



Rialtas na hÉireann
Government of Ireland

Ireland's National Biomethane Strategy

May 2024

Prepared by the Department of Agriculture, Food and the Marine in
partnership with the Department of Environment, Climate and
Communications

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Minister's Foreword – Minister for Agriculture, Food and the Marine

I am pleased to provide you with Ireland's new National Biomethane Strategy, which was developed and co-led by my department, alongside the Department of Environment, Climate and Communications.

Ireland is recognised as having one of the largest potentials for biomethane production in Europe per capita, due to Ireland's substantial agricultural sector. This strategy is first and foremost an agri-centric strategy, with the objective of enabling farmers to contribute to the decarbonisation of Ireland's energy system. Farmers are key stakeholders who have a vital role to play in upscaling the biomethane industry in Ireland. Without farmers, the industry will not develop at the required scale. My department and the government want nothing more than to see the industry grow and flourish in the time ahead.

Setting out strategic policy direction and guidance for the biomethane industry, this Strategy maps an important way forward for the development of an Anaerobic Digestion (AD) industry of scale. In doing so, it addresses the key challenges and opportunities for the Biomethane industry. Moreover, it identifies actionable recommendations intended to guide the industry while providing clear direction, considering economic, social, environmental benefits and risks.

While the AD industry in Ireland is at a nascent stage of development, I believe that collectively, we have an opportunity to build out an AD industry of scale to produce the 2030 Government target of up to 5.7 Terawatt hours (TWh) of indigenously produced biomethane. In this strategy, example was taken from the rest of Europe, where biomethane is well established, and where agricultural biomethane plants make up the largest share of biomethane production. The environmental and economic benefits of AD cannot be overlooked. AD will provide significant opportunities for farmers in the context of income diversification and viable land use alternatives.

The National Heat Study demonstrates capacity within the agriculture sector to provide a variety of feedstocks for AD including grass, grass silage and the use of animal manures. All of this can be done without compromising food security, while respecting and enhancing the natural environment.

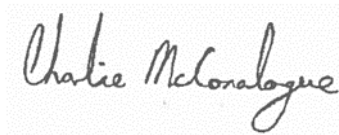
The sizeable response rate to the public consultation conducted as part of this strategy formation demonstrates the high level of interest stakeholders have in the development of a

sustainable Biomethane Industry in Ireland. Feedback received from this public consultation directly informed the final strategy. This strategy also includes the findings of comprehensive consultations with industry experts, informing our collective vision to grow the industry and meet our climate targets, resulting in several benefits across a range of sectors.

Achieving our vision will require all stakeholders in the industry to work together.

I acknowledge and thank the members of the Biomethane Working Group and all the stakeholders who participated in the development of this Strategy.

I am hugely optimistic about the direction and the potential of Biomethane production over the next decade and beyond. I look forward to engaging with all stakeholders to make this Strategy a success, and to reflecting in 2030 on a thriving agri-centric sustainable biomethane industry, delivering the full range of benefits that AD has to offer.

A handwritten signature in dark ink, reading "Charlie McConalogue". The signature is written in a cursive style with a large initial 'C'.

Charlie Mc Conalogue T.D.

Minister for Agriculture, Food and the Marine.



Minister's Foreword – Minister for Environment, Climate and Communications

The reduction of heat-related greenhouse emissions from the use of fossil fuels in our homes, businesses and industry is a significant priority for the Government of Ireland. Primarily due to economic growth, emissions from heating have risen from post-recession lows, and Ireland

continues to have an excessive dependence on fossil fuels for heating.

Through our strengthened climate legislation, the 2020 Programme for Government, and our annually updated Climate Action Plan, we have set ourselves the ambition of becoming carbon neutral by 2050. It is clear delivery will require a major ramp up in key decarbonisation activities across all sectors, and decarbonised gases like biomethane will play a key role in this transition.

Government has committed to the production of up to 5.7 TWh of indigenous biomethane by 2030 and this strategy sets out our vision for how this biomethane will be produced and used in Ireland, as well as the cross-government policy development required to enable the development of Ireland's anaerobic digestion and biomethane industry at scale. This target is a little over 10% of current usage of fossil gas, however this will rise to over 50% of our usage by the mid 2030's as we shift our economy away from gas in favour of electrification.

As we look to develop our renewable energy market, bioresource efficiency and sustainability must remain a key focus. By reducing our dependence on non-renewable unsustainable resources and managing our natural resources sustainably, we will avoid any potential competition with other critical uses of land, including food production and biodiversity protection. We must learn from the mistakes in other markets, where sustainability was not put at the core of biomethane production and ensure that the industry contributes to nature and water quality recovery.

The National Heat Study carried out extensive analysis of bioenergy resources in Ireland, identifying biomethane as a competitive, cost-efficient, path to decarbonising sectors with a high thermal heat demand. The production of this biomethane will not only facilitate the displacement of fossil fuels, reduce emissions in the heat sector and strengthen our energy security, it will also reduce emissions in our agriculture sector.

Using sustainably produced feedstocks including grass silage, animal slurries and food waste resources, we will increase our circular bioeconomy, helping to build resilience in our local biological resources, environment, economy, and society.

My commitment to introduce a renewable heat obligation in the heat sector in 2024 will incentivise suppliers of fossil fuels used for heat, to ensure a proportion of the energy they supply is renewable and will further support the development of the industry, and the delivery of the 5.7 TWh target.

Publication of this strategy, in partnership with the Minister for Agriculture, Food and Marine is a significant first step in supporting development of an accelerated biomethane market in Ireland. It is key to setting out an initial pathway to kick start the industry and will allow Ireland to harness the opportunities and rewards that will come from moving to a low-carbon society.

A handwritten signature in blue ink, appearing to read 'Eamon Ryan'.

Eamon Ryan TD

Minister for the Environment, Climate and Communications

Executive Summary

Government committed to the delivery of up to 5.7 TWh of indigenously produced biomethane by 2030. Delivery of this ambitious target will require the development of an AD industry at scale. A first key step is the development of a National Biomethane Strategy.

This National Biomethane Strategy was co-developed by the Department of Agriculture, Food and the Marine (DAFM) and the Department for Environment, Climate and Communications (DECC). Guidance was provided by a Project Working Group, chaired by DAFM, which drew on membership across Government, under the auspices of the Heat and Built Environment Task Force. Membership of the Working Group is included in the Appendix.

The National Biomethane Strategy is Ireland's first major policy statement on biomethane and is an important milestone in the development of an indigenous sector. The Strategy sets out twenty-five actions to be delivered in the coming years to enable the development of the sector. Along with providing supports and policy certainty, these actions aim to improve the development timeline and economics of projects in order to meet the 5.7 TWh target by 2030.

Mission, Vision, Values

The primary objective of the National Biomethane Strategy is to deliver on the ambitious target set by the Government as part of the agreement on the sectoral emission ceilings. The ambition is to scale up indigenously produced biomethane by up to 5.7 TWh per annum by 2030, which has been increased substantially from an original Climate Action Plan 2019 target of 1.6 TWh by 2030.

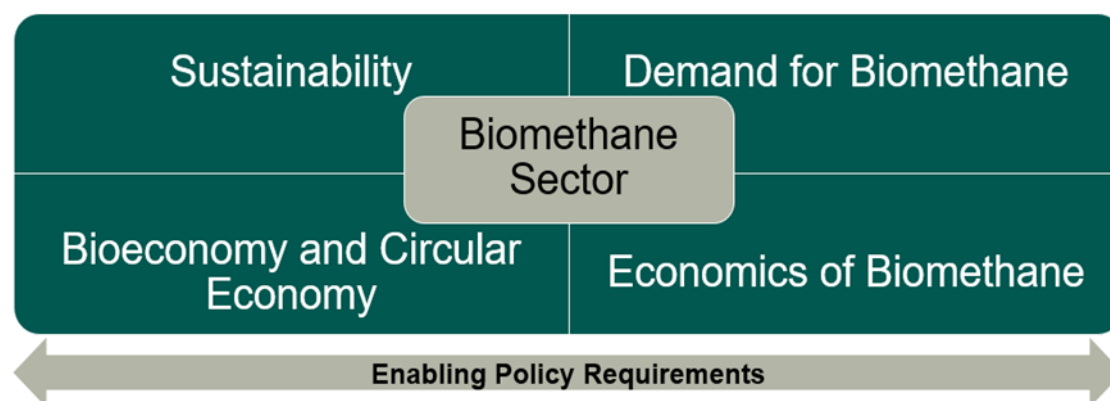
Mission: The National Biomethane Strategy will be agri-led and farmer-centric with a focus on the supply of suitable feedstocks, including animal slurries. It will align with the national biodiversity action plan, nitrates action plan, and contribute to the restoration of Ireland's biodiversity. It will align with the circular bioeconomy development contributing positively to both the sectoral emissions ceiling for agriculture, as well as to the decarbonisation of Ireland's energy mix.

Vision: By 2030, Ireland will have developed a sustainable biomethane industry of scale, meeting ambitious production targets set by the Government.

Values: Sustainability, Biodiversity, Diversification, Decarbonisation, Energy Security, Circular Economy and Bioeconomy.

Framework for developing the National Biomethane Strategy

The development of the National Biomethane Strategy focused on a framework of five key pillars. All these interlinking pillars were seen as critical to delivering a successful biomethane sector: Sustainability, Demand for Biomethane, Bioeconomy and Circular Economy, Economics of Biomethane and Enabling Policy Requirements.



Using these five key pillars, potential high-level scenarios were examined to determine the most credible pathway of delivering 5.7 TWh, while at the same time recognising key Strategy objectives of delivering a sustainable agri-centric biomethane industry.

This Strategy sets out the proposed funding approach from 2024-2030 along with policy and regulatory measures to be delivered across the next two years to swiftly mobilise the industry and remove any barriers that could inhibit sector development.

As the sector develops, further action will be required to build on these early actions. The Biomethane Implementation Group will work to monitor the delivery and impact of these initial measures and the identification of further actions to support overall target delivery. A full breakdown of the actions underpinning the delivery of the National Biomethane Strategy are included in the appendix to this Strategy.

Recommended approach to strategy delivery

Key pillar	Pillar description	Strategy ambition	Associated actions
Sustainability	Ensure biomethane is produced in an environmentally sustainable manner, having regard to established goals for the protection and restoration of water, soil, biodiversity, and ecosystem services,	Development of a Biomethane Sustainability Charter, implementation of the Renewable Energy Directive sustainability criteria and enhancing the training and	Actions 1a – 1d

	while availing of opportunities to pursue those goals as co-benefits of biomethane production.	education available to biomethane developers.	
Demand for Biomethane	Develop biomethane in Ireland for end uses which should include hard-to-abate sectors that currently have limited or no alternative options to decarbonise.	Strategy Implementation will encourage development of an indigenous biomethane sector and contribute towards the reduction of fossil gas use in industrial heat and transport sectors	Actions 2a – 2e
Bioeconomy and Circular Economy	Ensure that the biomethane strategy, bioeconomy and circular economy development are integrated.	Exploration of R&D opportunities to ensure that the full range of benefits of producing biomethane with other biobased products and biorefining are considered.	Actions 3a – 3d
Economics of Biomethane	Assessment of optimal deployment approaches, end use sectors where biomethane will be an economically viable option, agri-centric considerations, circular use of waste streams, scale of plant and grid connections.	Introduction of RHO and Capital Grants support scheme in 2024 Assessment of further support options post 2025	Actions 4a – 4c
Enabling Policy Requirements	To ensure timely development of a biomethane industry in Ireland, various enabling policies must be delivered, and current impediments	Development of a communications strategy to perceive positive messages in relation to AD and the benefits it can offer. Address any	Actions 5a – 5i

	addressed. (e.g. coordination, consultation, advisory, capacity building, grid, codes of practice, skills development).	potential bottlenecks to the development of an AD industry in Ireland.	
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Introduction to biomethane

Biogas is produced as the main product of the Anaerobic Digestion (AD) of biological feedstocks including food waste, sewage sludge and agricultural feedstocks. Agricultural feedstocks include but are not limited to materials such as animal manures and grass silage. The AD process produces biogas from feedstocks through decomposing of organic material by micro-organisms in large oxygen-free tanks. Biogas is typically comprised of 60% methane and 40% CO₂. It can be used locally for heat purposes or for combined heat and power production. Biogas can also be upgraded to sustainable biomethane to replace fossil gas. When biogas is upgraded to methane with greater than 97% purity, it is termed biomethane. Biomethane is fully compatible with the national gas network and existing appliances, technologies, and vehicles. It can seamlessly replace fossil gas to reduce emissions in heating, transport, and power generation.

Biomethane that satisfies the Renewable Energy Directive's life cycle sustainability criteria can be classified as "a zero-carbon rated fuel". Biomethane can therefore directly contribute to meeting Ireland's decarbonisation targets. Biomethane is already firmly established and available on the European market, with circa. 37 TWh produced in 2022. Biomethane has the potential to progressively replace fossil gas supplies at a national level as we substantially reduce our use of gas over the next 15 to 20 years.

The status of biomethane in Ireland

While biomethane production has been deployed across Europe at significant scale, it is at a nascent stage of development in Ireland. Currently, Ireland has only two operational biomethane facilities injecting biomethane into the gas grid. The volume of biomethane injected into the grid is small, equating to c. 75 GWh per annum, which is equivalent to 0.001% of Ireland's current gas demand. This biomethane is mainly generated from waste feedstocks. Currently, most biomethane produced in Ireland is utilised in the transport sector under the Renewable Transport Fuel Obligation. There are currently only around 100 HDVs capable of using Biomethane in use in Ireland.

According to the European Biogas Association¹, there are also 43 facilities in Ireland producing 580 GWh of biogas, in addition to the two biomethane facilities. This biogas is used in electricity generation and is not upgraded to biomethane. The feedstock for these anaerobic digestion plants varies from landfill waste, municipal solid waste, sewage waste, and animal slurries. These AD biogas plants could be upgraded to develop biomethane, which is seen as a more efficient² use of a bio-resource than electricity production when used to decarbonise hard-to-abate sectors.

Opportunity to learn from successful biomethane sectors operating in Europe

Ireland can take significant learnings from successful biomethane sectors across Europe. A literature review of European countries with operational biomethane sectors took place as part of the research for the Working Group to identify any key policies or trends Ireland could replicate and avoid mistakes made in other European Countries.

Key learnings from operating biomethane sectors across Europe	
Scale of AD Facilities	The average size of AD plants in Europe is 35 GWh.
Feedstock Mix	The main feedstocks utilised across Europe are agriculture feedstocks (64%), organic wastes (11%) and industrial wastes (11%).
Regulations and Policy	More than 75% of biomethane plants in Europe are grid connected with 9% not connected and 14% unknown.
Financial Supports	Development of a biomethane industry across Europe has been facilitated by the availability of financial supports at the nascent stage of development.
End uses of biomethane	Historically across Europe, AD was developed to produce biogas which in turn generated electricity. This is now seen as an expensive way to generate renewable electricity. There has been a shift across Europe to utilise limited bio-resources to generate biomethane and decarbonise high temperature heat, gas grids in general and the transport sector.
Sustainability	Across Europe there is a focus on increasing the overall sustainability of biomethane production through CO ₂ capture,

¹ European Biogas Association Statistical Review

² Biogas electricity generation is c. 40% efficient and is multiple times more expensive than renewables such as wind and solar. Biomethane for heat decarbonisation is at least 90% efficient and when used in hard-to-abate sectors is potentially the only available decarbonised solution currently economically available

	digestate processing and an increased focus on sustainable feedstocks. Sustainability criteria under the Renewable Energy Directive becomes more stringent for plants entering operation from 2026
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The need for biomethane in Ireland

Ireland is recognised by the European Commission as having one of the largest potentials for biomethane production in Europe on a per capita basis due to its substantial agriculture sector. The development of a new agri-centric biomethane industry can engender cross sectoral benefits for Ireland, some of which are highlighted below.

Without biomethane, Ireland is unlikely to meet its legally binding climate targets

The Climate Action and Low Carbon Development (Amendment) Act 2021 commits Ireland to 2030 and 2050 targets for reducing greenhouse gas emissions and provides the governance framework to ensure emissions stay on track. Ireland is now on a legally binding path to net-zero emissions no later than 2050, and to a 51% reduction in emissions by the end of this decade. In July 2022, DECC published a target of up to 5.7 TWh, 10% of national gas demand, to come from biomethane by 2030 as part of the Sectoral Emissions Ceilings. The Environmental Protection Agency (EPA) report³ released in July 2023 on Ireland's provisional 2022 emissions, highlights the urgency to deliver decarbonisation options for Ireland to meet its 2030 targets.

Biomethane helps reduce agriculture sector emissions

The 25% emission reduction between 2018 and 2025 required by Agriculture's Sectoral Emission Ceiling for the first carbon budget period is an extremely challenging target for the sector. Meeting this target will bring about significant change in the agriculture sector over the coming decade and will coincide with the adoption of constantly evolving scientific and technological solutions. While much of the emissions savings of biomethane will be counted in the energy sector, clear benefits in terms of contributing to delivery renewable energy targets and providing alternative land use options for farmers can be gained from an agricultural perspective. The development of a biomethane industry will also provide significant opportunities to reduce emissions in agriculture and improve the likelihood of reaching the sectoral targets. These opportunities with biomethane for agriculture include diversification opportunities for livestock farmers, reduced emissions from animal wastes, biobased fertiliser replacing chemical fertiliser and carbon sequestration on land.

³ EPA – Ireland's Provisional Greenhouse Gas Emissions

Collaboration, like the cooperative model, between farmers, biomethane producers, and policymakers is key to harnessing the environmental and economic benefits of biomethane for the agriculture sector.

Diversification option for farmers

The Climate Action Plan 2024 (CAP 24) states that reaching the 2030 emission reduction targets in the agriculture sector requires supports and options available for farmers to transition to alternative land uses through diversification options. The agri-centric biomethane sector will be a key diversification option for farmers.

- According to Teagasc “Diversification into organic farming, forestry or particularly feedstock (grass) production for biomethane could reduce emissions in 2030 by between 150 ktCO₂ eq year and 417 ktCO₂ eq year⁴.”
- CAP 24 sets a target of reducing emissions by 1,500 ktCO₂ eq yearly by 2030⁵ through diversification options for farmers.

Opportunity to replace chemical fertiliser with a supply of biobased fertiliser

According to CSO data⁶, chemical nitrogen fertiliser sales in Ireland were approximately 345,000 tonnes in 2022 and data from DAFM shows usage of c. 280,000 tonnes in 2023. Climate Action Plan 2024 sets targets to limit the amount of chemical nitrogen fertiliser used in the agriculture sector to 330,000 tonnes by 2025 and 300,000 tonnes by 2030. The emissions benefit of reducing consumption of such fertiliser was experienced in 2022 as a decrease of 14% in fertiliser nitrogen use resulted in 0.44 Mt CO₂eq less emissions from agricultural soils according to the EPA⁷. One of the by-products of anaerobic digestion is digestate, which can serve as an alternative to chemical fertilisers, thus reducing the need for synthetic fertilisers in agriculture. Digestate from AD is rich in essential nutrients such as nitrogen (N), phosphorus (P), and potassium (K), along with other micronutrients.

Helps reduce Ireland's energy emissions

Biomethane will be used as a direct substitute for fossil gas in various applications, such as high-temperature heat, electricity generation and transport. Using biomethane in place of fossil gas reduces CO₂ and other greenhouse gas emissions. This substitution will therefore

⁴ Teagasc Marginal Abatement Cost Curve 2023

⁵ Climate Action Plan

⁶ CSO – Fertiliser Sales

⁷ EPA – Ireland's Provisional Greenhouse Gas Emissions

contribute to reducing Ireland's overall energy emissions. Scenario analysis⁸ carried out as part of the National Biomethane Strategy showed that Ireland meeting its 5.7 TWh target by 2030 would save cumulative CO₂ emissions greater than 2.1 million tonnes⁹ of CO₂eq.

Year(s)	Scenario 1	Scenario 2	Scenario 3
Annual CO ₂ reduction in 2030	c. 1 million tonnes	c. 700,000 tonnes	c. 1.15 million tonnes
Cumulative CO ₂ eq reduction from displacement of fossil gas (2024 – 2030)	c. 1.6 million tonnes	c. 1.5 million tonnes	c. 2.1 million tonnes

Improves gas security and diversification of supply

Ireland relies heavily on imported fossil gas, with circa 75% of gas consumption being imported via the UK in 2023. This figure is expected to rise in the coming years as production at Ireland's Corrib gas field continues to decline. Corrib is expected to cease production around 2035, leaving Ireland solely dependent on gas imports via the UK. The substantial contribution that biomethane could make to gas supply in Ireland (i.e., 5.7 TWh by 2030) will help to diversify sources of gas, improve energy security, and help shield against possible price instability or volatility in international energy markets. As witnessed in 2022, 5.7 TWh is 10% of Ireland's current overall gas demand. As fossil gas demand falls later this decade, the percentage of biomethane in the network will grow. Based on forecasts in the Energy Security in Ireland review, this (5.7 TWh) could rise to 14-20% by 2030 and 62% by 2040 (assuming only 5.7 TWh is developed). The addition of hydrogenation of the residual biogenic CO₂ derived from AD could substantially increase this volume, using green hydrogen generated from curtailed renewables.

Biomethane is not intended to be the only replacement for fossil gas demand. Overall fossil gas demand in Ireland must reduce significantly by 2030 and continue to decline if Ireland is to meet its legally binding climate targets. The development of biomethane will be limited by the availability of sustainable feedstocks, and will therefore require other solutions such as hydrogen and electrification for fully replacing fossil gas into the 2040's.

⁸ More information on the scenario analysis is included below

⁹ Based on a direct replacement of fossil gas (204g CO₂/kWh) and an assumed development profile of AD facilities

Stimulation of the rural economy

Due to the nature of feedstocks required for biomethane production, it is envisaged that most developments will occur in rural Ireland. A Sustainable Energy Authority Ireland (SEAI) report¹⁰ identified that in terms of employment, between construction and operation of AD plants in its 'Increased Biomethane' scenario, circa. 2,700 jobs could be created in the rural economy in Ireland. Similarly, an RGFI and KPMG report¹¹ noted that 3,000+ jobs could be created for rural Ireland by achieving 6.8 TWh from renewable gas by 2030. This equates to circa. 0.44 jobs/GWh. The European Biogas Association¹² conducted in-depth analysis on job generation across the European Biogas sector and calculated the European weighted average direct and indirect jobs per GWh at 0.32/GWh and 0.77/GWh, respectively. Applying these findings to Ireland's 5.7 TWh target indicates the potential to generate up to 1,800 direct jobs and 4,400 indirect jobs across the rural economy in Ireland, helping to stimulate and sustain rural communities.

Development of the National Biomethane Strategy

Stakeholder Engagement and Public Consultation played a key part of the development of Ireland's National Biomethane Strategy. Feedback received has directly informed and shaped the approach taken to target delivery. Stakeholder engagement formed opportunities to provide experienced input, in the form of recommendations, research, and studies, leading to the inclusion of vital considerations for Ireland's National Biomethane Strategy. All of this was done with a view to establishing momentum and delivery within the sector immediately, while achieving a best-in-class indigenous biomethane sector in the longer term.

Scenario analysis completed for the Strategy

Three potential high-level scenarios for the deployment of a biomethane sector in Ireland have been assessed by the National Biomethane Strategy Working Group. While each scenario contains numerous assumptions and uncertainties, they represent possible and credible pathways depending on the design and policy decisions chosen in the National Biomethane Strategy. These decisions included the level of financial support that is available, preferred plant scale and whether to target support for specific end users. Environmental considerations were also at the forefront of the analysis. Centrally located, larger plants utilising the national gas network reduce overall emissions and energy

¹⁰ SEAI – Economic Assessment of Biogas and Biomethane in Ireland

¹¹ An Integrated Business Case for Biomethane in Ireland

¹² EBA – Monetising Biomethane's Whole-System Benefit

consumption. While smaller plants with virtual pipelines require more energy, they were seen as a viable solution for farming groups and community groups as the overall level of sustainable feedstock required could be sourced from the immediate vicinity. The potential cost to Government under each scenario has also been estimated, based on equipment and energy costs as of Q4 2023.

	Widespread Deployment Scenario 1	Current Policies Only Scenario 2	Economic Deployment Scenario 3
Overview	A strategy encompassing a larger number of smaller-geographically dispersed plants	No further policy intervention outside of any existing policies	A strategy which allows flexibility, encourages a smaller number of larger, more economic community-scale facilities
Scale of plants developed	10 - 20 GWh plants	40 - 60 GWh plants	Broad mix but mainly 40 GWh
Feedstock required	25,000 tonnes	40,000 – 60,000 tonnes	25,000 to 60,000 tonnes
Number of plants built by 2030	c. 250	c. 90	c. 140
Policy enablers	All policy enablers deployed including capital grants	RHO & RTFO	All policy enablers deployed including capital grants
Injection	Truck and trailer for small plants	Direct	Direct connection with small % of truck and trailer
Cost to exchequer	Highest	Lowest	Medium
Target Met	Unlikely	Unlikely	Possible

Scenario 1: Widespread Deployment

Scenario one focused on the development of a larger number of smaller, farm-scale AD facilities. Due to their size and location, it was likely that the majority of these would need to transport their gas via truck and trailer to centralised grid injection facilities or to end users. The benefits of this scenario include involving a greater number of rural communities and farmers in the biomethane industry which may also assist with community buy-in. The main

downfall of smaller developments is that they require a higher price for their gas which, without specific financial support, would leave them a less viable option.

Scenario 2: Current Policies Only

Scenario two looked to assess what level of biomethane would develop in the absence of any further policy and resourcing of key agencies. Ireland has supportive rhetoric in place for biomethane with its ambitious 2030 target and some corporates in Ireland have their own carbon reduction goals, which will lead to a demand for some level of biomethane even without further policy support. However, different sectors of the economy will be able to afford different levels of the 'green premium' associated with biomethane. Some will be able to pay the incremental cost while others are unlikely to have the required financial capacity. Based on Working Group analysis, this scenario will see some level of biomethane production in Ireland but is very unlikely to achieve the 2030 target.

Scenario 3: Economic Deployment

Scenario three focussed on what is seen to be the most economic and cost-efficient pathway for developing a biomethane industry. A smaller number of large plants require less infrastructure. Large plants offer benefits from economies of scale and lower off-take prices than small plants. In this scenario, the average sized plant developed is 40 GWh per annum, very similar to the European average. This scenario gave the Government the best chance of meeting its 2030 biomethane production target.

Chosen Scenarios: A combination of Scenario 1 And 3 - Economic and Widespread Deployment

Following the Working Group's review of the proposed scenarios, and feedback from the public consultation it was decided that the Strategy should focus on a mix of Scenario 1 'Widespread Deployment' and Scenario 3 'Economic Deployment'. The Working Group followed several key decision criteria to reach this decision, such as picking scenarios with the best chance of delivering the 5.7 TWh target, while at the same time recognising the need for farmer and community involvement through support for smaller scale plants. While asset deployment and design will ultimately be determined by the private sector, it is recognised that greater incentives to support smaller plants will be required to deliver the 'Widespread Deployment' through farmer and community involvement. Larger plants are generally favoured by developers due to economies of scale, the feasibility of gas clean up equipment and the cost of grid connection.

Economics of biomethane in Ireland

Historically, biomethane was estimated to be around four times more expensive than fossil gas¹³, owing to historically low fossil fuel prices globally, European CO₂ prices and the price of constructing the necessary biomethane production infrastructure. This trend was reversed for a short period during the recent energy crisis where biomethane was cheaper than fossil gas¹⁴. The price of fossil gas has since fallen considerably back to levels pre the Russian invasion of Ukraine. However, today's energy markets are considerably more volatile globally, and Europe's energy and CO₂ prices remain susceptible to weather shocks, unplanned supply outages and unforeseen LNG supply reductions.

While rising gas prices have positive impacts on the business case for biomethane, analysis carried out during the development of the National Biomethane Strategy shows that the global inflationary pressures have had an impact on the cost of producing biomethane leading to increased production costs. Rising gas prices and carbon taxes (or EU ETS allowances) will limit the impact of the cost increases. However, the green premium for biomethane gas in Ireland remains. The cost of producing biomethane depends on several factors such as scale of plant, feedstock supply, proximity of plant to the gas grid, and financing. Scenario analysis carried out as part of the National Biomethane Strategy shows that larger, grid connected plants can produce biomethane at a significantly cheaper price than a smaller scale plant utilising truck and trailer transport of gas.

However, all plant sizes have a role to play. Both large and small models are important, especially the smaller model in the context of achieving buy-in from farmers, the rural community, and the Agri-sector stakeholders. A similar model to the current cooperative models could be implemented in the developing biomethane sector in larger plants to allow for greater farmer involvement and/or ownership. There is a potential role for smaller scale AD plants which use on-farm feedstocks and consume energy on-site e.g. Biogas to Combined Heat and Power. While not contributing substantially to the national biomethane targets, these can play an important role in terms of decarbonising agriculture and play a strong role in the 'social acceptance' of AD.

¹³ Based on historic fossil wholesale gas prices of c. 2c/kWh and historic biomethane prices of c. 8c/kWh

¹⁴ KPMG analysis of Intercontinental Exchange (NBP Gas Prices) and current prices of biomethane

Variable	10 – 20 GWh plant	40 GWh plant	60+ GWh plant
Cost of producing biomethane per MWh¹⁵	€160 to €220 per MWh	€120 to €150 per MWh	€120+ per MWh
Current cost of fossil gas	Circa. €40 per MWh		
2023 cost of carbon (ETS) on a MWh basis	Circa. €20 per MWh		
Green premium required for biomethane	€100 to €160 per MWh	€60 to €90 per MWh	€60 per MWh

Government funding and policy to support biomethane production

A wide range of support mechanisms were assessed during the development of the National Biomethane Strategy, including Feed in Tariffs (FiT) and Contracts for Difference (CfD). Given the need to swiftly stimulate the industry the Renewable Heat Obligation in conjunction with Capital Grants were the chosen method to support the delivery of a biomethane sector in Ireland. This offers budget certainty for the support programme while delivering a sector of scale.

Through the provision of Capital Grants, the Renewable Heat Obligation and industry investment this approach will put Ireland on a trajectory to meet its 5.7 TWh target by 2030.

Measures		Period	Aim
Introduction of the Renewable Heat Incentive (October 2024)	Initial Grant Support Programme (DAFM)	2024-2025	Contribute to 1 TWh CAP target of indigenous biomethane
	Further Grant Support Programme	2026-2030	Contribute at least an additional 1.5 TWh of indigenous biomethane

¹⁵ Costs of producing biomethane are from expert stakeholder consultation which included conversations with developers currently planning AD plants in Ireland and based on financial models of projects in planning in Ireland. It is important to note that these figures are cost of production and not supply.

Renewable Heat Obligation (RHO)

To support the decarbonisation of the heat sector, the Government has agreed to introduce a Renewable Heat Obligation by the end of 2024. The RHO will legislate to obligate suppliers of fossil fuels used for heat to ensure a proportion of the energy they supply is renewable, supporting an increased use of renewable energy in the heat sector and contributing to a reduction in emissions in line with Ireland's climate ambitions. As Ireland imports most of its fossil fuels, the heating sector is a significant contributor to Ireland's high energy import dependency. The RHO will help reduce Ireland's reliance on imported fossil fuels, decrease its emissions in the heat sector and strengthen Ireland's energy security due to greater diversification of its energy streams.

A public consultation seeking stakeholder feedback on proposed features of the RHO was launched on the 15th of August 2023, closing on the 6th of October 2023, and received 51 submissions from a wide range of interest groups.

Under current proposals, the RHO would recognise biomethane as an eligible fuel for certification, providing an important policy tool to support the development of an indigenous biomethane sector and delivery of the Government target of 5.7 TWh by 2030. As part of the consultation, an initial introductory rate of 2% was considered whereby suppliers of a 1,000 GWh of fossil fuel used for heat would be obligated to demonstrate an initial 2% of the energy they have supplied is from a renewable source. To ensure adequate time for market development, a phased introduction across an initial 3-year period was also considered which would allow each supplier to achieve this 2% rate across 3 years from time of introduction. From year 4, annual rate increases up to a final target level of 10% by 2030 was proposed. 10% of heat demand in 2030 is currently forecasted to be c. 2.9 TWh to 4 TWh. Alignment of annual obligation rate increases against fuel availability and sustainability of eligible renewable fuels will be carefully managed to support on-going delivery of the 5.7 TWh target.

CAP 24 commits to the publication of a high-level RHO scheme by Q3 2024. Obligation impact analysis is being finalised and will directly inform the final scheme design. It is expected that as part of this publication, obligated parties will be informed of initial and final target rates, along with obligated period and scheme duration.

Capital Grant Supports

AD plants are capital intensive projects. Along with operational costs (including feedstock and financing costs) this drives the per unit revenue required by the plant, and in turn the

‘green premium’ over fossil gas. A capital grant can reduce the ‘green premium’ required (although not eliminate it entirely, due to high ongoing operational costs).

The Department of Agriculture, Food and the Marine, through the Department of Public Expenditure, NDP Delivery and Reform have applied for funding, intended to help support the initial development (up to 1 TWh) of biomethane in Ireland. The Government has approved the inclusion of a biomethane section, upscaling a biomethane industry in Ireland, within Ireland’s REPowerEU chapter. The chapter sets out that DAFM is to receive funding of €40 million for a capital grant scheme for biomethane production plants. This funding is subject to European Commission and Council assessment and approval.

It is envisaged that AD plants currently operating to produce biogas will be eligible for capital support to upgrade their facilities to produce biomethane and other biobased products, along with new AD plants. Further details on the requirements will be set out when the competitive call for funding is announced in the coming weeks. While all sustainable feedstocks will be eligible to apply for this initial capital funding, a key aim of the initial grant support will be to develop an agri-led AD plant.

Government is committed to supporting an indigenous biomethane industry and target delivery of up to 5.7 TWh by 2030. As energy policy lead, DECC will take responsibility for this second round of capital funding from 2026 which will support up to an additional 1.5 TWh by 2030. As with the initial support programme, it is envisaged that AD plants in operation upgrading to biomethane production and new plant builds with full planning and permitting permissions would be eligible for capital support.

All capital grant supports will have sustainability as a key consideration as Ireland looks to change the way we source our energy. The sustainability requirements under the Renewable Energy Directive will need to be stringently adhered to in all funded projects.

Industry investment in biomethane

Gas Purchase Agreements (GPA)

Recent natural gas price volatility has at times erased the green premium required for biomethane compared with natural gas, supported by domestic carbon tax increases and EU ETS allowance price increases. However, it is still expected that a green premium will exist into the medium-to-long term. Notwithstanding this, it is important to recognise that today’s macro and policy environment is different from five to seven years ago when other jurisdictions were mobilising their domestic biomethane sectors. The net-zero agenda is now locked into national policies, and decarbonisation has become a commercial commitment

within many leading corporates. As part of the National Biomethane Strategy stakeholder consultation, a significant number of corporate entities expressed a recognition of the need, and their willingness to pay a green premium, with the overall demand for biomethane at an unprecedented level.

Finance availability

Access to finance can be a significant challenge for AD developers. This is especially the case with nascent sectors, as is the current case for the biomethane sector in Ireland. It is envisaged that this challenge will be especially relevant for smaller scale farmer-led / farmer-controlled projects as opposed to the larger (40 GWh) developer-led installations. In recognition of this, the Working Group has recommended that the potential for an appropriate smaller scale (c. 10 GWh plants) finance scheme be explored in more detail and completed by Q4 2024.

Biomethane usage in the European Union Emissions Trading Scheme in Ireland

EU ETS installations that procure biomethane for their gas demand do not have to purchase EU ETS allowances to cover that gas consumption, due to biomethane being a zero-carbon rated fuel. With ETS allowance prices in the region of €70-€90 per tonne in 2023¹⁶, this is now an economic incentive for these installations to switch to biomethane. During the stakeholder consultation undertaken during the design of this strategy, it was recognised that no biomethane was currently consumed by ETS customers in Ireland. This potentially stems from a lack of knowledge in the sector about the monitoring and verification processes that are now in place. The Working Group has collaborated with the EPA and GNI to ensure the correct measures are now in place through the Green Gas Certification Scheme for reporting and monitoring biomethane in the ETS sector.

- The EPA will communicate with all EU ETS companies in Ireland to ensure they are aware of the possibility of using biomethane in the EU ETS sector. Along with the communication there will be a process flow on how the verification process works as part of the annual verification. The EPA is currently working on this process and will share learnings with all the EU ETS companies by end of Q3 2024.

Sustainability of biomethane production in Ireland

A fundamental objective of the establishment of an indigenous biomethane industry is to promote and enhance environmental sustainability. As such, all AD plants must be expected to meet the highest of environmental standards, including, though not limited to, Renewable

¹⁶ Ember – Cost per tonne of carbon dioxide produced

Energy Directive sustainability criteria compliance. A key part of the communications planned around the Strategy and the online Information Hub to be developed will ensure that information, guidance, and best practice around sustainability is shared with potential developers.

Renewable Energy Directive

For biomethane from AD plants to be classified as a zero-carbon renewable fuel, plants must be able to achieve increasingly strict sustainability criteria as outlined within the EU Renewable Energy Directive II (“RED”) and RED III criteria. The RED II criteria stipulate that biomass fuels produced from agricultural biomass cannot be derived from raw material obtained from (1) land that was formerly peatland; (2) lands with a high biodiversity value; or (3) lands with a high carbon stock. In addition, RED II requires that all biomass fuels used for electricity, heating and cooling must achieve at least a 70% GHG emission saving, increasing to 80% for installations that start operating from 2026. For the transport sector the GHG emissions saving criteria is less stringent and must meet a 65% saving versus the fossil fuel comparator.

The Renewable Energy Directive’s sustainability criteria must be applied by biogas facilities beyond 200 Nm³/h of installed capacity. The Biomethane Sustainability Charter will set similar guidelines for plants that fall outside the RED threshold, if any of that scale are developed in Ireland. They include substantial GHG emissions savings calculated along the supply chain and the guarantee that biomass sourcing has a minimum impact on biodiversity and soil quality. Compliance with such criteria is necessary to qualify as renewable, to be eligible for any potential financial support, and to be zero-rated under the EU emissions trading system. To demonstrate compliance with such criteria, biogas and biomethane producers must certify their production with one of the European Commission’s recognised voluntary schemes.

Minimising methane leakage

Methane is a powerful greenhouse gas, second only to carbon dioxide in its overall contribution to climate change. On a molecular level, methane is more powerful than carbon dioxide¹⁷. Although it remains for a shorter time in the atmosphere, it has a significant effect on the climate. During the production process of biomethane, methane can leak from multiple points including the upgrading process and digestate storage. It is critical that methane leakages are kept to a minimum. Ireland’s biomethane sector can take significant learnings from other successful jurisdictions in minimising methane emissions from AD

¹⁷ [EU Strategy to reduce methane leakage](#)

plants. For example, in Denmark a mandatory regulation was issued by the Energy Agency that requires an annual leak detection inspection by a third party, and a maximum target of 1% methane leakage was introduced for upgrading units¹⁸. Biomethane will be the main income of an AD plant and developers will need to ensure for sustainability concerns and economic reasons that very low levels of methane escapes from the entire AD process.

- Through the development of the Biomethane Sustainability Charter and working with experts in the industry and other stakeholders, the Biomethane Working Group will assess best practice guidelines around methane leakage suitable for the biomethane sector in Ireland.

Green Gas Certification Scheme

Renewable gas certificates (sometime referred to as “Green Certs” or Guarantees of Origin) can be issued to producers of biomethane who inject into gas grids. The EU has approved a number of schemes (EU Voluntary Schemes) such as International Sustainability and Carbon Certification (ISCC) or Red Cert that are authorised to verify whether the biomethane produced qualifies as a renewable fuel. Producers that meet the necessary requirement can be issued with proofs of sustainability, which record and declare their production of biomethane as renewable.

The Scheme is fully compliant with the EU Renewable Energy Directive and associated IPCC processes and guidelines, providing reassurance and confidence to the consumer, regulator, and Government. The key financial benefit of buying Green Certs is that they remove the need to pay carbon tax, or, for customers falling under the EU Emissions Trading System (ETS) system, it removes the need to purchase allowances.

Following the EU’s RED II regulations, the Minister for the Environment, Climate and Communications passed into Irish law the Statutory Instrument number 350 of 2022 on 12th July 2022. This legislation appointed Gas Networks Ireland as the Issuing Body for Guarantees of Origin for Gas produced from renewable sources. In addition to this, the Commission for Regulation of Utilities (CRU) is set to establish a supervisory framework, against which guarantees of origin can be issued. At present, the Supervisory Framework governing the operation of the Registry is being prepared by the CRU. When this step is concluded, arrangements for the import and export of Guarantees of Origin will be developed.

¹⁸ [European Biogas Association](#)

Currently there is no certification scheme or guidance around biomethane that is not injected into the gas network. Working together in conjunction with the Biomethane Implementation Group, GNI and SEAI will determine the best method for certifying biomethane that is directly transported to end users from biomethane developments. The supervisory framework will also include the full sustainability objectives as included in the Biomethane Sustainability Charter.

Development of a Biomethane Sustainability Charter

To ensure the successful roll-out of an agri-led biomethane industry, and protect against unintended negative consequences, the Strategy Working Group has advised on the development of a Biomethane Sustainability Charter. This Charter will apply to all biomethane projects being developed in Ireland in receipt of any form of support or operating under the RHO. The Charter would outline the key requirements that participants in the biomethane industry must adhere to. The Charter will cover AD plant developers and owners, those supplying feedstock into AD plants, plant operators, and those farmers acting as off-takers for the digestate. This will be included in any certification or sustainability framework for biomethane.

- The Biomethane Sustainability Charter will be fully developed in consultation with policy, industry, and societal stakeholders and led by the Biomethane Implementation Group.
- It will include issues covered by RED II as discussed above, as well as land use, water quality, biodiversity, fertiliser use, carbon sequestration, and any other life-cycle sustainability issues to the extent that they're not addressed in RED II.
- Particular attention will be paid to opportunities to pursue co-benefits for biodiversity and water quality in the roll-out of biomethane feedstock production, e.g. where land management for water or nature restoration goals can be designed or timed to produce feedstocks as a co-product.

Sustainable feedstocks and pre-treatment of feedstocks for biomethane production in Ireland

SEAI's National Heat Study¹⁹, Teagasc and KPMG's Sustainability of Biomethane Production in Ireland²⁰ report, provide comfort that there is sufficient research and analysis carried out on the sustainable feedstock required to meet 5.7 TWh by 2030. The

¹⁹ SEAI National Heat Study

²⁰ Sustainability of Biomethane Production in Ireland

INFORMBIO²¹ project is also integrating biomass mapping, value-chain analysis, life-cycle assessment, and scenario modelling to quantify the potential of the bioeconomy to contribute to Ireland's climate, biodiversity and sustainability targets.

Research²² was conducted at Teagasc Grange to determine the environmental sustainability of biomethane production in Ireland. Several feedstocks evaluated included co-digestion of forage silage (one of a perennial ryegrass sward fertilized with artificial nitrogen, a perennial ryegrass/legume sward with zero artificial nitrogen or a multi-species sward with zero artificial nitrogen) and cattle slurry.

Sward Type	Species	Nitrogen input (kg / ha)	Annual DM yield (kg / ha)
PRG/120N	Perennial ryegrass	120	9,517
PRG/RC	Perennial ryegrass, red clover	0	10,771
MSS/0N	Timothy, perennial ryegrass, red clover, ribwort plantain, chicory	0	11,679

The research showed that chemical fertiliser inputs and sward type used in silage production are key determinants in the sustainability of biomethane production. The report concluded that to meet RED requirements, silage should be produced with minimal chemical fertilizers to meet the necessary emissions savings.

The results of the research have shown that 11/12 scenarios tested the heat sector and 12/12 scenarios tested for the transport sector meet the sustainability criteria as set out in the Renewable Energy Directive. The research also shows the importance of clover and multi species swards in their ability to improve yields in the absence of nitrogen inputs. The incorporation of legumes, such as white or red clover, into perennial ryegrass or multi-species pastures are required. DAFM have developed several initiatives in order to increase sustainable productivity of grasslands. DAFM will review the current schemes operating to support the sowing of legumes in grassland pastures.

²¹ Informbio Project - for a sustainable and circular Irish bioeconomy

²² Beausang et. al

Slurry from 1.3 million cattle will be required to meet the 2030 target which represents approximately 20% of all winter cattle slurry produced in Ireland²³. To facilitate a balanced feedstock for AD, the research assumed an equal mix of grass silage and slurry on a fresh weight basis. Sufficient and suitable slurry storage will be crucial to limit fugitive methane emissions and to ensure that slurry is available all year round for co-digestion. The deployment of manure methane abatement additives should also be considered to optimise the recovery of methane during the AD process and to limit fugitive losses.

Teagasc²⁴ estimate that, at a national level, total land area of c. 120,000 ha (less than 5% of available land) will be needed to produce the silage to feed the AD biomethane plants required to reach the 5.7 TWh target. This land area will come from land already utilised for growing grass. The land area requirements are based on current average yields on Irish grassland farms in which case some displacement of livestock is a likely consequence. These average yields could be improved with the incorporation of legumes, such as white or red clover, or using multi-species swards and this would reduce the level of displacement and chemical fertiliser required.

- The Biomethane Implementation Group will assess the yield enhancements required to be implemented at a farm level and how best to avoid unintended consequences to agricultural emissions while increasing yields. This will be a key component of the Biomethane Sustainability Charter.

While food waste may be considered the optimal feedstock for AD, there is insufficient resource available to meet the required scale. There is potential to maximise biomethane potential using wet and dry anaerobic digestion from existing feedstocks of biowaste e.g., brown bin and industrial organic wastes. Recent estimates from Cre²⁵ suggests that by 2030 Ireland's biowaste sector can contribute a total of up to 1 TWh of biomethane. Sewage sludge is another potential non-agriculture feedstock for AD that is currently generating biogas in Ireland that could be utilised to generate biomethane while also processing the sludge.

Feedstock Input/ Tonne	Biomethane Output
Poultry Litter	1.350 MWh/tonne
Grass Silage	0.836 MWh/tonne

²³ [Teagasc – Joint Oireachtas Committee Meeting Opening Statement](#)

²⁴ Teagasc – Marginal Abatement Cost Curve 2023

²⁵ Blueprint for Biowaste in Ireland by 2030

Hen (layer) Manure	0.722 MWh/tonne
Cattle Farmyard Manure	0.378 MWh/tonne
Spent Mushroom Compost	0.277 MWh/tonne
Animal Slurry	0.122 MWh/tonne

An important aspect of operating an AD facility is the biological performance inside the digesters. To optimise this, it is necessary to incorporate small quantities of carbon led feedstocks (such as whole crops or similar) unless the carbon can be derived from other waste sources. The above table is an example of average energy content of different feedstocks, which will depend on several factors including slurry type, grass type etc. the above list is also not an exhaustive list of potential feedstocks.

- The Biomethane Implementation Group will assess, alongside stakeholders such as Teagasc, the development of an advisory programme for farmers/feedstock suppliers supplying feedstock to AD plants.

Sustainable digestate management

Sustainable biomethane production must also be cognisant of the digestate output after the AD process. Digestate has typically been viewed as a waste product and burden for AD plants, with operators commonly paying farmers (alongside feedstock agreements) to act as off-takers. However, transforming digestate into valuable biobased fertiliser can shift this 'waste' material into a potential revenue stream for plant operators.

AD offers an opportunity to add value to the animal slurry by processing it into a safe and valuable product (biobased fertiliser) and removing the need for slurries to be spread in the immediate vicinity of farms. AD with digestate processing will allow for centralised management of manure in areas of surplus nutrients and creates an opportunity to support compliance with the Nitrates Directive limits. Digestate can be processed into pelletised form, for example, and exported from areas high in nutrients to areas that require additional nutrients. Nutrient recovery technologies aim to increase the availability of nutrients in digestate and process it into a more concentrated form. The nutrients harvested from these processes can help to offset the overall cost of biomethane and provide valuable renewable nutrients for use on-farm.

- The critical role of digestate management will be a key focus of the Biomethane Implementation Group. They will assess the support and research needed to develop a biobased fertiliser sector utilising digestate in Ireland.

- The Biomethane Implementation Group will work with the EPA and Teagasc on a product specification for digestate and assess an end of waste protocol for digestate.

Carbon Dioxide (CO₂) capture from gas upgrading equipment

During the process of upgrading biogas into biomethane, biogas is separated into CH₄ and CO₂ to produce biomethane. The CO₂ is captured at relatively low cost compared to other streams of CO₂ due to its high purity. Capture technology is mature and well-understood and is already implemented across Europe's biomethane production units. Capturing biogenic CO₂ improves the sustainability of biomethane production as it limits emissions to the atmosphere in addition to biogenic CO₂ directly replacing sources of fossil fuel produced CO₂. Biogenic CO₂ offers AD developers an opportunity to diversify their income to complement their sales of biomethane. This Biogenic CO₂ is likely to be in high demand in Ireland as several projects in Ireland and Europe assess the production of future fuels such as green methanol and Sustainable Aviation Fuels (SAF), both of which will require significant volumes of biogenic CO₂. Due to the abundance of offshore wind in Ireland, there is a vast potential for developers of these fuels to assess projects in Ireland.

Ireland's current demand for CO₂ is low (c. 50,000 tonnes per annum) and could be met from a small number of AD plants with carbon-capture equipment. Each 40 GWh plant constructed with CO₂ capture could produce c. 5,500 tonnes of biogenic CO₂ per annum²⁶, showing the need to develop alternative uses for this valuable commodity. New innovative opportunities considering the use of biogenic CO₂ for food and biobased product production could be considered. Other potential markets could open in the medium to long term once economic models and/or technologies are mature (such as enhancing methane production in AD through hydrogen-based upgrading of the CO₂), and the right policy framework is in place. Consideration of incentivising curtailed renewable electricity derived hydrogen to support the achievement of the targets will be analysed in the development of the RHO.

- The Biomethane Implementation Group will assess the role biogenic CO₂ from the AD sector will have for future fuels (such as SAF or Green Methanol) in Ireland with relevant stakeholders.
- The Biomethane Implementation Group will engage with the relevant Departments during the development of any Carbon Capture policy framework and/or Strategy.

²⁶ [Biomethane Industrial Partnership](#)

Enhancing alignment between biomethane, biodiversity and the bioeconomy

National policy statement on the bioeconomy

The policy statement identifies guiding principles that aim to translate the National Bioeconomy Vision into coordinated action. The sustainability principle indicates that environmental sustainability is an integral, core principle of the bioeconomy and products developed must be sustainable. Feasibility assessments should include environmental and social feasibility. The amount of biomaterial extracted should not have a negative impact on our biological resources; it should not exceed the capacity of the environment to replenish itself; and should cause no lasting damage to an environment. This should be regarded from a holistic view, which takes all biomass into account, including that in the soil. Activity in the bioeconomy should not degrade resilience or biodiversity and should contribute to restoration of ecosystems through use of multispecies swards and reduced nitrates leakage. The cascading principle indicates that higher value applications are preferentially derived from biological resources (e.g., food, biobased materials and chemicals) prior to their use in energy and fuel generation which enables the maximum value to be derived from bioresources.

Biorefining

Key to this is green biorefineries which process materials such as grass, silage, and other forages to extract out valuable compounds and substrates including proteins and fibres. The resulting residual material and other by-products, which would usually be waste products, can instead be used in co-located AD plants as co-substrate, for instance for slurry. With the highest proportion of permanent grassland in Europe, Ireland is well positioned to consider developing green biorefineries. The Government aims to grow and develop the bioeconomy and will be investing up to €30 million in biorefinery piloting and demonstration facilities over the next 2-3 years. A new national Bioeconomy Action Plan for 2023-2025²⁷ was published in October 2023.

Soil health restoration through adoption of multi-species swards and the reducing the use of pesticides

A successful sustainable biomethane industry in Ireland will be significantly assisted by a wider adoption of Multi-Species Swards. DAFM have opened Multi Species Sward Measure (MSSM) on the 5th of March 2024 and will pay farmers up to €300/ha to establish a Multi-

²⁷ [Bioeconomy Action Plan 2023-2025](#)

Species Sward (MSS) on their farm with key sustainability conditions part of this scheme. Farmers must avoid commonage and land designated as Natura 2000 and avoid replacing areas of existing biodiversity (naturally diverse permanent pasture that is not designated) with new multi-species swards. Work at Dowth²⁸ Research Farm has shown an increase of 300% in earthworm population (a key indicator species for soil health and biodiversity) under Multi-Species Swards compared to monoculture ryegrass. MSS require less pesticide and fertiliser than ryegrass and the implementation of MSS will have multiple benefits. Once optimal conditions are met, the need for inputs is greatly reduced.

Enhancing Ireland's biodiversity through the restoration of hedgerows, improving air and water quality

A sustainable biomethane sector in Ireland can have multiple benefits across several important environmental areas such as biodiversity and water quality. There are currently several regulations that landowners and farmers must abide by including: Good Agricultural and Environmental Condition (GAEC) 8 is a regulation that regulates the minimum share (4%) of land devoted to non-productive areas or features on all agricultural area, retention of landscape features, ban on cutting hedges and trees during the bird breeding and nesting season and measures for avoiding invasive plant species. Through the development of the Biomethane Sustainability Charter there will be an opportunity to increase the minimum share of land devoted to biodiversity enhancement and achievement of good status for waterbodies. Anaerobic digestion must contribute to the protection and enhancement of biodiversity and water quality. Climate solutions must also be nature solutions.

The Nitrates Regulations (SI 113 2022) are in place to protect waters from pollution caused by nitrates, which include both nitrogen and phosphorus. These regulations set out the key periods for spreading manures and the buffer requirements along watercourses. Water quality is also protected through the adoption of best practices for water quality such as setback distances to water courses, and adoption of attenuation measures from drains. The utilisation of digestate is expected to have a further positive impact on water quality in Ireland. Digestate will be processed (water removed and recirculated into the AD process) leaving mainly a fibrous material, which when spread is less susceptible to enter the watercourse.

- The Biomethane Implementation Group while assessing biobased fertilisers, will ensure through the Biomethane Sustainability Charter that guidelines are in place for best practice when spreading biobased fertilisers.

²⁸ [Sustainability of Biomethane Production in Ireland](#)

Biomethane consumption in Ireland by sector

Sustainable Biomethane production volumes will always be limited by the availability of sustainable feedstocks. It is critical that biomethane resources are principally used in sectors where no alternative decarbonisation options exist, such as high temperature heat processes. In the absence of policy interventions, it is expected the sector that pays the highest premium for biomethane will ultimately secure the resource.

High thermal heat (on grid or off-grid)

Utilising biomethane for high temperature heat processes is a key decarbonisation option for industry in Ireland and ultimately the most efficient use of a limited resource. Industrial processes with high temperature demand (>200oC) currently have very limited choices when it comes to economic decarbonisation. Biomethane can provide an immediate decarbonisation option for these consumers without impacting their processes or requiring capital expenditure due to its identical chemical make up to fossil gas (off-grid solutions would require capital expenditure). The SEAI's National Heat Study states that optimal application for biomethane is in the decarbonisation of operations with high direct heat demands for which alternatives such as electrification are currently more challenging.

Climate Action Plan 2024 sets a KPI for 2.1 TWh zero carbon gas being consumed in the industrial heating sector by 2030. This is likely to be met by biomethane due to the development timeline and expected economics of green hydrogen in Ireland.

- Biomethane will support the decarbonisation of Ireland's heat sector through the RHO scheme.

Transport sector

Decarbonising Ireland's transport sector (the second most emissions intensive sector within the economy at 19.1% of total GHG emissions in Ireland in 2022²⁹) poses a particular challenge to reaching Ireland's 2030 emission reduction targets. Heavy Goods Vehicles (HGVs) warrant particular attention in the transport sector given their high emission reduction potential in HGVs switching from diesel to alternative, low-carbon fuels such as Bio-CNG. In 2022, only 3% of registered vehicles in Ireland were classified as HGVs yet the SEAI estimates indicate that these vehicles were responsible for 20% of total transport CO₂ emissions.

In line with the requirements of the EU Alternative Fuel Infrastructure Regulation which came into full application in April 2024, the Department of Transport is undertaking an update of

²⁹ EPA

the Government's current National Policy Framework for Alternative Fuel Infrastructure, with a final policy framework to be submitted to the European Commission by the end of 2025. This update will include further consideration of the role for alternative fuels such as Bio-CNG in transport, relative to other renewable and zero-emission alternatives. While electrification looks certain to be the future technology for HGVs due to advancements in battery technology, there is potential for Compressed Natural Gas (CNG) vehicle operation to continue to be decarbonised by biomethane which offers an immediate option for the existing HGV fleet to reduce emissions.

Supply of biomethane in the transport sector will continue to be supported under the Renewable Transport Fuel Obligation (RTFO) as provided for in the Energy (Biofuel Obligation and Miscellaneous Provisions) Act 2010. The RTFO currently allows for RTFO certificates to be awarded for biomethane supply for transport use.

- Biomethane will support the decarbonisation of Ireland's transport emissions through the RTFO scheme.

Electricity sector

As set out in Climate Action Plan 2024, zero-emission gas fired generation from biomethane, and hydrogen is to commence by 2030. The recently approved RED III³⁰ indicates that any future renewable electricity production from biomass sources (i.e., biomethane) needs to include BECCS (Bioenergy with Carbon Capture and Storage), however there could be an immediate role for biomethane in electricity back-up or production at large energy users in Ireland.

- ESB Networks is proposing to immediately progress a lighthouse project working with an Extra-Large Energy User to procure sustainable biomethane for their on-site electricity generation or back-up generation. This would help develop the biomethane sector in Ireland, while reducing the need for public subsidies. The Biomethane Implementation Group will meet with ESB Networks to discuss this proposal in detail before end Q2 2024.

Built environment

As set out in Climate Action Plan 2024, Biomethane can play a key role in the decarbonisation of the Built Environment and offers an alternative to fossil gas, particularly in older buildings or buildings that are currently difficult to retrofit. The sectoral emissions

³⁰ [Renewable Energy Directive III](#)

ceilings for the Built Environment require the delivery of up to 1.1 TWh of renewable gases to be delivered through agriculture-based supply chains by 2030.

- The use of biomethane in the built environment, in both the residential and commercial sectors, will be driven through the implementation of the RHO.

Enabling policies to deliver a successful biomethane sector in Ireland

Non-financial policy and regulatory enablers will have a considerable impact on the successful development of a biomethane industry in Ireland. These enablers can streamline the process, ensure timely development of the sector, and embed best practices into the sector at an early stage.

Resourcing Ireland's key agencies

To meet Ireland's target of 5.7 TWh of biomethane by 2030, the required AD developments and related infrastructure will be subject to consent, including but not limited to planning permissions, licences and permits approved by DAFM, the EPA, Local Authority or An Bord Pleanála as applicable. The scale of the ambition to achieve renewable electricity targets, emergency electricity generation, biomethane production, and other targets set out in the Climate Action Plan requires significant resourcing, particularly in specialist areas such as environmental assessment, for those decision-making bodies which are already operating at capacity. It is an absolute priority of Government to ensure key agencies for the energy transition are suitably resourced. The availability of professional advisors, such as planners and environmental specialists, is also a critical requirement.

Environmental Protection Agency (EPA)

AD plants will require some form of permitting from the EPA or Local Authority. Currently, this varies between a waste permit (Local Authority authorisation), waste licence or an industrial emissions licence (EPA authorisation). The proposed scale of the biomethane sector would put considerable additional pressure on the existing limited capacity of the EPA. Timelines for a waste/industrial emissions licence from the EPA is dependent on several factors including available resources, application prioritisation and the quality of the submitted application and can take up to 15-24 months to process with current resourcing. The EPA, a member of the National Biomethane Strategy Working Group, made it clear during the development of the Strategy that further resourcing is required to ensure timely processing of potential AD facilities based on the need for up to 140-200 plants by 2030.

Department of Agriculture Food and the Marine – Animal By Products

Plants involved in anaerobic digestion of animal by-products or derived products, must be approved by the Department of Agriculture, Food and the Marine, in accordance with Article 24 (1) (g) of (EC) Regulation No. 1069/2009. Currently, there is a small number of AD plants approved by DAFM in operation in Ireland. With the expected scale and feedstock mix of the plants to be developed in Ireland by 2030, it is envisaged that DAFM will have many applications to process. Working with relevant staff during the development of the National Biomethane Strategy, some additional resource requirements were identified in order to deliver on the expected number of applications.

Planning permission for AD developments

AD developments can bring significant benefits to the communities and the local environments in which they are located. Anaerobic Digestion and biorefinery facilities can be significant constructions, with impacts on the environment, biospheres, and the local communities in the area which they are located. AD and other integrated assets are therefore correctly required to undergo a planning process to ensure proper consideration of a range of factors, including location, visual impact, land-zoning plans, and ecology.

Guidelines and requirements for these are set out through several acts, policy documents, spatial strategies, and development plans. Lengthy timelines for decisions were frequently highlighted by stakeholders as impeding the speedy development of AD and other integrated facilities. AD, although a very well-established technology in Europe with over 20,000 plants in operation, is a relatively new and unknown technology in Ireland. Increased awareness of AD technology would improve understanding and consistency of approach by planning authorities to assessing proposed AD developments.

Delivering required infrastructure to connect AD plants

Transporting biomethane via gas pipeline is the most efficient, sustainable, and cost-effective method of transporting the gas to end users³¹. Alternative methods such as ‘truck and trailer’ or ‘virtual pipeline’ also exist but are generally more expensive, less sustainable, and less economic. However, due to the location of Ireland’s gas network and the envisaged location of AD plants, virtual pipeline options will have a key role in the development of a biomethane sector in Ireland.

Under the Connections Policy for biomethane, the customer contributes to the cost of connection:

³¹ Based on modelling and stakeholder engagement carried out in development of the Strategy

- A standard contribution of 30% of the estimated costs for the connection assets.
- A supplemental “economic test” contribution to provide for any shortfall in the capital costs of the connection not recovered through attributable tariff payments.

While the 30% estimated cost of connection is welcomed by developers, there is currently a need for them to have a financial bond in place for the other 70%. This in turn adds to the cost for developers to produce biomethane. A review of this process will be carried out as part of an overall connection (on grid and off-grid) review as set out in the Actions.

GNI needs to deliver an unprecedented amount of infrastructure over the next 6 years to support new electricity generators in Ireland. To ensure AD developments are not hampered by grid connection delays, there is a need to review the status of contestable works³² eligible to be carried out by AD developers. Certainty around the timeline to deliver grid connections to biomethane plants is also a critical component of securing funding for AD developers.

Contestable connections will also increase competition and potentially lead to a cost decrease for any required grid works for AD. Any reduction in the cost of connecting AD plants to the grid will also lead to a decrease in the cost for the bond requirements and the final price of biomethane. The cost of connecting AD plants to the grid in Ireland was shown by developers to be c. 2-3 times more expensive than other neighbouring countries during the stakeholder engagement phase of the Strategy.

- The full cost of connecting AD plants to the gas network, including the requirements for a financial bond will be fully assessed by the Biomethane Implementation Group in conjunction with GNI and the CRU.
- A full review of contestable connections will also take place between GNI and the CRU.
- Due to the importance of getting AD facilities connected onto the gas network, a review of the economic test will take place to ensure all components of the test are in line with the Biomethane Strategy. For example, currently the economic test for the pipeline is carried out on a 10-year basis when AD developments can operate for 25 years plus.
- Cost implications of accessing and utilising Centralised Grid Injection facilities owned and operated by GNI will also be assessed.

³² Contestable gas grid connections are allowed on some distribution grids in the UK, where the developer can have contractors carry out construction works, and the Gas Network Operator would do the final connection to the gas network.

Reverse compression

With the majority of biomethane plants likely to connect to the low-pressure distribution grid in Ireland, there will be times when production at some of these plants will need to be curtailed (due to supply exceeding demand for gas in the local area). The technical solution to this is to install reverse compression equipment to increase the pressure and move this additional biomethane onto the gas transmission network where it can be transported around the country in existing transmission pipelines. The Biomethane Implementation Group will meet with GNI and the CRU to identify how best to plan for these compressors and how the cost of them will be recovered.

Building capacity and capability to enhance delivery of a biomethane sector

Ireland will need to develop skills and training programmes as required for jobs directly involved in the AD biomethane sector and the wider bioeconomy. Alongside the need for construction workers in the near term, plant operators and skilled management teams will be required to operate the AD and other integrated facilities.

Due to the development of AD facilities for several decades across Europe, Ireland will have an advantage over first-movers due to the development of a European supply chain for the technology required for biomethane production. There is an opportunity to develop an indigenous supply chain from the construction phase right through to the engineering, operational and maintenance phase. The need for replacement parts, maintenance, and construction crews for a biomethane industry will provide opportunities for businesses to diversify and set up in Ireland.

Farmers will play a vital role in the development of biomethane in Ireland and capacity and capability will need to be developed. Teagasc will assess any training, information, and supports that farmers might need and put an action plan in place to help develop the skills, infrastructure and knowledge required at farm level.

Outreach and engagement with key stakeholders

Effective outreach and engagement with key stakeholders will be paramount for a successful Biomethane Sector in Ireland. It involves building meaningful relationships, fostering trust, and ensuring alignment of goals with multiple different stakeholders from a wide variety of backgrounds from farming to financiers. The Biomethane Implementation Group will actively seek stakeholder input and feedback on the National Biomethane Strategy including the actions presented here. The Biomethane Implementation Group will host information sessions to share learnings from the process for example, members of the Group will present at conferences across Ireland to share information on the biomethane sectors

development in Ireland, the importance of biomethane and how they can benefit from the sector. This will help inform the public on the Biomethane Strategy and the importance of biomethane on our energy and climate transition.

Development of Project Development Assistance and an Online Information Hub for biomethane developers

There are several different pathways and key agencies that biomethane developers must navigate. To reduce development times and avoid delays, an online Information Hub will be developed that will outline the exact requirements for a project, depending on scale, feedstock type, and tonnages. Promoted on Gov.ie, the Hub will aim to remove some of the uncertainty that arose during the stakeholder consultations about exact requirements for projects. The Hub will support the delivery of project development assistance to improve the maturity of projects through high-quality scientific, technical, and financial advisory support provided by e.g., government, ISIF and European Investment Bank (EIB), and tailored to the needs of projects. Project Development Assistance (PDA) could also provide links to key research and researchers and Innovation Funding opportunities. PDA would especially benefit small-scale projects and projects in various locations in Ireland to help achieve a geographically balanced distribution of support, support sustainability assessments, integration of technologies alongside AD such as biorefining and support cooperative developments. The PDA will be available to both large and small-scale projects, increasing project success by aiding with financial closure, entering operation, and considering opportunities linked to the RHO.

Community engagement and communications strategy

While a well-proven technology, biomethane and anaerobic digestions are relatively new and unknown renewable energy technologies to many in Ireland. The success of the industry will rely on good local stakeholder engagement, as well as broader national information. Good communications will be crucial on the importance of biomethane for Ireland, meeting our climate targets and the available diversification option for farmers. The Biomethane Implementation Group will develop a Communications Strategy by Q3 2024 to help inform the public and developers on the National Biomethane Strategy, biomethane in general and how they can learn more about the technology.

Community engagement from developers will also be key locally to gain support from the communities that will be hosting the AD plants. The online Information Hub that will be developed will provide guidance to developers on best practice engagement and examples from successful projects will be shared.

Summary vision of Ireland's biomethane sector

The National Biomethane Strategy sets out key policy and regulatory enablers to meet the ambitious Biomethane target set by the Government. A concerted effort will be required between Government and industry to ensure the development of a sustainable and successful Biomethane Sector in Ireland.

Vision of Ireland's Biomethane Sector	
Scale of AD facilities	While the majority of AD plants are likely to be 40 GWh or similar scale, there will be a role for smaller farm scale plants.
Feedstock mix	In the initial development of a biomethane sector it is likely that waste products will be utilised in the first instance, closely followed by agricultural feedstocks such as slurries and grass silage.
Regulations and policy	The majority of AD plants in Ireland will be directly connected to the gas network. Supporting policies implemented through the National Biomethane Strategy will aid the development of a successful biomethane sector in Ireland.
Financial supports	Biomethane will be supported through the implementation of the Renewable Heat Obligation and Capital Grants.
End uses of biomethane	Biomethane will be utilised in the heat (RHO), transport (RTFO) and electricity generation (Gas Purchase Agreements) sectors in Ireland.
Sustainability	Through the development of the Biomethane Sustainability Charter, sustainability will be central to the development of biomethane in Ireland.

Implementation, governance, and reporting

The National Biomethane Strategy sets out the opportunity, economics, key actions, and provides a roadmap to developing a sustainable indigenous biomethane industry in Ireland.

This can have a significant impact on Ireland's ability to meet its legally binding climate commitments.

Chaired by DECC, in continuing partnership with DAFM, the Biomethane Implementation Group will support implementation of the Strategy and monitor target delivery. The Group will report on progress in terms of biomethane produced, number of AD facilities in operation and achievement of key milestones within the sector. Reviews by this Group will ensure future iterations of the Climate Action Plan aligns with the needs of the sector as it develops.

Measures for delivering the National Biomethane Strategy

A successful biomethane industry will be accomplished by delivering on key actions set out in the Strategy. Actions are mapped to key pillars as set out in the framework used for developing the National Biomethane Strategy and are detailed in the tables in the appendix. These actions will be reviewed with future iterations of the Climate Action Plan. A newly formed Interdepartmental Biomethane Implementation Group will underpin their delivery. The Implementation Group will report to the Heat and Built Environment Taskforce.

Pillar 1: Sustainability Actions					
No.	Name	Description	Owner	Stakeholder	Delivery Date
1a	Biomethane Sustainability Charter	Develop a Biomethane Sustainability Charter to support the delivery of environmentally sustainable biomethane in Ireland	DAFM, DECC	NPWS, EPA, IFI, LAWPRO, DHLGH	Q3 2024
1b	Feedstocks	Assess current and future schemes to mobilise the development of sustainable feedstocks such as Multi Species Swards and Red Clover	DAFM	Teagasc	Q4 2024
1c	Non-grid certification	Develop a process to certify the end use of non-grid injected	DECC	SEAI, GNI	Q4 2024

		biomethane			
1d	Methane Leakage	Assess the development of best practice guidelines on methane leakage during the development of the Biomethane Sustainability Charter	Biomethane Implementation Group	DECC, Teagasc, SEAI, EPA	Q3 2024

Pillar 2: Demand Actions					
No.	Name	Description	Owner	Stakeholder	Delivery Date
2a	EU ETS	Engage with the EU ETS sector to ensure knowledge of eligibility of biomethane in the ETS sector	EPA		Q3 2024
2b	Renewable Heat Obligation	Throughout scheme lifetime, ensure alignment of strategy target (5.7 TWh) with RHO obligation rate increases	DECC	RHO Scheme Administrator	Ongoing
2c	Renewable Heat Obligation	Publish a high-level scheme design	DECC	SEAI	Q3 2024
2d	Extra Large Energy Users	Assess ESB Networks Lighthouse Project with Data Centre	SEAI	ESB Networks, CRU, SEAI	Q2 2024
2e	Shrinkage Gas	Engage with GNI on plans for procuring biomethane for	DECC	CRU, GNI	Q3 2024

		shrinkage gas			
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Pillar 3: Bioeconomy Actions					
No.	Name	Description	Owner	Stakeholder	Delivery Date
3a	Bioeconomy Pilot Programme	Examine the potential for a pilot programme to improve the maturity of AD projects, providing links to key research, innovation funding opportunities, sustainability assessments, integration of technologies alongside AD such as biorefining and support cooperative developments	DAFM	DECC	Q4 2024
3b	Biobased Fertiliser	Assess relevant policy and supports required to ensure the opportunity for biobased fertiliser from digestate is achieved	DAFM	Teagasc, EPA	Q4 2024
3c	Biobased Fertiliser research call	Hold a competitive call to assess research opportunities for digestate end use	DAFM		Q3 2024
3d	Bioeconomy	Explore the options available for the integration of processed	DHLGH, DAFM	Biomethane Implementation Group	Q4 2024

		manures from the Anaerobic Digestion Industry back into the circular economy to maximise nutrient recycling and integration into primary production systems in line with current and future requirements of the Nitrates Directive			
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Pillar 4: Support Actions					
No.	Name	Description	Owner	Stakeholder	Delivery Date
4a	Capital Grant Support	Open the first competitive Grant Funding Call to contribute up to 1 TWh	DAFM	DECC, SEAI, Teagasc	Q2 2024
4b	Small Scale Finance	Assess the potential for an appropriate smaller scale finance scheme	DAFM	Biomethane Implementation Group, ISIF, SBCI	Q4 2024
4c	Capital Grant Support	Finalise the bid for Capital Grant support from 2026 onwards, to be announced in 2025	DECC	DAFM, SEAI, Teagasc	Q3 2025

Pillar 5: Enabling Policy Actions					
No.	Name	Description	Owner	Stakeholder	Delivery Date
5a	Biomethane	Establish a Biomethane	DECC	DAFM,	Complete

	Implementation Group	Implementation Group to develop and deliver a strategy Implementation Plan under auspices of the Heat and Built Environment Taskforce		DETE, D/Transport D/Finance, DPENDPDR, DHLGH, EPA, LAs, Teagasc, GNI, CRU, SEAI, NPWS	
5b	Grid Connection	Engage with GNI and CRU to review and finalise the biomethane grid connection policy and economic test including the need for financial bonds and costs for grid connections	DECC	CRU, GNI	Q3 2024
5c	Communication Strategy	Develop a communications strategy to engage and inform stakeholders, and support target delivery	DECC / DAFM	Teagasc	Q3 2024
5d	Online Information Hub	Develop an online Information Hub to provide AD project development assistance including information on technical, environmental, and financial advisory supports available	DECC/ DAFM	EPA, GNI, ISIF, DHLGH	Q3 2024

5e	Capacity Building	Carry out a skills gap assessment to build capacity and skills required for an indigenous biomethane sector	Biomethane Implementation Group	DFHERIS, DECC, DAFM,	Q3 2024
5f	Resourcing Requirements	Review resourcing requirements of key government agencies to support development of the biomethane industry including EPA licencing, ABP licencing and Planning	Biomethane Implementation Group	DAFM, D/Finance, DHLGH, EPA, CRU, DPENDPDR	Q3 2024
5g	Guidance	Develop guidelines to support local authorities when assessing AD and biorefinery planning applications	Biomethane Implementation Group	DAFM, DHLGH, Teagasc, SEAI	Q4 2024
5h	Feedstock advisory	Assess how best to advise feedstock suppliers on best practices around sustainably produced AD feedstock supply whilst ensuring best environmental practices	DAFM	Teagasc, SEAI	Q4 2024
5i	Governance Structure	Establish governance structure to support strategy delivery including identification of appropriate KPIs, and target monitoring and reporting process	DECC	GNI, EPA, DAFM, Heat & Built Environment Taskforce	Q3 2024

Members of the Biomethane Working Group

No	Government Department or Agency
1	Department of Agriculture, Food and the Marine (Chair)
2	Department of Environment Climate and Communications
3	Department of Transport
4	Department of Enterprise, Trade and Employment
5	Department of Housing, Local Government and Heritage
6	Department of Finance
7	Department of Public Expenditure, NDP Delivery and Reform
8	Enterprise Ireland
9	SEAI
10	Teagasc
11	Environmental Protection Agency
12	Ireland Strategic Investment Fund

Stakeholder engagement

Initial discussions were held with circa sixty consultees across thirty-eight groups, to hear their expert views on a potential biomethane industry in Ireland. These discussions helped form the Draft National Strategy that was released for public consultation.

Initial stakeholder consultees comprised of policy experts from Ireland and across Europe, industry bodies, developers, and state bodies.

Stakeholder meetings were structured in an open, conversational format to ensure maximum stakeholder engagement. Questions designed for consultees included important considerations and common themes such as: economics, sustainability, regulations, policy, resourcing, scale-of-plants, feedstock, national targets, and potential bottlenecks in developing an agri-led biomethane Industry for Ireland. Stakeholders interviewed were eager to assist with the development of a biomethane industry in Ireland and helping Ireland achieve its 5.7 TWh 2030 target.

A public consultation on a Draft National Biomethane Strategy was launched on the 30th of January 2024. Government sought views on the draft strategy and proposed roadmap to support target delivery. The consultation closed on the 5th of March 2024 and received 200 responses from a wide range of interested parties. Feedback received has directly informed the final National Biomethane Strategy.

Policy context

The Climate Action and Low Carbon Development (Amendment) Act 2021 put Ireland on a legally binding path to net-zero emissions by no later than 2050, and to a 51% reduction in emissions by 2030. To achieve this, the transition must be made to a climate resilient, biodiversity-rich, environmentally sustainable, circular, and climate-neutral economy. Realising these ambitions will require a coordinated effort across Ireland with every economic sector involved. It requires no less than a national transformation over the coming years in how we work, travel, heat our homes, source our energy, use our land and bioresources. Indigenously produced biomethane will play a significant role in enabling this transition to a net-zero economy and offers a unique, scalable opportunity for Ireland.

The development of a biomethane strategy has interlinkages with several other government policy papers that are already published or in development. These set clear parameters under which the National Biomethane Strategy must ensure coherence. A summary of some of these key policy statements are listed below:

Major policy statements 2020-2024

Climate Action and Low Carbon Development (Amendment) Act 2021	• The Act commits Ireland to a legally binding target of a climate neutral economy no later than 2050, and to a reduction in emissions of 51% by 2030. • The Act provides the framework for Ireland to meet these targets, including the preparation of Sectoral Emissions Ceilings and the setting of Carbon Budgets. • The 2022 Sectoral Emissions Ceilings included the delivery of 5.7 TWh of biomethane by 2030.
Climate Action Plan 2024	• The Climate Action Plan 2024 is the third annual update to the Climate Action Plan 2019 and sets out how Ireland can accelerate the actions that are required to respond to the climate crisis, putting climate solutions at the centre of our social and economic development. • The Plan states that decarbonised gases such as biomethane will be a critical component for Ireland's energy system. • The Plan's KPIs include a 2025 target for 1 TWh of

biomethane to be produced and 5.7 TWh to be produced by 2030.

- The Plan KPIs specify at least 1 TWh consumption of zero emission gas for industrial heating by 2025 and 2.1 TWh by 2030.
- The Plan KPIs specify 0.6 TWh consumption of biomethane in the built environment (residential and commercial) by 2025 and 1.1 TWh by 2030.

**Long-term Strategy
on Greenhouse Gas
Emissions
Reductions**

- This Strategy builds upon the decarbonisation pathways set by the carbon budgets, sectoral emissions ceilings, and Climate Action Plan 2023, to ensure coherent and effective climate policy.
- It sets out indicative pathways, beyond 2030, towards achieving carbon neutrality for Ireland by 2050.
- It is underpinned by analysis of transition options across each key sector of the economy and provides a crucial link between Ireland's 2030 climate targets and the long-term goal set by Ireland's National Climate Objective and the European Climate Law.

**National Energy
Security Framework**

- This Framework provides a response to Ireland's energy security needs in the context of the war in Ukraine.
- It focuses on how to support households and businesses, in particular those most at risk of fuel poverty, and how to accelerate the country's shift to increased energy efficiency and indigenous renewable energy systems.
- The framework has an action to appraise the introduction of supports for biomethane as a replacement for natural gas.

**Government
Statement on the
Role of Data Centre
in Ireland's
Enterprise Strategy**

- This Statement seeks to enable the 'twin transitions' of digitalisation and decarbonisation of our economy and society. These transitions can – and must– be complementary. For this to happen, digital and climate change policies need to move in tandem and this Statement sets out the role Data Centres will play in this transition.
- The Statement highlights the CRU Decision (CRU/21/124) that new data centre connections are required to have on-site generation (and/or battery storage) that is sufficient to meet their own demand and, to assist in full decarbonisation of the power system. This generation should also be capable of running on renewably sourced fuels, such as biomethane, when supplies become more readily available.

**Ireland's Road
Haulage Strategy
2022-2031**

- This Strategy focuses on generating efficiencies, improving standards, securing jobs and helping the road freight sector move to a low-carbon future.
- It sets out the measures and supporting policies needed to deliver on these objectives for decarbonisation.

**Renewable
Transport Fuel
Policy 2021-2023
and 2023-2025**

- The Policy sets out the pathway for renewable energy in transport to meet Climate Action Plan 2030 transport decarbonisation targets and requirements for GHG reduction and sustainability criteria in the delivery of EU renewable energy in transport consumption targets in the State.

Hydrogen Strategy

- Develop a roadmap to bring net-zero dispatchable power solutions to market by 2030 to support the delivery of a near net-zero power system by 2035.
- Develop a plan for transitioning the gas network to hydrogen overtime taking due consideration of plans to develop a biomethane sector in Ireland.

**National Biodiversity
Action Plan**

- Ireland's 4th National Biodiversity Action Plan (NBAP) sets the national biodiversity agenda for the period 2023-2030 and aims to deliver the transformative changes required to the ways in which we value and protect nature.

**Bioeconomy Action
Plan**

- This action plan will further develop Ireland's bioeconomy, in environmental, economic, societal and policy terms, for the period 2023 to 2025, through 33 actions balanced across 7 key strategic pillars.

Land Use Review

- The Programme for Government 2020 committed to a Land Use Review to ensure that optimal land use options inform all relevant Government decisions.

In addition to the above, several future actions are being progressed under Climate Action Plan 2024 which will have relevance to the development of biomethane policy in Ireland as listed below:

List of relevant Climate Action Plan 2024 actions

Category	Theme	Action/KPI
Electricity	Accelerate Flexibility	• 2030 KPI: Zero Emission gas fired generation from biomethane and hydrogen commencing by 2030
Industry	Increasing Use of Zero-emission Gas	• 2030 KPI: At least 2.1 TWh consumption of zero emission gas for industrial heating
Built Environment - Residential	Reduce Emissions from our homes	• 2025 KPI: Use of up to 0.4 TWh of Biomethane by 2025 • 2030 KPI: Use of 0.7 TWh of Biomethane by 2030
Built Environment - Commercial	Reduce Emissions from our commercial buildings	• 2025 KPI: Use of up to 0.2 TWh of Biomethane by 2025 • 2030 KPI: Use of 0.4 TWh of Biomethane by 2030
The Circular Economy and Other Emissions	Reduce Emissions from Petroleum Refining	• Measures to deliver sectoral emissions ceilings: Investigate applicability of use of biomethane in the petroleum refining process.

Several EU policy developments and initiatives are also highly relevant to Ireland's National Biomethane Strategy. These set clear ambitions and principles for Member States to consider in the development of national policy as well as measures to enable cooperation and cross border activities in this area. A summary of selected key policy statements is listed below:

European Major Policy Statements 2020-2024

RePowerEU	• The European Commission's plan to reduce the European Union's dependence on Russian fossil fuels by
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	diversifying gas supplies and speeding up the roll-out of renewable gases as well as a high rate of electrification for space heating and lower temperature processes. • Sets an EU biomethane production target of 35bcm (c. 342 TWh) by 2030.
EU Energy System Integration Strategy	• Sets out the need to develop a more integrated energy system and optimise the use of existing assets to deliver the energy transition at least cost. • The strategy calls for application of the “energy efficiency first” principle, acceleration of the electrification of energy demand, and promotion of renewable and low carbon fuels (such as biomethane) for sectors where electrification will not be feasible or cost effective.
EU Hydrogen and Gas Market Decarbonisation Package	• Sets out proposed changes to the 2009 package, which decided the market rules under which natural gas undertakings operate. • The revised package has five core objectives: 1 To create a legislative framework for establishing an EU hydrogen market 2 To facilitate the integration of renewable and low carbon gases onto the network 3 To protect and encourage more active consumer participation in the market 4 To foster more integrated network planning 5 To enhance resilience and security of supply
Fit for 55	• Fit for 55 contains a host of legislative packages including the recast Renewable Energy Directive, the Alternative Fuels Infrastructure Directive, ReFuelEU Aviation and FuelEU Maritime, amongst others. • These legislative proposals set out the requisite actions to deliver a 55% reduction in greenhouse gas emissions by 2030 across the EU.
Nature Restoration Law	• The European Commission’s proposal for a Nature Restoration Law is the first continent-wide, comprehensive law of its kind. It is a key element of the EU Biodiversity Strategy, which calls for binding targets to restore degraded ecosystems, in particular those with the most potential to capture and store carbon and to prevent and reduce the impact of natural disasters.

