

TRAINING MATERIAL

Title:

Technology for N Recovery as liquid ammonium sulphate or ammonium nitrate starting from separated liquid slurry with "Circular Values" stripping and scrubbing process (ID:265)

Training:

What is the technology?

This technology provided by Circular Values offers an extraction of nitrogen from a variety of possible waste streams (liquid slurries, liquid fraction digestate, discharged water,..) through stripping of nitrogen and acidic scrubbing

Who is the vendor of the product/technology?

The provider/vendor of the scrubbing technologies is Circular Values (<https://circularvalues.eu/>). Circular is an innovative Dutch company active in the business of upgrading agricultural residual products. Particularly in the supply of turn-key installations, concepts and offering process guidance relative to refining waste streams into useful nutrients and/or fibres.

Which other technologies are provided by the vendor?

Circular Values offers several types of N refining units alongside waste water or dewatering treatment units.

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

The variety of possible input streams the technology is able to handle (manure and other slurries, digestates, discharge water,...) is a main advantage alongside being a competitively priced technology. This process produces a nitrogen fertilizer free from pathogens, insect larvae and weed seeds.

How does the technology work?

First the slurry, digestate or discharged water is separated for further treatment of the liquid fraction. Then the stripping is performed by blowing air through the liquid fraction of the slurry or digestate while increasing temperature or pH (e.g. with CaOH) which will gasify the mineral nitrogen (NH₃). Afterwards the NH₃-filled air will be washed with acidified (HNO₃ or H₂SO₄) water (scrubbing) to capture the ammonium again in liquid form (ammonium sulfate from H₂SO₄ or ammonium nitrate from HNO₃). Circular Values static units can be profitable when the farmer has production of 4000 kg N and more (>1000 tons manure/digestate). For lower than 4000 kg a mobile Circular Values solution can fit. The recovery capacity is up to 85% of the ammonium-N from the slurry or digestate. Both cold and hot stripping (10-70 degrees Celsius) are possible. The process can be remotely monitored and controlled.

How/where to use the technology?

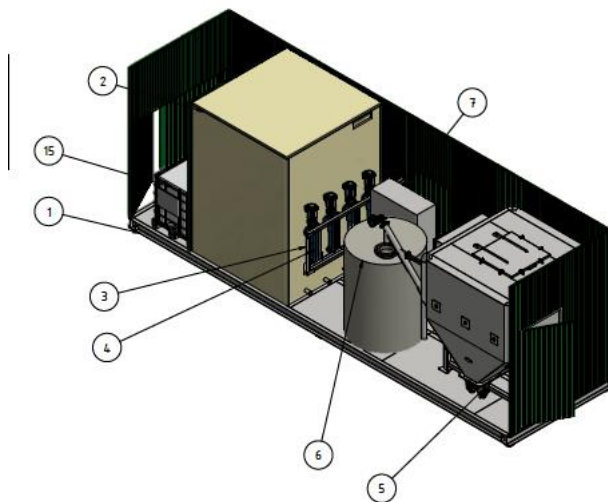
It is a closed process implying no further emissions occur. As it removes the ammonium the NH_3 emission for the digestate or manure is indeed negligible. This technology offers solutions for intensive husbandry in any EU region. Furthermore the high quality fertilizer can replace the production and/or use of artificial fertilizers in such regions where local availability of nitrogen fertilisers is valued.

Which are the authority permits and in which EU countries?

At least an environmental license/permit for installing this technology will have to be asked & obtained from the local authorities. This legislation and authority depends on the specific EU region. For example in Flanders an 'omgevingsvergunning' will be required from the Department of Environment, taking into account BAT (best available technologies) guidelines and recommendations of other advisory bodies.

How much does it cost?

Capital Expenditure for economical industrial scale: 100.000-265.000€. Operational Expenditure for economical industrial scale: 1-3€/ton input



For more information: https://nutriman.net/farmer-platform/technology/id_265