

Deponigas clears away the refuse

The small NGO-firm Deponigas Aps has during the last few years developed a method that makes it economically profitable to use the gas from even very small landfill sites (refuse dumps). To day the firm is running one quarter of the Danish landfill sites from which gas is being used for production of energy.

When you have seen a number of the gas plants, that Deponigas has built in closed waste deposits around the country, you must certainly ask yourself: Why didn't anybody do this a long time ago?

It is simple, it is cheap, and it is above all a very efficient way of reducing the outlet of greenhouse gasses.

In principle a landfill site is in fact one big biogas plant, and by utilizing the gas you kill two birds with one stone – environmentally spoken. The utilization of biogas contributes to a reduction of the use of fossil fuels, but the really big advantage lies in reducing the outlet of biogas from the landfill site, as this greenhouse gas is 20 times worse than CO₂.

This is no news – principally spoken. The new thing is, that Deponigas is able to build plants at entirely different costs than seen before, and therefore is has become economically profitable – even to very small landfill sites – to use the biogas.

23 plants running

The first plant using gas from landfill sites in Denmark was established right back in 1985 in a landfill site at Viborg. Since then plants have been built in additionally 23 sites around the country. Of this Deponigas has establishes 6 plants within the last two years.

Till now it has been a rather costly matter to utilize the gas from landfill sites, and because of this it has especially been landfill sites with big amounts of organic waste, that have utilized the biogas.

This is especially connected to the fact that until a few years ago the market was dominated by larger contractor firms, where considerable amounts of money were spent on calculations by engineers and technically advanced hardware.

Deponigas can by no means be abused of this. The firm, which has been founded on the initiative of The Energy and Environmental Office of Viborg, has an unusually low rate of costs, and so far they have been able to manage with only two employees – each of them performing a number of different tasks. Ole Elmoose works for instance as director, sales manager and unskilled labourer, while Azhar Shah takes care of all technical areas following the gas equipment and the plants for district heating.

Simple technology

But not only expensive engineer calculations have been saved by Deponigas. Their technology is in many ways cheaper, more simple and less vulnerable than the technology of traditional landfill gas plants.

The drills are made in this way:

The front of the drill has a diameter of 150 millimetres. It is forced 8-12 metres down in the landfills with a pile driver. Thereafter, perforated plastic pipes, with a diameter of 50 millimetres, are placed in the hole, which the front of the drill leaves, as it is removed. The upper parts of the plastic pipes, 2 metres, are not perforated. The drilling is sealed in depth that matches the upper part of the plastic pipe.

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

In many landfill plants there have been problems with leaks in the gas pipes because of settling of the landfill. Therefore Deponigas has chosen to place the gas pipes on the ground and at the same time cover them with the bigger leftovers from the composting process of the site. This is an extra production in many landfills sites, which can be difficult to dispose of. In this way the risk of leaks is reduced, and it is cheaper than if you have to dig the pipes into the landfill.

The adjustment of the amount of gas coming from every single drill hole is made manually, and on the whole no big amounts of money are spent on advanced control systems.

Ole Elmoose tells with a big laugh how the remote watching system functions at the first landfill plant at Bjerringbro. Here the system consists of a mobile phone installed in the engine room. At uniform intervals you call up the mobile phone, and if a steady motor sound is heard in the background, this is taken as a sign that the plant functions as it should.

Still remote watching of the running of the motor at 4 newer and bigger plants is carried out from PC in the office of the company through the telephone network. The technology is so sturdy that two of the plants in finished, unmanned landfill sites only are inspected physically 4-6 times a year.

Diesel Oil secures stable operation

Landfill sites are normally placed at a suitable distance from urban areas, so usually it will only be possible to utilize a limited part of the heat production. The crucial source of income must therefore come from sales of electricity, produced by a motor/generator plant.

But it is however not quite without problems to make an ordinary gas engine run steadily in a landfill plant where the percentage of methane often varies between 30 and 50 percent.

To manage this problem Deponigas has chosen to use ordinary diesel engines, running on a mixture of diesel and biogas. The diesel oil is used for ignition and cooling of nozzles while the biogas, accounting for 90 % of the fuel, is mixed with combustion air.

The disadvantage is that you have to spend money on diesel, but this is compensated for by the fact that the engine is cheap in both purchase and running, just as the efficiency of a diesel engine usually is higher than that of a gas engine with ignition.

Cleaning up

In two years Deponigas has established six landfill plants, and in these days the seventh plant is being built at Skodsbøl landfill site by Als Sund in Southern Jutland.

According to Ole Elmoose all plants have been built in landfill sites, which have been of no interest to the established firms. The sites have simply been too small to return a profit.

We have found a niche, so we are by no means in competition with the more established entrepreneurs, Ole Elmoose says.

In other cases we have more or less taken over plants that had been given up. At Sdr. Hostrup there had in this way been established a plant for obtaining biogas, but the firm had given up the project because it would become too expensive to utilize the gas.

At Roskilde there was a complete plant, fully capable of functioning, where the running had been stopped because of too high costs of running and too small an income from the sale of heating.

At both plants we have taken over the running on our own account and risk. We can make the plants profitable by producing electricity, and the owners of the sites have solved an environmental problem because the gas now is being utilized.

Updating:

Since the founding of the company in November 1999 it has established 8 plants with motors running, of which the company owns five. Besides the company has been in charge of the extension of obtaining biogas at one existing plant, and has received environmental authorisation for two further plants.

Deponigas has in the middle of 2004 obtained a total motor running time of more than 60.000 hours and more than 20.000 hours in delivered plants.

The company has up to date been involved in one third of the Danish landfill gas plants.

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