New research reveals anaerobic digestion could undermine UK net-zero emissions

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New research reveals that anaerobic digestion could undermine UK net-zero emissions. Alternatives to anaerobic digestion are needed to tackle the climate crisis. Anaerobic digestion (AD) has been touted as an

environmental silver bullet, providing renewable energy in the form of biogas from organic materials including food waste. However, its benefits have been vastly overstated—and pursuing AD as part of the UK's environmental policy could actively hamper progress towards reaching net zero carbon emissions.

Based on research by Bangor University, Feedback's "Bad Energy" report reveals that, contrary to industry claims, AD has a limited role to play in a sustainable future. While it compares favorably to the most environmentally damaging methods of energy generation and waste disposal, there is a raft of alternatives to AD that can better mitigate the UK's carbon emissions, while also making more food available.

The research models a "climate-optimized" scenario that prioritizes sustainable alternatives to AD such as scaling up food waste prevention, afforestation of land, planting food for human consumption, and building solar photovoltaic. This is compared to an "industry-driven" scenario based on the AD industry's current growth ambitions. The climate-optimized scenario achieves roughly twice the emissions mitigation of the AD industry-driven scenario—15% of the UK's total national emissions compared with 7.7%. Food waste: the need for prevention One of the AD industry's leading claimed benefits is that it provides a sustainable solution to food waste, by turning it into renewable energy.

However, the research found that preventing food waste has significantly stronger environmental outcomes. Preventing food waste results in direct emissions savings over nine times higher than sending food waste to AD. Halving UK food waste, with afforestation on the roughly 3 million hectares of grassland spared, would save and offset about 11.3% of the UK's current total greenhouse gas emissions.

Food security is an increasingly relevant concern following issues

highlighted by COVID-19, and Brexit presents an opportunity to rethink the UK's food systems. Halving UK food waste would save enough cropland to produce enough calories to feed 7.9 million people (nearly 10% of the UK population). UK businesses are currently aiming for far less ambitious food waste reduction targets set out by the Courtauld Commitment, to reduce carbon and waste associated with food and drink by one-fifth.

Even if these are met, and remaining food waste is sent to AD, we would see 63% lower emissions mitigation and a 43% lower yield of calories and protein compared to the climate-optimized scenario. These commitments are currently voluntary, and most food-related businesses provide limited reporting on their food waste figures.

Taking action: recommendations for change

To date, the government's solution to the food waste left over by voluntary agreements has been to subsidize AD, while defunding food waste prevention. Based on the report findings, Feedback calls for ambitious new regulations on food waste:

- Reduced subsidies for AD, and increased funding for food waste measurement and prevention.
- Increased taxes on landfill and incineration, so that AD is incentivised as a last resort.
- Mandatory food waste measurement and reporting for all large food businesses from farm to fork.
- Binding statutory targets for the UK to reduce its food waste by 50% from farm to fork by 2030, with compulsory contributions from large food businesses towards this target.

In the early to mid-2010s, generous government subsidies made AD a lucrative and fast-growing industry. Despite a recent decline in subsidies,

the AD industry still hopes to grow to 16–30 times its current size by 2032. Feedback's recommendations cover four key climate policy issue areas, and in all cases encourage a move away from AD towards alternatives. An overarching recommendation is to reduce or remove the subsidies that prop up the AD industry.

Carina Millstone, executive director of Feedback, says:

"Tackling the climate crisis, and doing it in an equitable way, calls for the highest ambition—not second-best approaches. The AD industry has made a lot of promises that it simply cannot fulfill. Our findings make clear that AD is not the climate solution we need—it is a distraction at best, and a dangerous hindrance at worst. The data shows that, in the race to net zero, a range of well-thought out alternatives can get us there more efficiently, and with greater benefits for the UK's food security. A lack of political ambition has led to AD being used as a sticking plaster, particularly when it comes to the UK's strategy for tackling food waste. Worryingly, current strategies can actively hinder waste prevention. We need to see urgent policy updates that support approaches that work in the long-term and prevent industries that only serve their investors from hampering the UK's progress towards critical climate goals."

Sam Packer, policy officer at the Soil Association said: "This timely report from Feedback shows how using valuable land to grow crops for energy is largely a waste of time, money and resources. Climate change needs radical solutions, growing annual crops for anaerobic digestion is not one. Growing maize for energy is a subsidized form of soil destruction. Maize crops generally leave soils exposed to erosion and are harvested late exacerbating soil erosion. A 2015 Soil Association report showed that 75% of late harvested maize sites showed high or severe levels of soil erosion.

"For climate, nature and food security this practice must end. New

research findings show how on the same hectare of land solar PV produces energy 12-18 times more efficiently than crops for bioenergy, this should settle the score over energy strategies to meet UK net zero targets. Anaerobic digestion is a solution turned into a problem. Policy makers should recognize its limited role in reaching net zero. There is a role for AD in reducing greenhouse gas emissions from manures and food waste, but this needs to be about emissions reduction not diverting food crops."

Provided by Bangor University

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