

# Sustainable green alternatives to fertilisers could boost food and energy security

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Lancaster University scientists are leading research looking at formulating sustainable fertilisers from renewable energy waste.

This new area of research aims to produce a sustainable, environmentally-friendlier source of soil conditioner and crop fertiliser that could also reduce costs to farmers and potentially, with wide-spread take-up, help to slow down rising food prices.

The collaborative project, which also includes Stopford Energy and Environment Limited, the James Hutton Institute and Aqua Enviro Limited, builds upon research originally conducted by Stopford looking at using a mixture of digestates, derived from anaerobic digestion, and ash, from burnt biomass, as an alternative to existing crop fertilisers.

Almost all existing fertilisers, such as phosphorous and nitrate-based products, are produced using energy-intensive methods involving the use of oil and gas. In addition phosphate-based fertiliser relies on the mining of phosphate, a finite and unsustainable resource, and a production process using various toxic chemicals.

As well as providing significant environmental benefits by reducing reliance on fossil fuels, a successful digestate-ash fertiliser would also reduce costs and provide additional income to biomass and anaerobic digestion operators. This could make these forms of [renewable energy](#), which could meet more than 15 per cent of UK energy demand by 2020, more appealing to investors as ash is currently expensively dumped at

landfill.

It could also help to improve food security and reduce costs to farmers as production of digestate-ash fertiliser would not be linked to the global price of oil and gas.

Professor Kirk Semple, from the Lancaster Environment Centre, is leading the project. He said: "The aim of this research is to modify the by-products from [anaerobic digestion](#) and [biomass energy](#) plants to create a new, safe and sustainable source of nutrients for agriculture.

"This would reduce pressure on natural resources and develop a new market for problematic by-products of the bio-energy industry.

"The project represents an excellent collaboration between academia and industry to address some of the major challenges facing food and energy security. Although the project is based here in the UK, we believe there is exciting potential to produce a sustainable alternative to existing fertiliser use across the globe."

The three-year project has received £856,484 funding from NERC – the Natural Environment Research Council Research, due to start this year, will take place in labs at Lancaster University and in field trials.

Dr Ben Herbert, Director of Research and Environment at Stopford Energy and Environment, an independent consulting company based in offices at Lancaster University's Environment Centre, said: "this research has the potential to transform the long-term economic viability of the bio-energy sector by turning by-products, which at present have limited commercial value, into saleable land conditioners for use in agriculture."

Previous studies by Stopford Energy & Environment have shown that

biomass-ash and digestate can be useful nutrient sources for crops in conditions low in nutrients. Ash is rich in micro and macro-nutrients. Anaerobic digestate is a rich source of trace metals and nitrogen.

The research also involves partnering with industry partners to ensure the resulting product meets the requirements of farmers and bio-[energy](#) producers.

**More information:** [www.lancaster.ac.uk/media/lanc ... Catalyst-Project.pdf](http://www.lancaster.ac.uk/media/lanc...Catalyst-Project.pdf)

Provided by Lancaster University

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