

Agricultural Biogas plant



DAIO Engineering, Co.Ltd., Tokyo JAPAN

The Biogas plant was erected by our license-partner DAIO Engineering at a dairy-farm located in Shimosetsuri, Pref. Kushiro, Hokkaido island, in the northern part of Japan. In act within a Know-how transfer contract the plant has been calculated and conceptual designed by INNOVAS. The run-up procedure was made together with DAIO and INNOVAS engineers.

In this farm the animals are living in open stables and stands on a bedding of wood shavings and saw dust. The method practiced so far was composting at a windrow. But because of the finely structure and the high water content (approx. 16 – 20 % DM) composting function is only insufficiently. A classic wet fermentation is interfered with the high wood content.



The fermented substratum is stored in an open ultimate disposal tank made from concrete. This high quality liquid fertilizer is used by the farm fields.

Now the composting of the separated solids functioned likewise very well and in short time. The compost has a very good quality.

The solution was found, by one the fresh solid dung, which is daily removed from livestock, is mashed with liquid in a subsurface concrete tank. The solids are removed by using a screw-press separator and the liquid phase flows into a second tank beside the mixing tank. From this tank the liquid is taken out for dilution and fed with the main stream to the fermentor.

If necessary can be use additional digested substratum for more dilution.

The separated solids are discharged by a belt outside the building to a concrete plate from which it would be transported to the compost hall with a wheel loader.

The generated Biogas is used in a central-heating boiler which provides the farm and some dwellings as well as the Biogas plant with warm water and heating energy.

The Biogas is biologically de-sulfured in a separate unit and stored in unpressurized foil bubbles.

Technical data

Substratum input

Solid dung from cattle ca. 6.000 t/a

Mash for Biogas plant ca. 16 t/d

Output

Biogas yield, average 400 – 500 m³/d

Liquid fertilizer ca. 5.000 m³/a

Wood and fibers (for compost) ca. 800 t/a

Biogas quality

Methane content > 65 % CH₄

Hydrogen sulfide (H₂S) < 200 ppm

Size of plant

Biogas fermentor 532 m³

Mixing and pre-storage tanks ca. 50 + 100 m³

Final storage ca. 2.700 m³



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