

TRAINING MATERIALS

Title:

Technology for N recovery as ammonium sulphate from co-digestion of corn silage, chicken manure and other biowaste by BENAS process

Training:

What is the technology?

The BENAS biogas plant provides a modified stripping process to recover N from digestate and produce two marketable fertilizers: 25% ammonium sulphate (AmS) solution and solid calcium carbonate fertilizer (Lime, 70% DM).

Who is the vendor of the technology?

The GNS Company was founded in 1998 at the initiative of the Society for Ecological Utilization of Materials (FÖST e.V.) to conduct research on practical technologies for improving the sustainable utilization of natural materials.

The highly qualified management and staff provide years of experience in a wide variety of applications. Together with partner companies, GNS offers full proficiency for complex tasks, ranging from scientific proposals and technological development to the supervision of project implementation.

Which other product/technologies are provided by the vendor?

https://nutriman.net/farmer-platform/product/id_667.

Which are the advantages of the technology and the problems addressed?

This process achieved a recovery rate of 80% of ammonia contained in the digestate. It reduces the greenhouse gas emissions by lowering CO₂ emissions from digestate transportation and reduce ammonia, nitrate and nitrous oxide emissions. Also the storage and transport costs will decrease with the implementation of the N stripper. The recovered AmS solution is a marketable fertiliser for closing fertilizer loops

How does the technology work?

The BENAS biogas plant yearly treats more than 80 000 ton of crop, food waste and poultry manure via anaerobic digestion. The generated digestate will go through a modified stripping process, in which a Flue Gas Desulphurisation-gypsum (FGD-gypsum) from FGD of coal power plants is added to produce a concentrated marketable ammonium sulphate solution (25% AmS) and a solid calcium carbonate fertilizer (Lime, 70% DM). This process does not require any external heat source and relies solely on the exhaust heat from the CHP engine, with an average consumption of 100 kWh/m³ of digestate.

The process further implements with the FiberPlus System has achieved the production of ammonia-free fibers suitable for different applications in the fiber and timber industries (i.e. fiberboard). Emissions and loss of N are reduced. Recovered nutrients in the system are 67% of $\text{NH}_4\text{-N}$ as AmS and 6% of $\text{NH}_4\text{-N}$ as Lime; 6% of P and 5% of K as fibers.

How/where to use the technology?

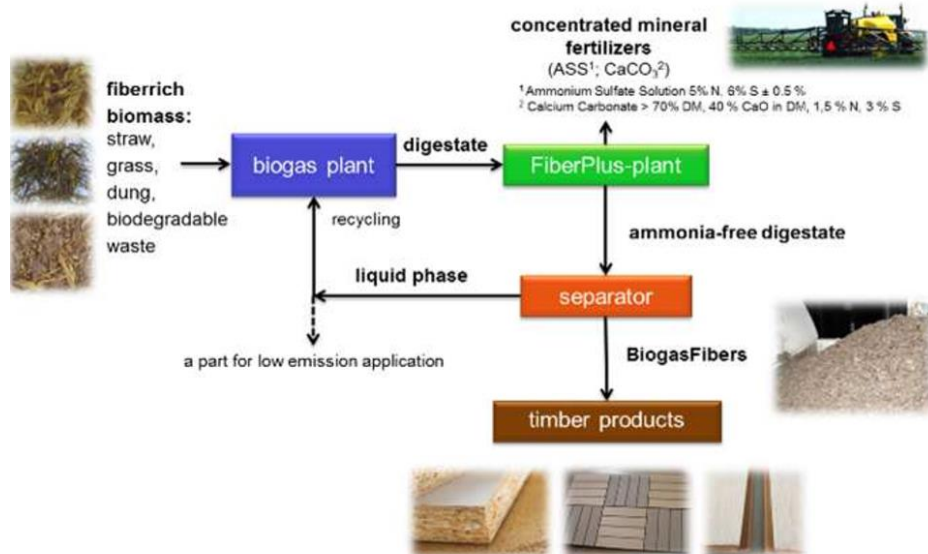
This technology helps to treat the digestate from the biogas plant and produce two marketable fertilisers as ammonium sulphate solution and solid calcium carbonate.

Which are the authority permits and in which EU countries?

This technology is authorized by the regional approval authority in Germany and the application the products follows the German fertilizer regulations.

How much does it cost?

The cost for this technology is estimated to be 5,7 € per ton digestate.



The flow chart of BENAS process implements with the FiberPlus System

For more information: https://nutriman.net/farmer-platform/technology/id_668