Benefits Of Biogas At Samso

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Biogas

Samso has a relatively large amount of biomass. If all of it is to be exploited, it can only be done by means of a biogas plant.

A central biogas plant converts animal manure and other organic material, including municipal organic waste, into energy. Biogas is CO_2 neutral and therefore renewable energy. There was a biogas plant (at Farmen), but it is no longer in operation.

Biogas potential

Samso has only a small amount of organic industrial waste (Fig. 1). On the other hand the island has a relatively large potential from energy crops in fallow fields and potato tops. Grass, among others, is well suited for a biogas plant.

The largest possible biogas production corresponds to 30% of the energy demand of the entire island (500 TJ per year). The calculation assumes that a central biogas plant produces 35% electric energy, and 50% heat energy; the remainder is for the plant's own consumption and losses.

The revenues from selling heat and electricity would be 1.8 mill EUR per year (28 mill DKK).

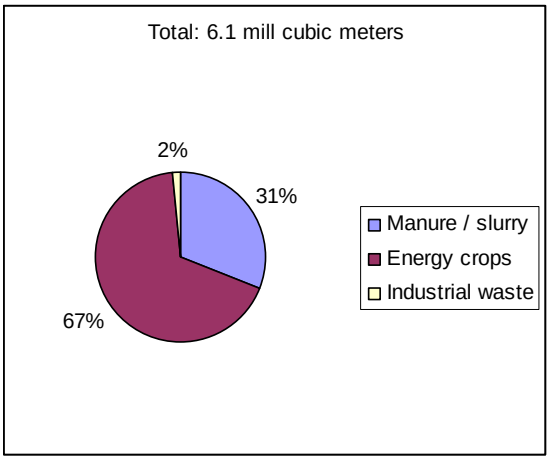

Figure 1. Potential biogas production on Samso (Planenergi 2002).

The model behind the calculation is a deliverable of the BIORES project (biogas model_samso3.xls). Data are from 2002, where a consulting company mapped all animal farms above a certain minimum size. They also calculated the economy of several plant proposals (Planenergi 2002).

There is a biogas plant in Vester Hjermitslev with approximately the same production capacity (Hjort-Gregersen 1999).

With the 2008 energy agreement in parliament, the selling price of electricity is now 0.10 EUR (0.745 DKK) per KWH. It is an improvement from the previous 0.08 EUR (0.60 DKK) or lower, and thus a new incentive has arrived. As a consequence of that, the national biogas production is expected to triple by the year 2020. In the period 2010 - 2012 the government intends to subsidise the construction of new biogas plants (Biogasbranchen).

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Benefits

A biogas plant offers advantages for waste management, and the biogas plant produces liquid fertilizer and fibre for compost. As a result, it has a number of benefits:

- lower emissions of greenhouse gases,
- milder odour than slurry when fertilizing the fields,
- cost savings in slurry transportation and fertilizer purchase,
- better use of the fertilizer in a mix of cow and pig manure,
- fewer nutrients are washed out,
- weeds and pathogens are killed,
- waste is recycled in accordance with the national waste plan,
- there is a tax on waste if incinerated but not if recycled,
- organic waste in landfill is avoided,
- heat can be fed into the district heating network, and
- it contributes to the renewable energy island status, which attracts visitors.

Even though biogas is renewable energy, it does not necessarily reduce CO_2. If for example the biogas is used for heating in the Ballen-Brundby area, the district heating plant there is already renewable (straw fired), and there will be no CO_2 reduction. The electric production, however, feeds into the grid and substitutes coal in a coal fired power plant on the mainland; that will contribute to the island's CO_2 reduction.

The municipal waste at Samso amounts to 6 500 tons per year, or 1.5 tons per citizen. The organic fraction is 25%. In order to achieve a reduction in landfill area, the waste must be separated first, because a biogas plant is sensitive to plastic, glas, and metal in the raw feed.

If an animal farmer delivers to a central biogas plant, he can save a slurry tank at his own farm; the biogas company offers the storage and maintenance. A study in Lintrup showed overall cost savings for the farmer at 0.67 EUR (5 DKK) per delivered cubic meter of slurry (Hjort-Gregersen 1999).

About BIORES

The BIORES project addresses two important issues faced by islands:

- energy dependency from the mainland, and
- waste management.

The project has published several reports by now, which are available at the website below (BIORES).

References

1. Biogasbranchen, www.biogasbranchen.dk
2. BIORES, www.biores.eu
3. Hjort-Gregersen, *Centralised Biogas Plants*. Danish Institute of Agricultural and Fisheries Economics, 1999.
4. Planenergi, *Biogasanlæg på Samsø* (Biogas plants on Samso). Samsø Energiselskab, 2002.

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