# Northern Ireland tackles water pollution with biomethane from livestock waste



Northern Ireland’s waterways, particularly the iconic Lough Neagh, are facing an ecological crisis, exacerbated by the region's flourishing agricultural sector. This paradox emerges from the fact that while Northern Ireland’s farms produce sufficient protein to feed 10 million people, they also generate significant environmental challenges—most notably, water pollution from livestock slurry and excess phosphorus. In fact, agriculture contributes around 62% of the phosphorus contaminating local waterbodies, leading to harmful algal blooms that threaten both marine life and human communities relying on clean water.

Recent assessments reveal concerning statistics: over 70% of water bodies in Northern Ireland do not meet the required ecological standards, largely due to high phosphorus levels, causing widespread issues like the severe blue-green algal bloom witnessed in Lough Neagh in 2023. Such blooms can endanger the drinking water supply for over 40% of the region's population. This environmental degradation calls for urgent and innovative responses.

In an ambitious effort to rectify this situation, the Department of Agriculture, Environment and Rural Affairs (DAERA) is championing a shift towards circular economy solutions. Central to this initiative is biomethane production, which harnesses organic waste, including livestock slurry, to generate clean energy. This not only offers a means to mitigate greenhouse gas emissions—estimated reductions could reach approximately 845,000 tonnes of CO₂ annually—but also addresses nutrient runoff by transforming waste into a valuable resource. Researchers from Queen's University Belfast posit that over 6,000 GWh of biomethane could be derived from livestock waste, potentially meeting more than 80% of the region's gas distribution network demand.

One innovative project spearheaded by Blakiston Houston Estate Ltd demonstrates the practical application of these concepts. The estate has developed mobile separators to extract liquid and solid components from slurry, allowing the liquid to be used as fertiliser for crops while the solids are directed to anaerobic digestion facilities. This dual process not only generates biogas but also creates nutrient-rich digestate, which is then converted into biofertiliser, enhancing agricultural viability while helping to curb pollution.

Supporting this initiative is a coalition led by the Centre for Competitiveness, which is establishing a 10MW biorefinery in Mid-Ulster. This facility aims to inject biomethane directly into the energy grid, while also converting leftover digestate into biochar—a carbon-rich material with applications in construction. Such developments not only showcase technological innovation but also represent a shift in perception: agricultural byproducts are increasingly viewed as valuable opportunities rather than burdens.

The success of these initiatives hinges on a strategic framework grounded in education, investment, regulation, and enforcement. DAERA's Green Growth Strategy aims to support sustainable farming practices while restoring natural habitats, thus offering a holistic approach to overcoming the dual challenges of pollution and agricultural productivity. This comprehensive strategy seeks not only to address immediate ecological concerns but also to ensure that rural communities benefit from green energy jobs, thereby fostering a resilient economic landscape.

The lessons emerging from Northern Ireland's agricultural transformation resonate well beyond its borders. The integration of sustainable practices into farming can potentially serve as a model for other regions grappling with similar environmental challenges. By embracing innovation and fostering cooperative efforts among stakeholders, Northern Ireland can illustrate that sustainable agriculture is not merely about balance—it is an opportunity for renewal and revitalisation.

As this green agenda unfolds, the importance of collaboration among farmers, policymakers, and technology providers becomes ever more evident. Farmers are encouraged to undertake nutrient audits and seek guidance from DAERA for financial support in adopting these transformative practices. The emphasis on nutrient budgeting and efficient waste management is crucial not only for addressing existing problems but also for preventing future ecological degradation.

In summary, Northern Ireland is at a pivotal juncture where agricultural innovation meets climate responsibility. By leveraging biomethane production and circular economy principles, the region is poised to emerge as a beacon of sustainable farming practices. The journey towards a harmonious coexistence of agricultural productivity and environmental health has begun, offering a hopeful glimpse of what the future can hold for rural communities around the world.

## Reference Map:

* Paragraph 1 – [[1]](https://www.coletivometranca.com.br/en/news_en/the-bold-bet-transforming-northern-irelands-food-future-and-restoring-its-waterways/69751/), [[2]](https://www.qub.ac.uk/News/Allnews/2022/transforming-livestock-manure-and-silage-biomethane.html)
* Paragraph 2 – [[1]](https://www.coletivometranca.com.br/en/news_en/the-bold-bet-transforming-northern-irelands-food-future-and-restoring-its-waterways/69751/), [[3]](https://www.northernireland.gov.uk/news/ps600000-awarded-ni-companies-fund-sustainable-solutions-livestock-slurry)
* Paragraph 3 – [[1]](https://www.coletivometranca.com.br/en/news_en/the-bold-bet-transforming-northern-irelands-food-future-and-restoring-its-waterways/69751/), [[4]](https://pure.qub.ac.uk/en/studentTheses/the-sustainability-of-organic-nutrient-recycling-in-northern-irel), [[5]](https://www.agriland.co.uk/farming-news/progress-made-on-extracting-phosphorus-from-slurries-mcaleer/)
* Paragraph 4 – [[6]](https://www.bbc.com/news/articles/cvgd4qp1qzzo), [[7]](https://www.farmersjournal.ie/more/northern-ireland/gas-from-separated-slurry-at-scale-in-ni-836081)
* Paragraph 5 – [[1]](https://www.coletivometranca.com.br/en/news_en/the-bold-bet-transforming-northern-irelands-food-future-and-restoring-its-waterways/69751/), [[3]](https://www.northernireland.gov.uk/news/ps600000-awarded-ni-companies-fund-sustainable-solutions-livestock-slurry), [[6]](https://www.bbc.com/news/articles/cvgd4qp1qzzo)
* Paragraph 6 – [[2]](https://www.qub.ac.uk/News/Allnews/2022/transforming-livestock-manure-and-silage-biomethane.html), [[4]](https://pure.qub.ac.uk/en/studentTheses/the-sustainability-of-organic-nutrient-recycling-in-northern-irel), [[5]](https://www.agriland.co.uk/farming-news/progress-made-on-extracting-phosphorus-from-slurries-mcaleer/)
* Paragraph 7 – [[1]](https://www.coletivometranca.com.br/en/news_en/the-bold-bet-transforming-northern-irelands-food-future-and-restoring-its-waterways/69751/), [[4]](https://pure.qub.ac.uk/en/studentTheses/the-sustainability-of-organic-nutrient-recycling-in-northern-irel)
* Paragraph 8 – [[2]](https://www.qub.ac.uk/News/Allnews/2022/transforming-livestock-manure-and-silage-biomethane.html), [[5]](https://www.agriland.co.uk/farming-news/progress-made-on-extracting-phosphorus-from-slurries-mcaleer/)
* Paragraph 9 – [[1]](https://www.coletivometranca.com.br/en/news_en/the-bold-bet-transforming-northern-irelands-food-future-and-restoring-its-waterways/69751/), [[6]](https://www.bbc.com/news/articles/cvgd4qp1qzzo)

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## Bibliography

1. <https://www.coletivometranca.com.br/en/news_en/the-bold-bet-transforming-northern-irelands-food-future-and-restoring-its-waterways/69751/> - Please view link - unable to able to access data
2. <https://www.qub.ac.uk/News/Allnews/2022/transforming-livestock-manure-and-silage-biomethane.html> - Researchers at Queen's University Belfast have found that converting livestock manure and grass silage into biomethane could significantly reduce Northern Ireland's carbon footprint. The study estimates that over 6,000 GWh of biomethane could be produced, meeting more than 80% of the region's gas distribution network demand. This process could lead to a reduction of approximately 845,000 tonnes of CO₂ emissions annually, equivalent to driving a family diesel car around the globe 170,000 times. The research highlights the potential of anaerobic digestion in decarbonising the gas grid and addressing environmental concerns associated with livestock waste.
3. <https://www.northernireland.gov.uk/news/ps600000-awarded-ni-companies-fund-sustainable-solutions-livestock-slurry> - Six Northern Ireland companies have been awarded a total of £600,000 to develop practical and environmentally friendly solutions for livestock slurry. The initiative, led by the Department of Agriculture, Environment and Rural Affairs (DAERA) and co-funded by the Department for the Economy's Small Business Research Initiative (SBRI) and DAERA's Green Growth Fund, aims to reduce surplus phosphorus and ensure efficient recycling of organic nutrients within Northern Ireland agriculture, contributing to climate targets. The funding will support the development of demonstration plants for a bio-circular economy, focusing on separating slurry to produce feedstock for renewable energy and processing nutrients for use as fertiliser or export.
4. <https://pure.qub.ac.uk/en/studentTheses/the-sustainability-of-organic-nutrient-recycling-in-northern-irel> - A doctoral thesis from Queen's University Belfast investigates the sustainability of organic nutrient recycling in Northern Ireland, focusing on manure management and potential beyond-the-farm-gate strategies. The study found that 14% of farms have nitrogen surpluses, and 30% have phosphorus surpluses, with high imbalances concentrated in the south. It suggests that nutrient realignment through manure redistribution and large-scale anaerobic digestion could recover significant amounts of phosphorus, contributing to decarbonising the gas infrastructure. The research highlights the need for increased uptake of nutrient recovery technologies and up-to-date soil data to inform nutrient budgeting for sustainable agriculture development.
5. <https://www.agriland.co.uk/farming-news/progress-made-on-extracting-phosphorus-from-slurries-mcaleer/> - Sinn Féin spokesperson for agriculture in Northern Ireland, MLA Declan McAleer, believes that progress has been made in developing systems capable of extracting phosphorus from slurries. This development is linked to the rolling out of the Sustainable Utilisation of Livestock Slurry programme, introduced by the Department of Agriculture, Environment and Rural Affairs (DAERA) last year. The initiative has been co-funded by Stormont’s Department for the Economy under the auspices of Northern Ireland’s Strategic Investment Board (SIB). The new programme has been designed to take forward the development of projects, which act to reduce surplus phosphorus within production agriculture and ensure efficient recycling of organic nutrients.
6. <https://www.bbc.com/news/articles/cvgd4qp1qzzo> - A County Down company has been awarded £4m over three years to help reduce excess phosphorus coming from slurry. Phosphorus largely coming from agricultural runoff contributes to high nutrient levels in Lough Neagh, which help create the conditions for blue-green algae to bloom. The Sustainable Utilisation of Livestock Slurry (SULS) programme was launched by the Department of Agriculture, Environment and Rural Affairs (DAERA) in 2023. BH Estates near Dundonald was among six companies selected in Phase One of the Small Business Research Initiative competition to develop proof of concept solutions for removing excess phosphorus in cattle and pig slurry.
7. <https://www.farmersjournal.ie/more/northern-ireland/gas-from-separated-slurry-at-scale-in-ni-836081> - Northern Ireland has a bold plan to tackle agriculture’s nutrients problem, while building a new biomethane industry. The second phase of the Small Business Research Initiative (SBRI) programme will see slurry separation at scale. The Anaerobic Digestion and Bioresources Association’s annual Northern Ireland conference in Belfast focused on tackling the nutrient problems facing the region. Nutrient problems in Northern Ireland have gained attention due to the visible impact of algal blooms on Lough Neagh. The next step of the initiative will be phase two, in which three of the initial six projects will be awarded £12m to demonstrate their solutions at scale.