Installation of an energy-saving fermenter-agitator in Japan

Success Story

Picture: Schmack Biogas GmbH

Operator
Streisal GmbH

Location of the project

Shihoro, Kato District Hokkaido, Japan

Project results

Physical

- Improved mixing

Thermodynamics

- Lower electric energy process

Economical

- Lower operation costs
- Lower maintenance costs

Socio-environmental:

- Renewable electricity or heat supply

Project outline

After nuclear plant catastrophe in Fukushima, Japan changed course of its energy policy and introduced new Feed-in Tariffs (FIT) for renewable energy. Biogas has received one of the highest support within other sources and the net electricity can be sold at very favourable rates of 40.95 ¥/kWh (approx. 0.33 €/kWh) for biogas from sewage sludge and manure. Biogas plants in Japan are fed usually with manure and waste only, which have usually lower energy content, high volume (dry matter content between 8% and 10%) and require bigger reactors. Plant builders require a very reliable stirring solution with maximum possible efficiency and low maintenance to make the investment economically feasible.

Technical data

Year of plant construction:
2012

Year of performed service:
2012 - today

Plant size: 60 kW

Digester volume:
780 m^3(hydraulic tank)

Gas storage: 3,100 m^3

HRT : 30 days

Type of raw material:
Cow manure

Utilisation of biogas:
Combined heat and power

Heat utilisation:
Heating farm houses and barns

Utilisation of digestate:
Fertiliser

Performed actions

A new agitator streisal Biobull® (11 kW_{el}) has been installed in September 2012 and few months later the plant in Shihoro has been in start-up phase. The efficiency of an agitator is basically determined by the mechanical efficiency of the propeller (profile, diameter, etc.), the turning speed (low speed is much more efficient than high speed, because the losses are lower) and the efficiency of the motor. The maximum efficiency in installed mixer has been achieved thanks to large propellers and low, frequency controlled speed, what is beneficial for the biological system.

Results of performed service

Already in the first weeks of the plant operation, it has been proved that internal energy consumption of the plant was lower than in previously installed, comparable biogas plants in Japan. The mixer provides optimum serviceability, because all important wear parts are mounted externally and are thus easy to access for maintenance. As a result, the fermenter doesn`t have to be opened for service work, and the biological processes inside of the reactor are not influenced.

Well-adopted technology for anaerobic digestion of liquid substances can help to reduce volumes of animal manure and to create additional revenue for the plant operator.

Picture: Schmack Biogas GmbH