

NETHERLANDS

Farm's performance, restructuring & modernisation

Location

IJsselstein.

Programming period

2014 – 2020

Priority

P2 – Competitiveness

Measure

M4 – Investments in physical assets

Funding (EUR)

Total budget 775 713

EAFRD 125 000

National/Regional 125 000

Private 525 713

Project duration

2017 – 2019

Project promoter

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A pilot project to create an innovative pig farm based on the principle of processing fresh manure to minimise GHG emissions and increase the farm's profitability.

Summary

This pilot project aims to develop the 'stable of the future' which will produce renewable energy in the form of biogas and which will recover nitrogen so that natural gas is no longer needed to make artificial fertilizers. The pilot stable is based on an approach to preventing the generation of unwanted gases and to supporting the generation of sustainable energy from fresh manure. Such a stable will increase the farm's profitability and become an example of modern circular agriculture.



Results

The project will result in an integral, sustainable barn that complies with legislation without the use of an air scrubber.

It will be based on the principle of removing the manure from the barn every day. This prevents the release of ammonia and other harmful gases.

Lessons & Recommendations

- ❑ The main challenge for novel practices is that of ensuring that the whole sector, in this case pig farmers, will apply these techniques on their own farms.
- ❑ Pilot approaches require support from local authorities that grant the necessary permits, but also from investors who are able to think outside the box when it comes to farming practices.

Context

Hans Verhoeven, together with his wife and employees, runs a Demo Farm to help pig farms in Noord-Brabant which are faced with the major challenge of tackling ammonia emissions. The emission standards for ammonia have been tightened, and stringent rules have also been drawn up concerning odour emissions. Installing an air scrubber is a widely-used solution for complying with the changing legislation. With this technique, ammonia, fine dust and odours are filtered out of the air at the end of the barn. However, according to Verhoeven, this has a detrimental effect on conditions inside the barn where it is precisely the provision of a good, stable environment that will ensure healthy livestock, better animal welfare, and therefore better technical and economic results.

In addition, until now, nitrogen fertilizer is produced using natural gas. The bulk, widespread use nitrogen fertilizer has led to a sharp rise in food production. The alarming side effect of this, however, is that more nitrogen has been introduced into the soil with adverse consequences for the groundwater and biodiversity. Hence, a more efficient use of nitrogen is of vital importance.

Objectives

The objective of this project was to set up a 'Stable of the Future' based on a source-oriented approach to preventing the generation of unwanted gases and to using fresh manure to generate sustainable energy.

Activities

The system consists of a combination of techniques that are known to reduce ammonia emissions. One of the most important parts of this is the daily removal of manure from the stable. Daily denitrogenating prevents the occurrence of ammonia in the barn, among other things. The new housing system will be combined with mono fermentation, which means that energy can be extracted from the fresh manure.

Usually, the manure stays in the cellar for about six months under the stables while useful substances are broken down and ammonia and methane gases are released. That is a bad practice for the environment as the highly unpleasant odours that are released are unhealthy for both the animals and the farmer. That is why it is better to remove the manure from the barn every day. Also, fresh manure yields about six times more biogas than old manure. Heat and electricity is again produced

from the biogas; which is then used on the farm. Finally, the digestate (that which remains from the digester of the farm) is thinner than normal manure and easier to absorb by the crops on the land. Moreover, it is odourless.

In this context, fresh manure in the 'Stable of the Future' is being used more effectively. A mono-fermenter is used to convert fresh manure into biogas. The digester used is also different from most digesters in the Netherlands as it includes a plug flow fermenter. Most fermenters are stirred digesters, where the added manure is mixed with what is already in the digester. The fresh manure comes as a 'plug' in the plug flow fermenter and is fed through the digester in its entirety, which naturally involves some mixing. There are indications that this digester produces more biogas, but that has yet to be determined. For the time being, the farm is mainly looking at whether such a digester is easy to use and how this technology can be optimised.

Main results

After years of investment, research and innovation the farm in cooperation with the Sustainable Pork Value Chain Association 'Keten Duurzaam Varkensvlees', aim to develop an integral sustainable barn that complies with legislation without the use of an air scrubber. This is based on the principle of removing the manure every day, which prevents the release of ammonia and other harmful gases. This will render the practice of filtering the air at the end of the barn completely superfluous.

This technique also offers the possibility of completely closing the cycle by fermenting the fresh manure. The project's investors are convinced that this is the ideal solution for sustainable pig farming in North Brabant and in the rest of the Netherlands.

Main results

The successful development of the 'Stable of the Future' is not enough. The challenge is to ensure that all pig farmers can apply these techniques to their own farms. That is why the farm invests in measuring the ammonia, odour and particle emissions. The farm aims to quantify the impact of the approach on animal health and eventually make this system a widely acknowledged and approved example of best practice that other pig farmers will adopt. In order to complete this process, through thorough and wide-spread testing, the project requires support from the local authorities that grant the necessary permits and also from investors who are able to think outside the box when it comes to farming practices.

Additional sources of information

n/a