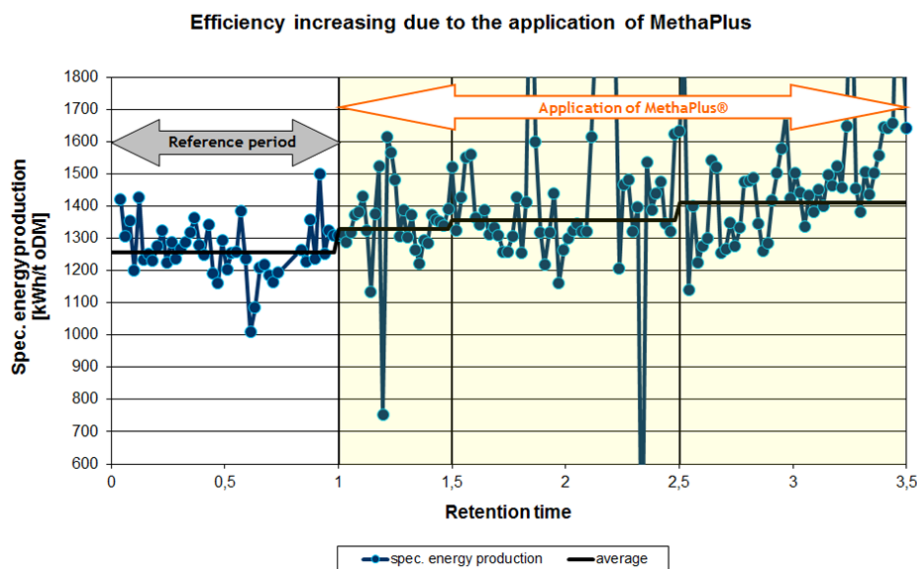


Driving efficiency improvements through MethaPlus® L100 enzyme

SUCCESS STORY



Operator

DSM Food Specialties B.V. -
DFS Enzyme Solutions - Biogas

Location of the project

Klostermansfeld, Germany



Contact details

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Project results

Biochemical

- Higher biogas/methane output
- Increased process stability

Economical

- Lower operation costs
- Significant increase of specific energy production by 12%
- Raw material savings of 3 tons fresh corn silage each day
- Less digestate transportation costs

Socio-environmental:

- Renewable electricity or heat supply

Project outline

The development of hydrolytic enzymes to support the speed-limiting step of the biogas process, the degradation of fibres and other lignocelluloses is an important development the biogas processes of the future.

The enzyme product **MethaPlus®** L100 especially developed to enhance anaerobic digestion was used in biogas plant Klostermansfeld with the aim of improving both the energy yield and the mixing properties. **MethaPlus®** is a DSM owned brand.

Technical data

Year of performed service:

2011 - today

Plant size: 834 kW_{el}, Agrafarm Technologies AG

Digester volume:

Fermenter: 1,600 m³

Storage 3,600 m³

HRT : ~106 days

Process temperature: Mesophilic

Type of raw material:

Corn silage, grass silages, grain

Utilisation of biogas:

Conversion into electricity by CHP

Utilisation of digestate:

Fertiliser



Picture: DSM Biogas

Performed actions

The study started with a reference period (one hydraulic retention time, HRT) to define the actual energy consumption and output of the biogas plant, which will serve as a reference period to enzyme application. Afterwards, enzyme application followed on a daily basis. For the overall assessment the process was observed during 3.5 hydraulic retention times. During the entire period of experiment, the daily production of energy was recorded and compared with the daily feed amount of substrate based on biweekly substrate analysis (dry matter = DM, organic dry matter = oDM). These tests are used for evaluation of the performance of the biogas plant. Also the energy consumption of the stirrers inside of fermenter was monitored to record the changes in mixing.

Results of performed service

Through application of the enzyme **MethaPlus**[®] L100, the specific energy production from crop has increased by 12% in comparison to the reference period (see front page picture). Due to reduction of the mass viscosity in fermenter the overall energy consumption of stirrers has decreased by 30%. As a consequence, the biogas plant saves every day up to 1.5 t oDM of the substrate (4.5 t FM), resulting in financial saving of 45-65,000€/a (30-45 €/t FM). Thanks to additive application, the operator requires less land for energy crop production. Also amount of the digestate has been lowered, which allowed to store it for longer period of time and save costs on disposal facility.

In a majority of cases, savings on investment and substrate are essential to improve economic efficiency of the biogas plant.