Rialtas na hÉireann
Government of Ireland

Biomethane Environmental Sustainability Charter

Supporting the delivery of environmentally sustainable biomethane production in Ireland

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Prepared by the Department of
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gov.ie/DCEE

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1 Introduction

Government is committed to supporting the ambitious target of up to 5.7TWh of indigenous produced biomethane by 2030. A fundamental objective of the establishment of an indigenous biomethane industry is to promote and enhance economic, social and environmental sustainability. As such, all AD plants must be expected to meet the highest of environmental and industry standards, including, though not limited to, Renewable Energy Directive sustainability criteria compliance.

Sustainability compliance must align with SI 350 of 20XX and RED criteria to avoid ambiguity, except where this framework specifies more stringent sustainability criteria or as defined by each biomethane mandate/ support scheme's terms and conditions.

To ensure the successful roll-out of an Agri-led biomethane industry, and mitigate against unintended negative consequences, a priority deliverable under the recently published National Biomethane Strategy is the development of a Biomethane Environmental Sustainability Charter.

The Biomethane Environmental Sustainability Charter has been developed in consultation with policy makers, relevant state agencies, industry representatives, and key societal stakeholders, and led by the Biomethane Implementation Group.

2 Scope & Vision

Sustainable biomethane production, including careful management of feedstocks and digestate, requires a holistic approach that considers all environmental factors. By following the best practices outlined in this document, operators, farmers, engineers, planning consultants, design engineers and developers demonstrate their commitment to maximizing the benefits and valorisation of anaerobic digestion and bio-based products, while minimizing its environmental impact, improved water quality and ensuring high health and safety standards. A number of the commitments and recommendations included in this charter are existing regulatory or legal obligations. These have been included in the Charter for consistency and completeness and duplication of work stemming from these requirements is not expected.

This Charter includes environmental safeguards which will apply along the full biomethane supply chain to include both waste based and agricultural AD plants. The commitments of the charter will be the responsibility of AD plant developers, owners and operators, those supplying feedstock into AD plants, and those acting as off-takers for the digestate. It is

envisaged that farmers, both individually and collectively through their co-operatives will play a key role along the supply chain as well as operating/owning/ co-owning some AD plants. there are significant opportunities to from impactful collaborative structures between a range of regionally based entities to unlock economic, social and environmental opportunities in the bioeconomy, with biomethane production as a core technology.

This Charter will apply to all biomethane plants of all sizes (apart from Animal By Products (ABP) type 9 plants and plants below 1MW thermal output of 100Nm^3 biomethane per hour), being developed in Ireland in receipt of any form of public funded support or operating under a National AD/Biomethane support scheme or producing gas eligible for issuance of RHO or RTFO certificates. The Charter outline's best practices and best available technologies that participants in the biomethane industry should commit and adhere to in the planning, design, construction and operation of AD plants, and includes issues covered by the Renewable Energy Directive (RED III), as well as land use, water quality, biodiversity, bio fertiliser and other bio-based products use, and any other life-cycle sustainability issue.

The development and deployment of new biomethane production capacity must fall within the existing framework of legal and regulatory obligations, from a planning and licensing perspective, to protect the environment and human health. The Charter recognises that industry requirements such as ABP Regulations along with EPA licensing requirements, Local Authority permits, and the environmental considerations required by Best Available Techniques (BAT) for biomethane/AD technologies, need to be considered early in the design and planning of new capacity which meet the licensing threshold relevant while utilising natural resources.

The EPA is the statutory authority for granting licences to installations undertaking industrial activities listed in Annex I of the Industrial Emissions Directive (IED) and to facilities carrying out waste disposal/ recovery operations listed in the Third and Fourth Schedule of the Waste Management Act 1996 as amended.

In addition, the wide range of potential waste and non-waste feedstocks to produce biomethane, bio-based fertilisers and bio-based products and the relevant regulations governing their use, and application need careful consideration as well as their potential impact and benefits to the environment from storage and processing during plant operations. The Circular Economy Act and the Bioeconomy Action Plan have the potential to positively interact with the Charter.

Opportunities to integrate with grass biorefining and/or manure processing should be progressed by AD developers of all plants where practical. Plants should hold a long-term

objective of operating a multi-output biorefinery with AD as a technology producing biomethane as the main product but over time progressing to producing a diverse and value-added portfolio of bio-based products.

Particular attention should also be paid to opportunities and potential of the co-benefits for emission reduction of bio-based products, soil quality, 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, incorporated or timed to produce feedstocks as a co-product. There is a need for policy coherence between the National Biomethane Strategy and the National Food Waste Prevention Roadmap and its hierarchy of activities.

3 Key Principles

3.1 Digestate Management

Sustainable biomethane production must also be cognisant of the digestate output after the AD process. The further expansion of biomethane production in Ireland will see the generation of increasing amounts of digestate. There is potential for quality digestate to bring added value to a biomethane project. Leveraging its significant advantages will yield benefits for farmers, local communities, and producers alike. From reducing reliance on high carbon footprint, costly and potentially harmful synthetic fertilisers to promoting effective soil management and restoration, bio-fertiliser and digestate offers a carbon neutral product and a number of distinct advantages for the Agriculture and Horticulture sectors in supporting sustainable production.

AD offers an opportunity to add value to animal slurry by processing it into a safe and valuable product (bio-based fertiliser/ ReNure) and ensures that nutrients can be fractionated and targeted. EU approval and implementation of the proposed ReNure amendment to the Nitrates Directive would allow for farms to use further processed digestate from an AD plant. Correctly managed and applied digestate strongly reduces greenhouse gas emissions in the food, feed, beverage and agricultural sectors. 1 tonne of artificial fertiliser replaced with digestate can save1 tonne of oil, 108 tonnes of water and 7 tonnes of CO2 emissions. AD with digestate and manure 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.

This has the potential to be instrumental in the improvement of water quality and mitigate the Nitrate Derogation.

The quality of digestate is determined by the characteristics of input substrates and the process parameters these are subjected to before, during and after digestion. It is essential that supports for the AD sector do not focus only on energy production but also on the production of high quality digestate. The introduction of a national or EU digestate quality standard in line with the EU ABP and Fertiliser regulations will help to protect and improve soils while managing biosecurity risks in the best interest of farmers and the public.

Digestate Management Charter Commitments:

No.	Commitment	Responsibility
1.	By-products of anaerobic digestion subject for use as an organic fertiliser on agricultural lands must adhere to all commitments governed under the Nitrates Directive (91/676/EEC) and subsequent European Union (Good Agricultural Practice for Protection of Waters) Regulations[1].	Farmers/ off takers of digestate
2.	The plant operator should ensure that whole digestate/ separated liquid fraction is stored in a leak proof tank and where possible the tank/ lagoon should be covered at the biomethane production facility. The farmer is responsible for the digestate when stored on his/her farm prior to land spreading and should implement regular inspections of storage tanks to detect any signs of wear, corrosion, or leakage.	Plant operator, plant developer, farmers/ off takers of digestate
3.	All new tanks must be compliant with the GAP Regulations and must be constructed according to the minimum specifications as provided under the Farm Building and Structure Specifications[2]. (Article 7 of the GAP Regulations 'Provision and management of storage facilities') (Capacity of storage facilities under Article 8).	Plant operator, plant developer, farmers/ off takers of digestate
4.	If there is variability in the feedstock, periodic sampling and testing must be conducted regularly to analyse nutrient levels (NPK). These up-to-date testing should be provided to farmers off taking the digestate.	Plant Operator

[1] https://www.gov.ie/en/publication/b87ad-nitrates-directive/

[2] https://www.gov.ie/en/collection/65f5b-tams-farm-building-and-structures- specifications/#structures-specifications

5.	The permitted period for spreading digestate is equivalent to that of the rules of spreading organic fertiliser as set out in Schedule 4 of the Nitrate Regulations. The opening date for spreading digestate will depend on the county that the farm is located in and the last permitted date to spread digestate is currently 30th of September in any given calendar year. Solid fraction digestate shall not be held in a field at any time during the periods specified in schedule 4.	Farmers/ off takers of digestate
6.	Any party receiving digestate should ensure they have up to date (within the last 5 years) soil sample results for the farm that the digestate is being spread on with at least 1 soil sample per every 5 hectares.	Farmers/ off takers of digestate
7.	Ensure the farmer that is receiving the digestate for land spreading is aware of the feedstock used to produce this digestate – especially important if ABP's are used at the AD site. Records of adequate pasteurisation of digestate should be available from the plant (where applicable depending on feedstock) DAFM documents cover this including Conditions for Animal By Product Processing Operations CN11, CN17	Plant operator
8.	Clear up to date record-keeping will be required for all digestate off-takers/ farmers to complete to ensure compliance.	Farmers/ off takers of digestate
9.	Ensure that digestate management practices are in line with the existing regulations and standards that farmers comply with, including Conditionality requirements, Good Agricultural and Environmental Condition (GAEC), Statutory Management Requirements (SMRs), nutrient management plans and environmental protection guidelines. This responsibility lies with the digestate off-takers/ farmers.	Farmers/ off takers of digestate
10.	The Fertilising Products Regulation only applies to bio-based fertilisers produced from digestate rather than digestate itself that is spread directly on land.	Plant operator

Digestate Management Charter Recommendations

No.	Recommendation	Responsibility
11.	Low Emission Slurry Spreading (LESS) techniques for application should be used, where practical.	Farmers/ off takers of digestate
12.	Application rate of digestate should be determined based on the crop requirements, soil testing results and recent analysis of digestate. This is best practice advice and responsibility lie with the digestate off-taker/ farmer.	Farmers/ off takers of digestate

3.2 Sustainable Feedstock Production

While food waste may be considered the optimal feedstock for AD, in Ireland, there is insufficient resource available to meet the required scale. The National Biomethane Strategy suggests that by 2030 Ireland's biowaste sector can contribute a total of up to 1 TWh of biomethane. Therefore, agricultural feedstocks will be key if Ireland is to meet the 2030 target of up to 5.7TWh of biomethane production per annum.

It is estimated that grass silage from 120,000 hectares and 20% of total winter cattle slurry will be required. Ireland has a distinct ability to grow high grass yields with minimal levels of chemical fertiliser required. The circular system of AD will allow for farmers to grow grass using digestate obtained from an AD plant in the local proximity. This digestate will serve as an alternative to chemical fertilisers, thus reducing the need for chemical fertilisers in agriculture. In order for biomethane to comply with the RED II minimum GHG saving levels, the majority of plants will also require the inclusion of cattle and pig slurry in the feedstock mix. Any use of urban wastewater material as a feedstock must be in accordance with the Waste Management (Use of Sewage Sludge in Agriculture) Regulations, 1998 and the Waste Management (Use of Sewage Sludge in Agriculture) Regulations, 2001.

Feedstock Production/ Management Charter Commitments:

No.	Commitment	Responsibility
13.	Ensure feedstock for AD plants does not come from areas of high biodiversity value, high carbon stocks or former peatlands.	Plant operator/ Farmers
14.	Any farmers supplying feedstocks are responsible for ensuring compliance with the Nitrates Regulations particularly regarding	Farmer

	the movement of slurry and other organic manures exported from farm holdings destined for AD plants.	
15.	Any farmers supplying feedstock are expected to align with the existing, Statutory Management Requirements and Good Agricultural and Environmental condition standards.	Farmer
16.	Minimise the use of chemical pesticides and fertilisers in feedstock production to reduce environmental contamination and promote soil health.	Farmer

Feedstock Production/ Management Charter Recommendations:

No.	Recommendation	Responsibility
17.	Where possible agricultural feedstocks should be sourced locally to reduce transportation emissions and support local agriculture in the locality of the AD plant.	Plant operator
18.	The incorporation of Red Clover and MSS or other suitable sustainable forage for feedstocks should be explored on a farm-by-farm basis.	Farmer
19.	Regular monitoring and testing of feedstocks by the AD plant operator is recommended.	Plant operator
20.	Implementation of adequate management systems to monitor quality, control and timely delivery of feedstocks alongside production and yield is recommended.	Plant operator

3.3 Plant Design & Operation

All plant operators must combine optimal performance to ensure commercial viability in conjunction with health and safety, environmental best practice and best available technologies to protect workers, the community and the environment. Owners and operators should continually seek to apply innovative technologies, continuous improvements, improve competitiveness while optimising plant performance to facilitate safe engineering and design principles and safe operating practices.

For biomethane to be classified as a zero-carbon renewable fuel, AD plants must be able to achieve increasingly strict sustainability criteria as outlined within the EU Renewable Energy Directive II ("RED") and RED III criteria to achieve certification of sustainability.

Plant Design & Operation Charter Commitments:

No.	Commitment	Responsibility
21.	Implement methane leakage mitigation programme in line with best practice guidelines[3] and best available technology, operated by trained and competent personnel.	Plant operator

Plant Design & Operation Charter Recommendations:

No.	Recommendation	Responsibility
22.	Implementation of an Energy Efficiency Assessment of plant operation is recommended including the setting of on-site energy reduction.	Plant operator
23.	Encourage operators to meet the majority of plant energy load from renewable energy sources where practical to reduce fossil fuel dependence and use renewable energy as much as possible to reduce the carbon intensity of the biomethane produced.	Plant operator/ AD developer

3.4 Community & Local Engagement

Anaerobic digestion is a well-proven, mature technology globally and in parts of Europe, but it is a relatively new and unknown renewable energy technology to many in Ireland. A successful biomethane industry will rely on good local stakeholder engagement, as well as the sharing of broader national information. A sustainable biomethane sector in Ireland can have multiple benefits across several important environmental quality parameters such as biodiversity, water and air quality. To achieve this, the transition must be made to a climate resilient, biodiversity-rich, environmentally sustainable, circular, and effectively communicated to local communities.

[3] As per the National Biomethane Strategy, the Biomethane Implementation Group will assess best practice guidelines around methane leakage suitable for the biomethane sector in Ireland.

Effective outreach and engagement with local stakeholders will be vital and involve building meaningful relationships, fostering trust, and ensuring alignment of the National Biomethane Strategy goals with community needs. Good communication between planning consultants, AD developers, biomethane producers, local feed stock suppliers and local communities will be crucial to meeting our climate targets and the creation of a viable diversification option for farmers.

Engaging with local communities early and often will be critical to ensuring successful planning applications for biomethane plants. Plant operators must be responsible neighbours, taking into account the needs and concerns of the communities near to them. An open, proactive and transparent approach to community engagement can help foster positive relationships.

The Biomethane Implementation Group will develop a Communications Strategy to help inform the public on delivery of the National Biomethane Strategy, help educate on the benefits of biomethane, and measures taken to ensure sustainable production. An online Information Hub will also be developed to promote the sharing of accurate information, accessible to all key stakeholders including members of the public.

Community & Local Engagement Charter Commitments:

No.	Commitment	Responsibility
24.	Develop a community engagement plan, setting out the scope and approach to open plant communication with the local community and providing opportunities for local feedback and meaningful engagement.	Plant developer / Plant operator
25.	Appoint a community liaison officer/representative to act as the key point of contact available to develop relationships with the local community and the organisations that represent them.	Plant developer / Plant operator

4 Innovation

The mission of the National Biomethane Strategy indicates it will align with the development of a circular economy and bioeconomy. This alignment can contribute positively to the sectoral emissions ceiling for agriculture, the decarbonisation of Ireland's energy mix and also new innovative opportunities for resource-smart processing of local biomasses, i.e., cascade processing, offering added value innovative opportunities in the rural economy and

developing innovation as a driver of sustainability. In accordance with the cascade principle, supports for biomethane production from feedstocks suitable for biorefinery applications should not be set at levels which could economically preclude access to these feedstocks by a biorefinery. Stimulating energy recovery from feedstocks suitable for AD should not be at the expense of prior extraction/production of high-value chemicals or materials but should complement biorefining processes by utilising their final residues in AD.

A successful approach to development of the biomethane sector should align with circular economy and bioeconomy development and ensure consideration of innovation in terms of for example the following:

- Feedstock pre-treatment and post-treatment including separation and conversion technologies for livestock slurry, anaerobic digestate and grass for use in AD and biorefinery[4].
- AD process innovation including the production of high-value organic acids and biogas from feedstock[5].
- AD represents an immediate and cost-effective means of achieving the removal of CO2 from the atmosphere while simultaneously preventing CO2 emissions through reduced fossil fuel consumption, through either development of BECCS (bioenergy carbon capture and storage) or BECCU (bioenergy carbon capture and utilisation)[6].
- Developing feedstock supply chains into biomethane and bioeconomy value chains, including developing cooperation activities and networks is considered valuable as an innovative resilience and adaptation strategy to support biomethane development. Modern separation and conversion technologies can process diverse biomass fractions (e.g., from various agricultural and forestry sources) and bio-based residues of varying qualities to produce multiple bio-based products (e.g., electricity, heat, biomethane, bio-based fertilizers, bio-based materials for construction, ingredients for the food and feed). This "portfolio diversification" of the processing of feedstock can enhance innovation and resilience though the development of a range of diversified income streams[7].

[4] Rural BioReFarmeries - Small-scale Circular Green Biorefineries for increasing farmer sustainability and competitiveness and building resilient rural areas - Rural BioReFarmeries

[5] Dynamic anaerobic digestion-based biorefineries for on-demand renewable energy and bioproducts in a circular bioeconomy Trends in Biotechnology, Month 2025 https://doi.org/10.1016/j.tibtech.2025.01.005

[6] CABBBIE - MaREI

[7] Synergies for bioenergy supply chains in bioeconomy networks – Bioenergy (ieabioenergy.com)

5 Governance & Review

This charter has been prepared by the Department of Agriculture, Food and the Marine in partnership with the Department of Climate, Energy and the Environment, along with contributions from members of the Biomethane Implementation Group.

Certification and verification of sustainability is carried out by approved and accredited bodies such as ISCC, Red Cert and SURE recognised by the EU and Global carbon accounting bodies such as WRI. Gas off takers will require certified sustainably produced biomethane.

This charter will apply to plants that are in receipt of any form of public funded support or operating under a National AD/Biomethane support scheme and producing renewable gas eligible to generate certificates in an obligation scheme. As part of these schemes' inspections are regularly carried out on behalf of the paying agency / scheme authority. The inspecting authority may request the AD plant to demonstrate that it is complying with the various elements and requirements outlined in the Biomethane Environmental Sustainability Charter.

DAFM as the paying agency of direct payments for farmers undertakes cross compliance inspections. In addition, DAFM carries out nitrate's inspections on behalf of the Local Authorities.

It is recommended that this charter be reviewed annually (until 2027 post-RED III implementation and then every 18 months) by the Biomethane Implementation Group, and upon review, future revisions of the charter should be presented to the Heat & Built Environment Taskforce.

6 Abbreviations

Abbreviation	Definition
ABP	Animal By-Products
AD	Anaerobic Digestion
BAT	Best Available Techniques
DAFM	Department of Agriculture, Food and the Marine
DCEE	The Department of Climate, Energy and the Environment
EPA	Environmental Protection Agency
GAEC	Good Agricultural and Environmental Condition
GHG	Greenhouse gases
IED	Industrial Emissions Directive
LESS	Low Emission Slurry Spreading
MRV	Monitoring, Reporting and Verification
RED	Renewable Energy Directive
RHO	Renewable Heat Obligation
RTFO	Renewable Transport Fuels Obligation
SMR's	Statutory Management Requirements

7 Glossary

Term	Definition
Anaerobic Digestion	The conversion of feedstock (any organic non-woody material) by micro-organisms in the absence of oxygen into biogas and digestate.
BAT (Best Available Techniques)	EPA-defined standards for minimizing environmental impact (e.g., covered digestate tanks).
Biomethane	Biomethane is a carbon-neutral renewable gas made from farm and food waste through a process known as anaerobic digestion.
Biofertiliser	Product, consisting of CMC 4 and or CMC 5 which has undergone sufficient further processing to meet the relevant requirements of PFC 1A or PFC 1B
Biorefining	Biorefining is a transformation process of biomass resources that aims to optimise the use of all components of the plant into a wide range of products
Digestate	A by-product of anaerobic digestion, which can serve as an alternative to chemical fertilisers. Semisolid or liquid material resulting from an AD process, and any subsequently separated fibre or liquor fractions.
LDAR (Leak Detection and Repair)	Regular surveys using infrared cameras or laser sensors to identify/fix methane leaks.
MRV (Monitoring, Reporting, Verification)	A system to track methane leaks, emissions, and mitigation efforts via sensors, audits, and regulatory reporting.
Organic Fertiliser	Materials of animal or plant origin used to maintain or improve plant nutrition and the physical and chemical properties and biological activity of soils, either separately or together, they may include manure, digestive tract content, compost and digestate
ReNure	Recovered nitrogen from manure