

# Ireland's first grass-fed biorefinery hits the road to help farmers go green

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Credit: James Gaffey/Biorefinery Glas

Along the windy west coast of Ireland a biorefinery on wheels is turning grass into a series of different green products that could give farmers a more diversified source of income.

"This is Ireland's first grass-fed biorefinery," said James Gaffey, a researcher at the University of Tralee in county Kerry which is leading

the project. "And it's the first step looking at grass-based [bioeconomy](#) options for Ireland."

The bioeconomy is a concept that uses renewable resources from nature or [organic waste](#) and turns them into valuable new products. The EU see the bioeconomy as a key strategy to address some of the most pressing environmental challenges and.

In Ireland, where agriculture accounts for over a third of its emissions, the biorefinery is being trialled as a solution to improve the farming sector's sustainability. "We're the only country in Europe with over 50% of grassland," said Gaffey, adding that this ready supply provides plenty for the biorefinery to work with, which it separates into a juice and a fibre.

The juice is turned into a dry protein-rich cake that can be absorbed easier by cows so it generates less emissions from their digestion process or from feeding them other feed, like soy beans imported from Brazil.

"We could improve the overall protein availability per hectare [of grass] by around 40%," said Gaffey. "That can improve the availability on indigenous non-GMO (genetically modified) protein."

This could translate into a reduced demand from Ireland, and the EU, on imported soy as an animal feed, which is one of the main commodities driving deforestation in South America as well as a key source of greenhouse gas emissions.

The leftover fibre can be processed into a sustainable alternative to synthetic fertiliser or used as a more efficient supply of fuel for anaerobic digesters, which breaks down the biological material and turns it into natural gas. Both solutions would take another chunk out of Ireland's agricultural greenhouse gas emissions.

These different sustainable products could also help farmers enter new markets.

"We're working on using the fibre as feedstock for a liquid cellulose process, which is a building block that could be used as an alternative to PET (polyethylene terephthalate) plastic," said Gaffey.

All these grass based bio-products have export potential and that would add further value to Ireland's agriculture sector. It would also help Irish farmers diversify their income and improve their resilience against fluctuating [food prices](#) from the dominant beef and dairy sectors in the country.

Because of this potential, the biorefinery project is working directly with a cooperative of farmers in the west of Ireland. The idea is to keep control in their hands rather than hand over the power to big agrifood businesses.

"80% of the jobs the bioeconomy will create will be in rural communities," said Gaffey. "We need to think about how to frame the bioeconomy to really make an impact."

The next step for the mobile biorefinery is to recruit enough farmers to establish a network that can help prove the potential of the bioeconomy. To do this Gaffey will demonstrate the technology to different farmer groups which he hopes will help them see the untapped value in each blade of grass.

A lot of sectors and businesses are already apart of the bioeconomy, but they don't realise it yet, according to Nikolaos Ntavos, a manager at the [bioenergy and environment business cluster of western Macedonia, or CLUBE](#).

This, he says, prevents them taking advantage of the opportunities it presents as well as from accessing the available bioeconomy funds and support services available to them. "This is not helpful for the bioeconomy to evolve and grow," he said.

## **Creating scale, stimulating a new wave of entrepreneurship**

CLUBE is a member of the EU-wide [RUBIZMO project, which is a collection of clusters aiming to stimulate similar bioeconomy businesses and entrepreneurs](#) elsewhere. If fully utilised the EU thinks the bioeconomy could create an additional one million jobs by 2030, generally in rural or [coastal areas](#) where employment is needed to curb the exodus of its people to cities.

Ntavos is working with different businesses in Macedonia and Greece to help them reinvent their business models and drive the bioeconomy forward. One example is a food cooperative that recently joined CLUBE, together they are trying to find ways to make new products from their [food waste](#) – like peelings, rotten leftovers and kernels.

"We are trying to link our SMEs (small- and medium- enterprises) with the R&D institutes in the area of bioeconomy to help them collaborate and make more innovative products," said Ntavos.

This could have a huge impact in many areas of northern Greece and Macedonia where there is a lot waste leftover from [agricultural production](#), like wine, olive oil, cereals and fruit production, as well as forestry.

The EU is planning to invest €10 billion during 2021-27 to help the bioeconomy take shape. This cash will certainly help incentivise more

businesses to get involved, but if the right controls are not put in place it could risk exasperating the [environmental challenges](#) we already face.

According to Alex Mason, senior policy officer at the World Wildlife Fund's European office, the EU bioeconomy strategy needs to focus on optimising biomass that would otherwise have no use, like agricultural waste and residues.

"The supply of sustainable biomass, waste and residues, is limited – there is some, but don't get carried away," said Mason. "We have to be careful that we don't do something that is counterproductive."

For instance, if a farmer grows rapeseed purely for bioplastic or biofuel and uses intensive practices, like artificial fertiliser, it may emit more greenhouse gases than a plastic made with conventional oil, especially if the bioplastic is incinerated soon after its used.

A big reason for this is that when land is used purely for biofuel, for example, it could see land elsewhere converted into agricultural because there is still food demand to be met. This [land-use change](#), like deforestation, could end up causing a surge of greenhouse gas emissions; adding to the environmental challenge we face.

"If they [the EU] are not careful they may actually make things worse," said Mason.

Provided by European Science Communication Institute

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