

*The Biomethane for Carbon and Community project is co-funded by the Government of Ireland and the European Union through the EU Just Transition Fund Programme 2021-2027.*

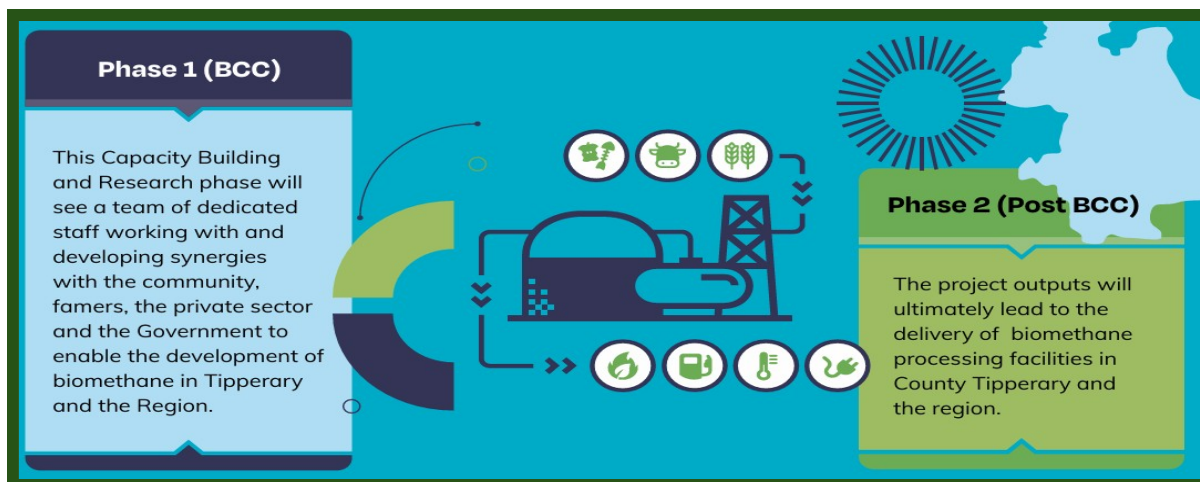
## Frequently Asked Questions (FAQs) and Answers for Communities

# Biomethane Development Office

This document provides answers to common questions related to Biomethane sector, primarily focusing on the National Bioeconomy Campus at Lisheen, Tipperary County, as well as the Just Transition Fund area and the Decarbonising Zone in Tipperary. While many of these questions and answers are general in nature, they are designed to help communities gain a clearer understanding of the biomethane sector, dispelling common myths and highlighting the potential benefits.

The aim of this work is to support local communities by providing factual, transparent, and accessible information about biomethane and its role in Ireland's energy transition. By fostering awareness and engagement, this document seeks to illustrate how biomethane can contribute to Ireland's ambitious climate action goals for 2030, while also driving sustainable economic opportunities at the regional level.

**A brief introduction of Biomethane Development Office:** The Biomethane Development Office (BDO) is a key initiative under the "Biomethane for Carbon and Community" (BCC) project, co-funded by the Government of Ireland and the EU Just Transition Fund (2021-2027). The BCC project is a collaborative project involving Tipperary County Council and its partners, the Technological University of the Shannon, the Irish Bioeconomy Foundation and the Tipperary Energy Agency. The BDO aims to drive biomethane development and decarbonisation efforts across Ireland, particularly in the Tipperary



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### **INTRODUCTION OF NATIONAL BIOECONOMY CAMPUS:**

The National Bioeconomy Campus at Lisheen, Tipperary, is a flagship initiative in Ireland's transition to a sustainable, circular economy. Located in the heart of the Just Transition Fund area and the Decarbonising Zone in Tipperary, the campus serves as a hub for innovation, research, and industry collaboration in the bioeconomy sector.

The campus focuses on advancing biomethane production, renewable energy, and bio-based industries, promoting the efficient use of natural resources while reducing environmental impact. It brings together research institutions, businesses, and policymakers to develop sustainable solutions that support Ireland's climate action goals and energy transition strategy for 2030.

By fostering new technologies, investment, and job creation, the National Bioeconomy Campus plays a crucial role in Ireland's journey toward a low-carbon, resource-efficient future, benefiting both the local economy and the wider national energy landscape.

## **National Bioeconomy Campus, Lisheen**



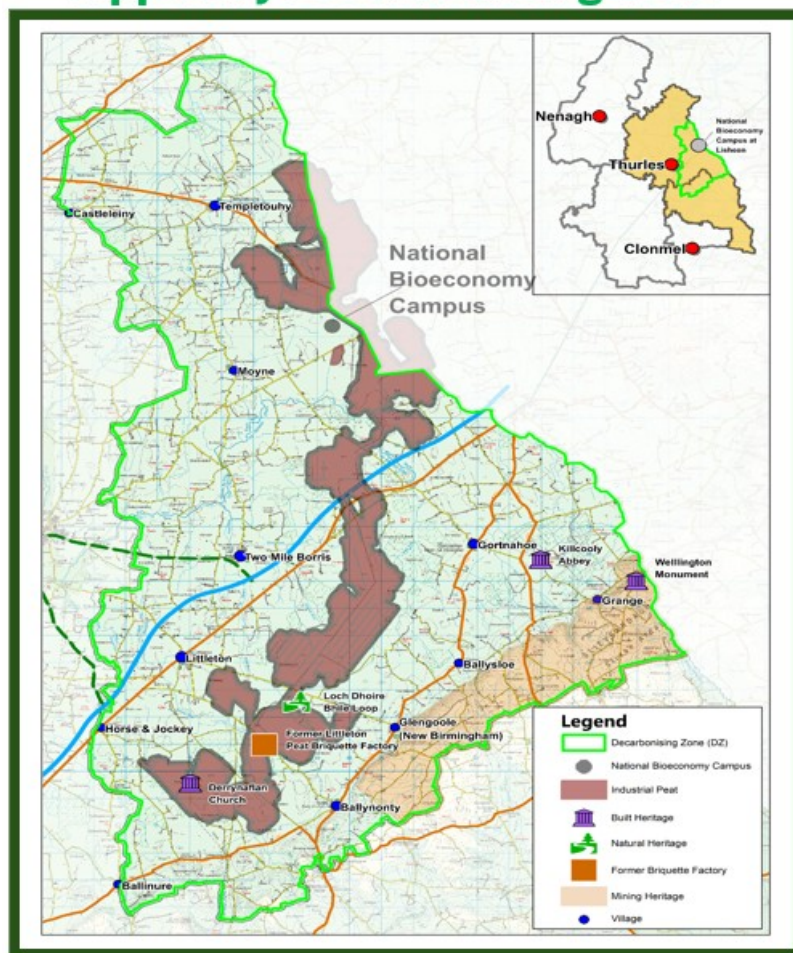
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### INTRODUCTION TO THE DECARBONISING ZONE IN TIPPERARY:

The Decarbonising Zone (DZ) in Tipperary is a designated area committed to reducing greenhouse gas emissions and accelerating the transition to a low-carbon economy. As part of Ireland's national climate action strategy, Tipperary's DZ focuses on implementing innovative solutions in renewable energy, energy efficiency, and sustainable resource management to meet the country's 2030 climate targets. It brings together local authorities, businesses, researchers, and communities to create a model for sustainable development that can be replicated across Ireland. By fostering clean energy solutions, circular economy practices, and green job opportunities, the Tipperary Decarbonising Zone is at the forefront of Ireland's efforts to achieve net-zero emissions, supporting both regional and national sustainability goals.

## Tipperary Decarbonising Zone





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## **Frequently Asked Questions (FAQs) and Answers for Communities**

# **General Questions and Answers related to Biomethane Sector**

## **Farming Perspective**

### **1. Food vs fuel: Will land use for energy crops threaten our food security?**

No, Ireland's biomethane strategy does not take away land from food production. Here's why:

- a) **Priority on waste (Bioresources), not crops:** Biomethane production in Ireland mainly uses slurry, manure, straw, food waste, and other farm residues. This means valuable land for food production remains unchanged.
- b) **Silage for biomethane can be grown in addition to food crops:** Farmers can produce extra grass silage for anaerobic digestion (AD) without reducing food production. Teagasc recommends this approach rather than shifting land away from food or livestock farming.
- c) **Supports a circular economy:** By using farm and food waste, AD helps reduce emissions, improve nutrient recycling, and lower reliance on chemical fertilisers. This benefits the environment while supporting productive farming.
- d) **Keeps Irish farms competitive:** Producing biomethane alongside food ensures farmers have extra income while maintaining food production, making agriculture more financially and environmentally sustainable.

**Bottom Line:** Ireland's Biomethane Strategy and plans are designed to protect food security by using waste and surplus grass rather than replacing food crops. Farmers can benefit from new income sources while keeping their land productive for food and livestock.

### **2. Will farmers get a substantial income from supplying feedstocks? How much will they get?**

Yes, farmers can earn substantial income from supplying feedstocks to anaerobic digestion (AD) plants. Here's how it works:

- a) **Payments vary by project and contract:** The exact payment farmers will receive depends on the terms of the contract with the AD developer. Generally, farmers can earn money for supplying grass, crops, slurry, or food waste.

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- b) **Digestate as part of the deal:** Some developers might offer digestate (the leftover material after anaerobic digestion) in exchange for slurry or to help reduce fertiliser costs on your farm. Digestate is a valuable fertiliser that can reduce the need to buy expensive synthetic fertilisers and help with nitrate management.
- c) **Higher value for consistent, year-round supply:** If you can supply feedstocks consistently throughout the year, you'll likely receive higher payments because AD plants need a steady, reliable supply.
- d) **SEAI estimates:** According to the Sustainable Energy Authority of Ireland (SEAI), by 2050, grass silage prices could increase by 20%, reaching around €36 per ton. Additionally, the price of food waste could drop from €50 to €40 per ton, potentially making it more profitable for farmers to supply these feedstocks.

### **3. Will digestate save a farmer from needing more slurry storage capacity?**

Digestate can help reduce a farmer's slurry storage needs in several ways:

- a) **Easier to manage:** The digested slurry (called digestate) can be separated into a liquid and a solid. The solid part takes up less space and can be stored separately or even sold as fertiliser.
- b) **Easier to manage:** The digested slurry (called digestate) can be separated into a liquid and a solid. The solid part takes up less space and can be stored separately or even sold as fertiliser.
- c) **Can be spread more often:** Digestate smells less and has nutrients that plants can use straight away. Since it's easier to handle and spreads better, you might be able to apply it more often, reducing the amount you need to store.
- d) **Might help with regulations:** New rules are making slurry storage tougher. If you're using a digester, you might not need to build as much extra storage, which saves money.

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## **Frequently Asked Questions (FAQs) and Answers for Communities**

### **4. Is digestate as good as slurry or synthetic fertiliser?**

Yes, and in many ways, it can be even better! Here's why:

- a) **Keeps nutrients on the farm:** Digestate contains valuable nutrients like nitrogen (N), phosphorus (P), and potassium (K), just like slurry and chemical fertilisers. However, because it has already been processed in the digester, the nutrients are in a form that crops can absorb more easily.
- b) **Reduces need for synthetic fertiliser:** Since digestate provides key nutrients, farmers can reduce their use of expensive chemical fertilisers, leading to cost savings and better soil health over time.
- c) **Helps with nitrogen limits:** Ireland has strict limits on nitrogen application to prevent water pollution. Digestate contains more plant-available nitrogen than raw slurry, meaning farmers can use it more efficiently while staying within regulations.
- d) **Better for spreading:** Unlike raw slurry, digestate has fewer odors and can be spread using [low-emission spreading techniques](#). This reduces nitrogen losses to the air and makes it more effective for crops.
- e) **Improves soil health:** Digestate adds organic matter to the soil, improving soil structure, water retention, and microbial activity, which helps crops grow better in the long run.

So, while digestate isn't exactly the same as slurry or synthetic fertiliser, it's a great alternative that saves money, improves efficiency, and helps meet environmental rules.

### **5. Is payment for feedstocks a guaranteed and reliable income in the long term?**

It can be, but it depends on a few key factors. Here's what you need to know:

- a) **Long-term contracts provide stability:** Most anaerobic digestion (AD) and biomethane plant developers want farmers to sign 10–20-year supply contracts. This means a steady and predictable income for supplying feedstocks like grass silage, slurry, or food waste.
- b) **What you get paid depends on your feedstock:** Different feedstocks have different values. High-energy crops (like silage) generally earn more than lower-energy materials (like slurry).

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Consistency matters too—if you can supply feedstock year-round, you’re likely to get a better deal than seasonal suppliers.

- c) **Farmers can also benefit from digestate return:** Many AD operators will offer farmers digestate (the leftover fertiliser) as part of the deal. This reduces fertiliser costs and adds value beyond just cash payments.
- d) **Market conditions may change:** While long-term contracts offer security, prices for feedstocks can still be influenced by demand, policy changes, and market prices. A well-negotiated contract can help protect against price drops.
- e) **Potential for additional revenue:** Some farmers may also be able to partner with AD plants rather than just selling feedstock. This could include profit-sharing or co-ownership models, offering another income stream.

**Bottom Line:** Signing a feedstock contract with an AD plant can provide reliable income, but it’s important to understand the terms, negotiate a good price, and consider the long-term benefits of digestate.

## **6. Why do so many farmers need to get involved?**

To make biomethane production work, many farmers need to supply feedstocks because setting up the plants and equipment is a big investment. Here’s why:

- a) **High initial costs:** Building a biomethane plant costs a lot, with equipment alone costing around €3 million and setting up the whole plant costing over €15 million.
- b) **Economies of scale:** To be competitive with fossil natural gas, the plant needs to operate at near full capacity most of the time. This means the plant needs to process large amounts of feedstocks (like slurry, grass, food waste, etc.) consistently to keep it running efficiently and profitably.
- c) **Size of the plant:** Most plants aim to produce around 40 GWh of biomethane per year, which requires a steady, reliable supply of feedstocks.

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- d) **Multiple farms needed:** Since a single farm can't supply enough feedstocks on its own, up to 100 farms may be needed to provide the right amount and variety of materials to keep the plant running. The more farmers involved, the more stable and reliable the feedstock supply becomes.

**Bottom Line:** A large number of farmers need to be involved to make the biomethane plants work effectively, as these plants need a consistent, large supply of feedstocks to operate at full capacity and compete with fossil fuels. This gives farmers a chance to earn income while supporting sustainable energy production.

## **7. Why should I (a farmer) get involved?**

There are many reasons why getting involved in biomethane production could benefit your farm and Ireland's future. Here's why you should consider it:

- a) **Reduce emissions:** Biomethane cuts greenhouse gas emissions by over 80% compared to fossil gas, helping combat climate change.
- b) **Extra income:** Supply feedstocks (like slurry and crops) to biomethane plants for additional, stable income.
- c) **Solve slurry issues:** Biomethane production helps manage slurry and reduces fertiliser costs with nutrient-rich digestate.
- d) **Meet national targets:** Ireland has strict emission reduction targets; biomethane can help agriculture meet these and avoid penalties.
- e) **Sustainability:** Decarbonising farming sectors like beef and dairy ensures long-term viability and aligns with national sustainability goals.
- f) **Long-term contracts:** Secure long-term agreements with developers, offering stability and easing succession planning.
- g) **Renewable fuel:** Biomethane is renewable, space-efficient, and less visible than other energy sources like solar or wind.



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### **8. How will the plant continue to run in the summer if I only bring my cattle in for 6 months of the year? Will I be encouraged to house my cattle year-round to supply slurry?**

Biomethane plants need a steady supply of feedstocks to operate at full capacity. Here's how it works for farmers:

- a) **Consistent slurry supply:** Developers want the plant to run at maximum capacity year-round. If you only bring cattle in for part of the year, the plant might encourage you to provide slurry during the summer by offering premium payments or incentives. This helps keep the plant operating smoothly.
- b) **No need to house cattle year-round:** While developers may offer incentives to keep cattle indoors for a more consistent slurry supply, you are not required to house cattle year-round. However, balancing indoor and outdoor grazing with the feedstock supply is key to meeting plant needs without impacting the farming practices.
- c) **Flexibility with other feedstocks:** If housing cattle full-time isn't ideal for you, you can also supply other feedstocks, like grass silage or crop residues, to help meet summer demand.

### **9. Could digestate contaminate my land?**

No, digestate is safe to use on your land as long as it's properly processed:

- a) **Pasteurisation:** Digestate made from slurry collected from multiple farms will be pasteurised (heated to 70°C for 1 hour typically) to kill any harmful pathogens and prevent contamination.
- b) **Bord Bia approval:** After pasteurisation, Bord Bia approves the digestate for use, as long as it doesn't come from sewage or sewage sludge.
- c) **Farm-based digestate:** Digestate from farm-based anaerobic digestion systems, especially when fed with crops, is safe and can be directly applied to land as a fertiliser.

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### **10. Will biomethane still be needed in fifty years? What if we get our energy from hydrogen by then?**

From an Irish farmer's perspective, biomethane will still be important for the long term, even if hydrogen becomes more common:

- a) **Biomethane's role in the gas grid:** The existing gas network can handle some hydrogen, but biomethane can fully replace natural gas in the pipeline, making it a crucial part of Ireland's energy mix for years to come.
- b) **Supporting hydrogen:** As hydrogen develops, it can work alongside biomethane. For example, e-methane (made by combining hydrogen with carbon dioxide) can be produced, meaning biomethane and hydrogen will complement each other rather than replace one another.
- c) **Stable income for farmers:** Biomethane can also be used for industries that need high-temperature heating or heavy vehicle fuel. This creates steady demand for farm feedstocks, which gives farmers a reliable income from supplying slurry, crops, or other materials for biogas/ biomethane plants.
- d) **Long-term sustainability:** Biomethane production helps reduce waste, manage slurry, and provide a renewable energy option, making it part of a sustainable farming future.

### **11. Will farmers need to build digestate storage tanks?**

- a) It depends on the agreement with the AD plant developer. Some developers may store and manage digestate, while others may require farmers to have on-farm storage.
- b) Farmers using digestate as fertiliser will likely need enough storage to comply with slurry storage regulations.

### **12. Will the developer store the digestate fertiliser until the farmer needs it?**

This varies by project. Some AD developers provide storage and deliver digestate when needed, while others may require farmers to collect and store it themselves. Check the agreement details to understand who is responsible for storage and logistics.

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### **13. What are the regulations around digestate spreading (seasonal windows, etc.)?**

Digestate is subject to Ireland's Nitrates Directive, similar to slurry. There are closed periods when spreading is not allowed (typically mid-October to mid-January, depending on location).

### **14. What will happen feedstocks in the Summer when slurry collection is low?**

Biomethane plant developers must operate their facilities close to maximum capacity year-round to maintain sustainable profits. Slurry will be a primary feedstock, requiring a consistent supply. During the summer, when slurry availability is low due to livestock grazing, AD plants will rely more on grass silage, which is typically stored in advance. Some developers may build large slurry storage tanks to retain supplies from winter and spring, ensuring a consistent feedstock supply. Farmers supplying slurry may need to adjust storage and management practices or consider housing animals for longer periods. Alternative feedstocks like crop residues, poultry manure, and food by-products may also be used to maintain production. Farmers should plan ahead and coordinate with AD plants to ensure a steady feedstock supply year-round.

### **15. Will these plants be the same as the AD plants in Northern Ireland?**

Not quite. There are several AD plants in Northern Ireland which are smaller in scale than the proposed biomethane plants. These AD plants produce biogas from anaerobic digestion which is burned on site to generate electricity and heat (sometimes called combined heat and power or CHP). While this is useful, biomethane plants will help us to decarbonise industrial heating and/or heavy transport fuel by refining the biogas produced by AD to a purer fuel practically identical to natural gas. Biomethane plants will generally be much larger than the biogas plants in Northern Ireland.

## Frequently Asked Questions (FAQs) and Answers for Communities

### Operational & Logistical Perspective

#### 16. Will there be extra traffic on the roads?

Yes. Feedstocks are typically delivered daily to biomethane plants, while digestate is removed. Vehicle movements depend on whether biomethane is injected into the local gas grid or transported by trailer to the nearest injection point, particularly when the pipeline is over 5 km away. These trips will involve heavy goods vehicles (HGVs), not tractors.

To prevent dirt on the roads, wheel washes will be used at the plants. At Lisheen, traffic levels are expected to be lower than during the mine's operation. Traffic management plans are required during the planning process, outlining daily journey expectations. Transportation distances will be minimised to optimise logistics and reduce fuel use, with feedstocks typically sourced from within 10 km of the plant, especially for heavier materials like slurry.

#### 17. How is the location for the plant selected?

The selection of sites for biomethane plants is based on several factors. Some of them are:

- a) **Close to feedstock supply:** The plant should be near farms and food processing units to reduce transport costs for slurry, manure, and other organic materials.
- b) **Near gas pipelines:** A location close to the natural gas network makes it easier and cheaper to inject biomethane into the grid.
- c) **Good road access:** Wide roads and easy access are important for trucks delivering feedstock and transporting digestate back to farms.
- d) **Suitable land conditions:** A flat, stable site is preferred to simplify construction and operations.
- e) **Minimal neighbor impact:** Plants are typically placed in rural or industrial areas to avoid issues like odor complaints and heavy traffic near homes.



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### **18. Will there be mud on the roads from feedstock collections?**

Biomethane plants will typically be clean industrial areas with no mud and will often require wheel wash facilities. It is expected that feedstock collections and digestate deliveries will be by Heavy Goods Vehicles (HGVs) rather than tractors and will need to take place at clean areas on farms.

### **19. What is the Danish model for biomethane production?**

The Danish model is a successful approach to biomethane production that brings farmers, industry, and the government together to make renewable gas a key part of the energy system.

- a) **Agriculture-based feedstocks:** The model relies heavily on animal slurry and manure as primary feedstocks. This helps reduce farm emissions and creates an extra revenue stream for farmers.
- b) **Farmer-led cooperatives:** Farmers own and supply the plants with agricultural waste (Bioresources), ensuring that they benefit directly from biomethane production.
- c) **Large, centralised biogas plants:** Instead of many small plants, Denmark uses large-scale biomethane facilities that process feedstock from multiple farms. This lowers costs and increases efficiency through economies of scale.
- d) **Strong government support:** The Danish government provides long-term policies, subsidies, and stable prices for biomethane to encourage investment and farmer participation.
- e) **High biomethane contribution to gas supply:** Denmark's gas supply contains a biomethane blend of roughly 40%, making it a global leader in renewable gas integration.
- f) **Rapid growth of biogas industry:** The production of biogas in Denmark has increased rapidly over the past decade, with around 150 biogas plants currently operating.
- g) **Diverse feedstocks:** While livestock waste is the primary input, a range of other biomasses such as food waste, crop residues, and energy crops—is also used to produce biogas.

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## **Frequently Asked Questions (FAQs) and Answers for Communities**

### **20. What biogas/biomethane projects are in operation in Ireland and how can I find out about them?**

A company called **Green Generation** operates a biomethane production facility in Nurney, Co. Kildare. Recently, this plant went into receivership recently citing the reasons related to policy and import prices.

**Bia Energy** operates a large biogas plant in Dublin and is adding biogas upgrading equipment to produce biomethane. There are many unsubsidised biomethane plants operating in the UK, Denmark and Germany.

European company, **CycleØ**, recently announced its €100m plans to build and operate four new biogas plants in Ireland, at sites in Kildare, Cavan, Galway and Limerick. These plants are expected to generate a total of 160GWh of biomethane annually between them, enough to heat over 12,000 Irish homes for a year.

Renewable energy company **Nepht Renewable Gas (NRG)**, headquartered in Tipperary has announced the signing of a memorandum of understanding (MoU) with Gas Networks Ireland. Nepht formally lodged its first planning application with Mayo County Council to develop an anaerobic digestion (AD) facility at a site in Ballinrobe. The company intends to develop a number of similar facilities across the country.

**Greengate Biogas** plans to build seven 600,000-tonne AD plants across Ireland. Greengate Biogas, will develop, construct and operate biogas plants across Ireland with a primary focus on using manure.

**Teagasc Grange AD plant** at Co. Meath has been commissioned and is producing small amount of biogas. The Biomethane plant is expected to be completed by the end of 2025.

Several developers are planning biomethane plants for Ireland: 18 projects were awarded capital grants from the government last year.

One can find information on these in newspapers, online and at community information events.

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## **Frequently Asked Questions (FAQs) and Answers for Communities**

### **21. Licencing - who will do it and how will it be monitored?**

The National Biomethane Strategy plans to establish a Biomethane Sustainability Charter to prevent unintended consequences, which will be included in biomethane certification. Biomethane projects must secure planning permission and licenses from the Department of Agriculture, Food and the Marine (DAFM), the Department of Environment, Climate and Communications (DECC), the Environmental Protection Agency (EPA), the Local Authority, or An Bord Pleanála.

Biomethane plants require either a waste permit from the Local Authority or a waste or industrial emissions license from the EPA. The specific license needed will depend on the type of feedstocks and waste being processed in the digester.

### **22. Are there guidelines regarding the minimum distance between biomethane plants and dwellings?**

No specific minimum distances have been set out for distances between biomethane plants and houses. Plants will typically be located in the countryside and decisions to grant planning permission will consider proximity to houses in the suitability of the projects.

### **23. What are the operating hours of biomethane plants?**

Biomethane plants run 24/7, all year round. The process of anaerobic digestion (AD) works continuously to break down organic material and produce biogas.

However, the day-to-day operations involve:

- Regular monitoring to ensure everything is running smoothly.
- Daily feeding of the digester with slurry, manure, or other organic materials.
- Routine maintenance to keep equipment in good condition.

Most plants have automated systems that reduce manual work, but staff are needed for monitoring, maintenance, and occasional adjustments. For farmers supplying feedstock, the plant will have set delivery times, but the biomethane production itself never stops.

## **Frequently Asked Questions (FAQs) and Answers for Communities**

### **24. How much noise do biomethane plants make?**

Typically, biomethane plants make very little noise. Anaerobic digestors are silent, only requiring stirring. Pumps and compressors will operate, and movement of vehicles will take place on site. Soundproofing measures will be put in place to minimise noise.

### **25. What benefits will biomethane plants bring to local communities?**

Biomethane plants bring multiple benefits to local communities, especially for farmers and rural areas:

- a) **New income for farmers:** Farmers can earn by supplying slurry, manure, and other organic materials to the plant. Some may also receive digestate (a nutrient-rich fertiliser) in return.
- b) **Job creation:** Plants create local jobs in construction, operation, and maintenance, boosting the rural economy.
- c) **Better waste management:** Animal slurry and food waste are turned into valuable energy instead of being left to decompose and release methane into the air.
- d) **Cleaner air & water:** Biomethane production reduces farm emissions, cuts down on odors, and helps prevent water pollution from slurry runoff.
- e) **Reliable local energy:** The gas produced can power homes, businesses, and transport, reducing dependence on fossil fuels.
- f) **Support for rural development:** Biomethane plants encourage investment in infrastructure, such as better roads and transport links.

### **26. Will plants strain the local water supply?**

The quantity of water required by plants will typically be relatively small and not seen as an issue, as most of the water can be recycled in the anaerobic digestion process. Quantities of water demand will vary between projects and should be considered by the local authority during the planning process.



## **Frequently Asked Questions (FAQs) and Answers for Communities**

### **Financial Perspective**

#### **27. Will biomethane only be sold to large multinational companies?**

Biomethane production currently costs more than natural gas, leading it to be primarily purchased by large companies willing to pay a ‘green premium’ to reduce their carbon footprint. As the sector evolves, production costs are expected to decrease, making biomethane more accessible to a broader customer base. Due to recent price volatility in imported natural gas, the relevance of the green premium may fluctuate. Gas utilities and transport fuel companies are likely to be key buyers of biomethane. To support this market, the government is expected to introduce a Renewable Heat Obligation (RHO) in near term, requiring gas suppliers to blend a minimum percentage of renewable gas into their supply, aiming for an increase to 10% by 2030.

#### **28. Will all the profits go to foreign investors?**

Biomethane plants will create local jobs and profits, boosting the rural economy, and typically have community funds. Where company profits go depends on the developer. The Biomethane for Carbon and Community project is researching co-operative ownership models for biomethane plants, which would mean biomethane company revenues would stay in the Irish economy, instead of being used for fuel imports.

#### **29. Will biomethane plants create much employment?**

The National Biomethane Strategy estimates that constructing and operating anaerobic digestion (AD) plants in Ireland could generate around 2,700 jobs in the rural economy. This includes an estimated 0.44 jobs per gigawatt-hour (GWh) of biomethane. The European Biogas Association reports a weighted average of 0.32 direct jobs and 0.77 indirect jobs per GWh. For a standard 40 GWh plant, this translates to approximately 13 direct jobs and 31 indirect jobs, covering roles such as plant operators, management teams, and construction workers. The Biomethane Implementation Group, formed under the strategy, will develop training programs to prepare the workforce for these roles.

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## **Frequently Asked Questions (FAQs) and Answers for Communities**

### **30. Are plants financially sustainable?**

Yes, biomethane plants can be financially sustainable if designed properly. Many European plants operate profitably without subsidies, and Ireland has the potential for similar success. Advances in technology are improving process efficiencies and increasing the value of co-products. The Irish government has allocated capital grants to 18 biomethane projects to help grow the industry, and the upcoming Renewable Heat Obligation (RHO) will create a stable market for biomethane, supporting its long-term viability. However, it is important for the government to address the challenges posed by cheap imports and fraudulent practices to ensure a fair and subsidised ecosystem for local developers. With the right conditions, biomethane can contribute to Ireland's decarbonisation efforts and become a sustainable energy source.

### **31. Will a biomethane plant impact my property value?**

A nearby biomethane plant is unlikely to impact your property value. These plants typically occupy about 10 acres for a 40 GWh capacity and consist of several tanks, shed-like buildings, and an office. The facilities include sheds up to 16 meters high, digestate storage tanks and digester tanks around 15 meters, pasteurisation tanks about 6 meters tall, and an 11-meter biogas flare.

Landscaping with trees and hedgerows is common to reduce visibility. Vibrations, noise, and odors are expected to be very minimal, as plants utilise odor treatment units. Steam and smoke emissions are not expected, and biogas flares are only activated at high pressures. Unless a combined heat and power plant is on-site, significant fuel combustion will not occur. While trucks will increase local traffic, wheel washes will minimise dirt and contaminants on the roads.

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## **Frequently Asked Questions (FAQs) and Answers for Communities**

# **Environmental, Scientific and Safety Perspective**

### **32. How will biomethane plants impact biodiversity?**

The use of biomethane as a replacement for fossil fuels will help to reduce Ireland's greenhouse gas emissions, which will help to minimise the impacts of climate change and as a result, minimise the major harmful effects on biodiversity, and reduce the likelihood of droughts, floods, extreme weather conditions, etc. Biomethane produced will need to emit at least 80% less greenhouse gases than the fuel it replaces to comply with EU renewable energy directives. On a local level, applying anaerobic digestate to land instead of synthetic fertiliser and slurry will help to reduce the pollution of waterways caused by run-offs.

### **33. Could digestate pollute rivers?**

It is important to prevent digestate runoff into waterways. Since digestate is usually pasteurised, it poses less risk to water quality compared to synthetic fertilisers. The nutrient levels in digestate vary depending on the feedstocks used, and a well-operated anaerobic digestion system can minimise nutrient remnants. The remaining nutrients are typically in forms readily available for crop absorption.

The nitrogen content depends on the feedstock; nitrogen-rich feedstocks like manures yield digestate high in ammonium, which plants absorb easily. This reduces the risk of runoff and nitrification of waterways.

### **34. Is there a risk of explosion?**

Yes, methane is flammable, similar to natural gas, oil, or petrol, but biomethane plants are designed with strict safety measures to prevent accidents. The gas is pressurised, like the natural gas already in pipelines across Ireland, and the plants use advanced engineering to ensure safety. In case of a malfunction or pressure surge, biomethane plants are equipped with safety flares that burn off excess gas to reduce the risk of explosion. These safety protocols are in place to ensure that biomethane production is safe for local communities and workers.

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## **Frequently Asked Questions (FAQs) and Answers for Communities**

### **35. Will the plant and feedstock collection trucks smell?**

Biomethane plants and feedstock collection trucks are designed to minimise odors. The feedstock used in biomethane production is usually organic material, such as slurry or crop waste (Bioresources), which can have a natural smell. However, modern biomethane plants use closed systems for digestion, which reduces odor emissions. Trucks collecting feedstock are also equipped with covered containers to limit smells during transport. While some odor may be present, it is typically well-managed, and any potential impact on local areas is minimised through proper management practices.

### **36. Will methane leak cause extra greenhouse gas emissions?**

Methane leaks can potentially contribute to greenhouse gas emissions, but modern biomethane plants are designed with strict safety measures to prevent leaks. The equipment used in biomethane production, storage, and transport is carefully engineered to minimise the risk of methane escaping into the atmosphere. Additionally, any methane that is accidentally released is typically captured and burned off in safety flares to prevent harmful emissions.

### **37. What will happen to the CO<sub>2</sub> separated from the biomethane?**

The CO<sub>2</sub> separated from biomethane during production can be captured and either stored or utilised in various industries through Carbon Capture, Utilisation, and Storage (CCUS). The captured CO<sub>2</sub> can be converted into chemicals, fuels, and building materials, or directly used in applications such as refrigeration (liquefied CO<sub>2</sub>), biomass production (algae), and in food and beverage industries (as a carbonating agent). Additionally, CO<sub>2</sub> can be stored underground in carbon sequestration technologies to prevent its release into the atmosphere. Another potential use is synthesising CO<sub>2</sub> with hydrogen to produce e-methanol, ethanol, or sustainable aviation fuel (SAF). These processes help to reduce the carbon footprint of biomethane production and support Ireland's climate change mitigation efforts.



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## **Frequently Asked Questions (FAQs) and Answers for Communities**

### **38. Are there harmful trace elements in biomethane?**

Biomethane produced from agricultural feedstocks is generally very clean, with very few harmful trace elements. During the production process, impurities such as hydrogen sulfide (H<sub>2</sub>S) may be present in the biogas, but these are removed before the gas is upgraded to biomethane. This ensures that the final product, which is injected into the gas grid or used as fuel, is of high quality and safe for use without causing harm to the environment or equipment. Regular monitoring and filtering systems in biomethane plants are in place to ensure the gas meets stringent safety and quality standards.

### **39. If biomethane is roughly 97% methane, what is the other 3% composed of?**

The other 3% of biomethane typically consists of small amounts of impurities, including:

- a) **Carbon Dioxide (CO<sub>2</sub>):** A small percentage of CO<sub>2</sub> may remain after the upgrading process.
- b) **Nitrogen:** Sometimes N<sub>2</sub> is present, especially if air has been used in the production process.
- c) **Hydrogen Sulfide (H<sub>2</sub>S):** A trace amount may be present, but it is usually removed during the upgrading process.
- d) **Oxygen:** A small amount of oxygen may be present, depending on the production method.
- e) **Water Vapor:** Depending on the production process, a small amount of vapor may remain.

### **40. What is done with wastewater from biomethane plants? Could local water supplies be contaminated?**

The water used in an anaerobic digestion system can be reused, eliminating disposal needs. This sustainable waste management solution may require EPA licenses for wastewater, depending on feedstocks. Waste from the plant undergoes rigorous testing to prevent environmental impacts.

Biogas and biomethane plants are established and reliable. They must provide detailed environmental impact reports before construction to ensure no significant harm occurs. Slurries stored on-site are contained in impermeable tanks, and the areas around anaerobic digesters are enclosed in concrete and raised bunds to prevent feedstock runoff and soil or groundwater contamination.

## **Frequently Asked Questions (FAQs) and Answers for Communities**

### **41. Could digestate emit methane to the atmosphere if the microbes are still active?**

Generally, the microbes which produce methane during anaerobic digestion are deactivated in aerobic environments (environments containing oxygen), stopping methane production. But, yes, digestate can emit methane if the microbes are still active. Digestate is the solid by-product left after the anaerobic digestion (AD) process, and it contains organic matter that can still be broken down by microbes. If this material is not properly managed or stored, microbes can continue to break down the organic matter and produce methane.

To prevent this, digestate should be properly stored or treated. This can include drying or composting the digestate, which helps to stop the microbial activity and reduce the risk of methane emissions. Proper management of digestate not only helps prevent methane emissions but also makes it easier to use as a valuable fertiliser or soil conditioner.

### **42. Will biomethane plants attract vermin?**

Food waste and crops can attract vermin. Careful management of feedstocks stores and pest control at plants can prevent vermin infestations. The processing of these feedstocks in anaerobic digestion makes them less attractive to vermin.

### **43. Can biomethane be carbon negative and what does this mean?**

Yes. Biomethane can be carbon negative, removing or preventing more greenhouse gases (GHGs) than it produces. This helps mitigate global warming. Using waste materials, such as cattle slurry and food waste, for biomethane production plays a crucial role. Cattle slurry emits methane when decomposed, but by digesting it in a closed tank, we can produce biomethane, releasing carbon dioxide instead, which has a lower global warming potential.

Similarly, utilising food waste prevents methane emissions from landfills. During the anaerobic digestion process, biogas is refined to produce biomethane, with a significant amount of carbon dioxide separated out. This captured carbon dioxide can be stored or used, contributing to negative emissions.

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## **Frequently Asked Questions (FAQs) and Answers for Communities**

### **44. How much potential does biomethane have to decarbonise Ireland's energy use?**

According to Gas Networks Ireland's Biomethane Energy Report released in September 2023, Ireland has the potential for 14.8 TWh/a of biomethane production. This represents 2.6 times the 2030 target of 5.7 TWh, meaning 26% of Ireland's current natural gas demand could be replaced and decarbonised by biomethane use. The financial impact of this would be felt in the form of a boost to the rural economy replacing spending on natural gas imports.

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**Prepared By**

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