 metres, are not perforated. The drilling is sealed in depth that matches the upper part of the plastic pipes.

The basic idea of the concept is: smaller drillings and larger coverage of the area because of several drillings.

The gas is transported in 6 bars plastic pipes with a diameter of 40/25 millimetres, that are ploughed in a depth of 20 to 25 centimetres.

The pressure is regulated by means of a manual valve placed at each drilling and at a manifold in the techniques room. The pressure is created by a gas exhauster.



The gas is used for production of electricity, by means of 15-110 kilowatt diesel engines which runs by 10% diesel for ignition and valve cooling and 90% landfill gas.

By using dual-fuel plants you gain:

- s A high degree of utilised electricity, which is particularly important, as it is only the production of electricity, that is utilised.
- A small sensitivity towards changes in the percentage of methane, that often occur in plants with low technology.
- Lower expenses concerning the construction and operation of the engines.

There are now 6 plants with dual-fuel engines (15 to 110 kilowatt) in Denmark. 3 of these are based on remote surveillance in unmanned landfills.