

Solving the bottleneck in biogas production

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Credit: Antoni Shkraba from Pexels

Agro-biogas plants produce renewable energy, extracting gas produced in the anaerobic fermentation of animal manures mixed with organic wastes from the food sector. One by-product of this fermentation process is a thick liquid waste called 'digestate', which is difficult to manage but rich in organic matter and minerals.

The EU project WAVALUE ('High added value eco-fertilisers from anaerobic digestion effluent wastes') will demonstrate a cost-effective industrial process for producing a new range of sustainable fertilisers, with digestate as their main component.

"The volume and [nitrogen content](#) of digestate produced in the biogas extraction process are very similar to the original waste treated," says Aritz Lekuona of project coordinator EKONEK Innovacion en Valorizacion de Subproductos.

"Today, despite existing regulation, this material is often spread as fertiliser in [agricultural fields](#) near the biogas plants where it is produced but this is not always the optimal strategy as its high [nutrient content](#) causes soil and [water pollution](#), namely eutrophication. It is also relatively costly - the material is more than 90 percent water, and moving it any distance using trucks is expensive. So figuring out what to do with digestate waste is a serious limiting factor for new biogas projects, especially when [agricultural land](#) is not available nearby for spreading."

With the EU promoting [renewable energy sources](#), the use of biogas should be increasing rapidly. But the digestate problem is actually slowing the development of biogas plants in many EU countries. Lekuona says, WAVALUE researchers understood that digestate could be used to produce valuable fertilisers.

"Our approach will be to develop fertilisers in a granular form," he says, "similar in appearance to small green beans. The process will involve mixing the digestate with [mineral nutrients](#) to get a tailored formula, and then drying the mixture to get small, round, regular-sized granules, with slow-release nutrients that can go into the special fertilisers market."

The WAVALUE pilot plant will be the first of its kind in Europe, producing high-value [fertilisers](#) from digestate and making biogas plants

more profitable. Moreover, the system for fertiliser production from digestate will be easy to incorporate into new or existing agro-biogas plants.

"There are about 6000 biogas plants in Europe today," says Lekuona, "but with the available organic waste, there is a huge potential to multiply this number several times. This project provides a new digestate management solution that will increase the feasibility of new biogas plants, while enhancing the added-value of digestate generated in existing biogas plants.

"From an environmental and social point of view, digestate utilisation as the basis of a high-value product would close the nutrients cycle, reducing greenhouse gas emissions, improving economic performance of agro-biogas plants and solving an environmental issue."

The consortium aims at treating about 900 tonnes of sludge per year in its pilot plant. After the project, two full-sized plants will treat 57 000 tonnes per year. Altogether, the system will save an estimated 11 tonnes of CO₂ emissions per year during the project.

Lekuona adds: "Digestate granulation plants can deliver a reasonable return on investment, based on the sales of the final fertiliser product. This is a relatively new activity that also has the potential to generate new jobs at agro-[biogas plants](#)."

WAVALUE received over EUR 900 000 in EU funding under the Eco-Innovation Programme and will run through 2014.

More information: www.wavalueproject.eu/

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