MEMO

Office of Environmental Sustainability

To: EPA Board	**From**: Anne Lucey (CEWA), David Matthews (WEBS), Niamh O'Donoghue & Seán O'Donoghue (ICER).	
Date: 24 September 2024	**Meeting Date:** 01 October 2024	**No. of Pages:** 15

Approved for Board by: Warren Phelan

Title/Subject: Application of Activity Class 5.12 (The production of organic chemicals) of the First Schedule of the EPA Act 1992 as amended, to Anaerobic Digestion Activities.

Cross Office Implications: Yes - OEE

Executive Summary:

To-date, anaerobic digestion (AD) plants have been licensed as a waste activity as feedstocks contain waste. The National Biomethane Strategy, published in May 2024, identifies a wide range of potential feedstocks for anaerobic digestion that may not be classified as waste. If waste is not utilised as a feedstock, then a waste authorisation would not be required. This memo sets out four recommended authorisation scenarios for the licensing of anaerobic digestion plants utilising different feedstocks incorporating waste and non-waste or waste exempted from requiring a waste authorisation. This includes the application of Class 5.12 (The production of organic chemicals) which is applicable to the production of biomethane. The memo recommends that:

1. Class 5.12 is applied when the main class of activity is AD, utilising non-waste /exempted waste feedstocks only, with a plant capacity exceeding 100 tonnes per day.
2. Any AD plant that utilises a waste feedstock (in part or in whole), when AD is the main class of activity, should only be subject to the waste activity classes 11.4(b)(i) & 11.4(c) of the First Schedule of the EPA Act 1992 as amended, or

the relevant class of activity for a Waste Licence or Waste Facility Permit /Certificate of Registration under waste management legislation.

3. Where AD is not the main class of activity but is identified as a Best Available Technique for the sector, authorise and control AD operations under the main activity sector, applying class 5.12 on a case-by-case basis.
4. Other potential scenarios should be considered on a case-by-case basis where AD is not the main class of activity.
5. When applying Class 5.12, the AD plant should be operated and controlled in accordance with the best available techniques (BAT) conclusions for waste treatment only. No associated BAT conclusions for the production of organic chemicals should be applied.

Recommendation:

The Board of the Agency are asked to Approve the proposed approach to licensing of anaerobic digestion plants.

Introduction

Following an EPA query, regarding the licensing of biomethane production via anaerobic digestion (AD) of non-waste feedstocks, to the Industrial Emissions Directive Team of the European Commission Directorate-General for Environment (EC DG Env), it was confirmed that the production of biomethane is covered by the Industrial Emissions Directive (IED) activity 4.1 *'Production of organic chemicals'*, as biomethane is an organic chemical.

Under IED activity 4.1, production means "…production on an industrial scale by chemical or biological processing…" and guidance[1] (Annex 1 Q&A) has been provided by the EC DG Env on the CIRCABC[2] platform in relation to the determination of industrial scale. It is up to the EPA, as the national competent authority, to determine whether production is on an industrial scale utilising the various criteria described in the guidance. If production is deemed not to be on an industrial scale, then IED activity 4.1 would not be applicable.

This memo seeks the approval of the Board for the licensing of AD plants under four different scenarios, including the application of IED activity 4.1 which is transposed as Class 5.12 of the First Schedule of the EPA Act 1992 as amended as follows:

> *"5.12 The production of organic chemicals, such as:*
>
> *(a) simple hydrocarbons (linear or cyclic, saturated or unsaturated, aliphatic or aromatic),*
>
> *(b) oxygen-containing hydrocarbons such as alcohols, aldehydes, ketones, carboxylic acids, esters and mixtures of esters, acetates, ethers, peroxides, epoxy resins,…"*

Background

The National Biomethane Strategy[3] (co-developed by the Department of Agriculture, Food and the Marine (DAFM) and the Department for Environment, Climate and Communications (DECC)) was published on 28 May 2024. The strategy aims to

[1] https://circabc.europa.eu/ui/group/06f33a94-9829-4eee-b187-21bb783a0fbf/library/cbcfa4fc-cb8e-4cd7-bf7a-cbba10c28fb4?p=1

[2] https://circabc.europa.eu/ui/welcome

[3] gov - National Biomethane Strategy (www.gov.ie)

produce biomethane, up to a scale of 1.0 TWh per annum by 2025 and 5.7 TWh per annum by 2030, through the development of between 90 – 250 AD plants.

To date, as wastes are used in part or in whole in the digestion process, the EPA has authorised six AD plants with an Industrial Emissions (IE) Licence (see Appendix 1) under waste activity class 11.4(b)(i) & 11.4(c) of the EPA Act as follows:

> "*11.4(b) Recovery, or a mix of recovery and disposal, of non-hazardous waste with a capacity exceeding 75 tonnes per day involving one or more of the following activities, (other than activities to which the Urban Waste Water Treatment Regulations 2001 (S.I. No. 254 of 2001) apply):*
> *(i) biological treatment;*
>
> *(c) Notwithstanding clause (b), when the only waste treatment activity carried out is anaerobic digestion, the capacity threshold for that activity shall be 100 tonnes per day*."

AD plants, utilising waste feedstocks, that fall under the capacity threshold for an IE licence would be subject to a Waste Licence under the Waste Management Act 1996 as amended, or a Waste Facility Permit /Certificate of Registration under the Waste Management (Facility Permit and Registration) Regulations 2007 as amended, depending on waste feedstock types, intake tonnage and on-site storage quantities of feedstocks and digestate.

The National Biomethane Strategy is agri-centric and identifies the use of some non-waste or potentially waste exempted from requiring a waste authorisation and pre-application meetings with project developers indicate an intention to exclusively use non-waste/exempted waste as feedstocks. Such an AD operation would not require a waste authorisation. AD is also utilised in other sector installations such as the food and drink industry and more sectors may utilise AD to valorise wastes and non-waste /exempted wastes and reduce carbon impacts.

The memo sets out four plant configurations for which potential authorisation scenarios are considered under chemical activity class 5.12 and waste activity class 11.4(b)(i) and class 11.4(c). A recommended authorisation approach is provided for each of the four plant configurations.

Previous Board Paper	Meeting Date	Board Recommendation
OES memo on consultation submission to Ireland's Draft National Biomethane Strategy	05/03/2024	Noted
OEE memo on Anaerobic digestion and existing environmental issues	30/07/2024	Noted

Discussion

1. Authorisation scenarios

A number of potential scenarios exist for the authorisation of AD plants, under chemical activity class 5.12 and waste activity class 11.4(b)(i) and class 11.4(c), depending on the use of waste or non-waste /exempted waste feedstocks, and whether or not AD is the main site activity. These are outlined under four plant configurations in the following table, along with a number of considerations. A recommended authorisation approach is provided for each plant configuration.

Table 1: Authorisation options for AD plants using waste and non-waste /exempted waste feedstocks.

Plant Configuration	Authorisation Scenario	Recommended Approach
1. Main activity: AD plant utilising waste feedstocks (in part or in whole)	**Option A: Apply both waste activity 11.4(b)(i) & 11.4(c) and chemical activity class 5.12, or** **Option B: Apply waste activity 11.4(b)(i) & 11.4(c) only.** **Considerations:** • Need to determine if individual plant production is on an industrial scale in order to apply chemical activity class 5.12. • Existing 6 licensed sites (as per Appendix 1) only have waste activity 11.4(b)(i) & 11.4(c) authorising the AD operation. • If applying both waste and chemical activity classes, applicable BAT requirements to waste and chemical sectors may include: ○ Large Volume Organic Chemical sector BREF [4] and CID [5] – the BREF refers to AD for waste water treatment but contains no specific controls for AD and refers to the Common Waste Water and Waste Gas	**Option B: Apply waste activity classes 11.4(b)(i) & 11.4(c) only.** Rationale: Utilising waste feedstock requires the applicable waste activity & AD is appropriately controlled by the Waste Treatment BAT conclusions. No additional control provided under Class 5.12 when utilising Waste Treatment BAT.

[4] https://eippcb.jrc.ec.europa.eu/sites/default/files/2019-11/JRC109279_LVOC_Bref.pdf

[5] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32017D2117

Plant Configuration	Authorisation Scenario	Recommended Approach
	Treatment/Management Systems in the Chemical Sector (CWW) BREF as follows. ○ CWW BREF [6] and CID [7]- addresses AD in the context of waste water sludge treatment technologies but does not provide specific controls for AD. ○ Common Waste Gas Management and Treatment Systems in the Chemical Sector BREF [8] and CID [9] – does not have any AD references. ○ Waste Treatment BREF [10] and CID, [11] which covers AD, is the most appropriate BAT to apply. • It may be unfairly onerous to apply BAT for both sectors. The Waste Treatment BAT controls are more appropriate for AD than the controls specified in BAT for chemical activity class. As the competent authority, Article 14 (6) of the IED [12] could be used to apply the Waste Treatment BAT only and exclude the chemical sector BAT entirely. • Currently only one known case in the EU of an AD plant with a chemical activity class. • Non application of an applicable IED activity and applicable BAT if not applying class 5.12. • Potential environmental impacts if not applying chemical activity class. • Lack of consistency if chemical activity class is only applied to non-waste /exempted waste feedstocks.	

[6] https://eippcb.jrc.ec.europa.eu/sites/default/files/2019-11/CWW_Bref_2016_published.pdf

[7] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016D0902

[8] https://eippcb.jrc.ec.europa.eu/sites/default/files/2023-01/WGC_BREF_2023_for_publishing%20ISSN%201831-9424_final_1_revised.pdf

[9] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32022D2427

[10] https://eippcb.jrc.ec.europa.eu/sites/default/files/2019-11/JRC113018_WT_Bref.pdf

[11] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018D1147

[12] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32010L0075

Plant Configuration	Authorisation Scenario	Recommended Approach
2. Main activity: AD plant utilising <u>non-waste /exempted waste</u> feedstocks only	**<u>Option A</u>: Apply chemical activity class 5.12, or** **<u>Option B</u>: Do not apply chemical activity class 5.12.** **Considerations:** • EC DG Env have confirmed that class 5.12 is applicable to the production of biomethane. • Not applying chemical activity class 5.12 would result in AD plants utilising non-waste /exempted waste feedstocks not operating under the controls of an environmental licence. • The use of non-waste /exempted waste feedstocks to avoid a waste authorisation could potentially be adopted as an approach in the sector. • Other EU members not currently authorising non-waste /exempted waste feedstocks with class 5.12 (only one known case). • Need to determine "industrial scale". • Use Article 14 (6) of the IED to apply only Waste Treatment BAT and exclude chemical sector BAT entirely.	**Option A: Apply chemical activity class 5.12.** Rationale: Need to apply the applicable chemical activity class to provide an appropriate level of environmental protection to an AD plant producing biomethane on an industrial scale.
3. Main activity: Other sector activity, but AD is identified as a BAT Technique for the sector.	**<u>Option A</u>: Authorise and control AD operations (where AD operations are not determined to be a Class 11.1 waste recovery activity) as part of the main sector activity and associated BAT conclusions where AD is identified as a BAT technique. In cases where biogas production is deemed to be on an industrial scale, apply chemical activity class 5.12 on a case-by-case basis.** **Considerations:** • Waste Class 11.1 of the First Schedule of the EPA Act applies to the recovery or disposal of waste in a facility, within the meaning of the Waste Management Act 1996 as amended, when the facility is connected or associated with another activity specified in the First Schedule. If class 11.1 is applied, then a waste recovery activity is already considered to be taking place.	**Option A: Authorise & control AD under relevant sector BAT for main activity where incorporated, except on a case-by-case basis when production is deemed to be on an industrial scale.** Rationale: AD is identified as a BAT technique and controlled under relevant sector BAT when AD is utilised for on-site activities. When biogas is produced on an industrial scale, need to consider applicability of class 5.12 on a case-by-case basis depending

Plant Configuration	Authorisation Scenario	Recommended Approach
	• A small no. of licences e.g., in the food and drink sector have AD plants without any additional activity class being applied to the AD plant. These primarily relate to treatment of on-site generated waste effluent e.g., Bulmers P0443-02 [13]. • BAT conclusions [14] for the food, drink and milk industries identify AD as a technique to increase resource efficiency (BAT 10), as a secondary treatment technique to reduce emissions to water (BAT 12) and as a technique for the recovery and (re)use of yeast after fermentation (BAT 19) to reduce the quantity of waste sent to disposal. • BAT conclusions [15] for the intensive rearing of poultry or pigs identifies AD as a technique for on farm processing of manure (BAT 19). • Need to determine if biogas is utilised solely on-site or if it is exported to the electricity or gas grid following CHP plant or on-site/off-site clean-up of biogas to biomethane. • If exported, need to determine if production is on an industrial scale in order to apply chemical activity class 5.12.	on whether exporting biogas/biomethane or electricity off-site or utilising for on-site uses only.
4. Other main activity, but AD plant operating on-site to treat on-site/ imported waste or non-waste /exempted waste feedstocks.	**Option A: Apply either waste activity class 11.1 or 11.4(b)(i) & 11.4(c) or chemical activity class 5.12 to the AD plant, pending waste or non-waste /exempted waste feedstocks on a case-by-case basis, where not covered by sector BAT for main activity.** **Considerations:** • Is the AD plant capacity exceeding 100 tonnes per day for waste feedstock or achieving industrial scale for non-waste /exempted waste feedstock. • Recovery of waste is a waste activity unless an exemption applies. • Some on-site wastes/residues may potentially achieve end-of-waste/by-product status prior to use in on-site AD plant. • Environmental impact risks if AD not adequately controlled.	**Option A: Apply waste or chemical activity classes on a case-by-case basis.** Rationale: A case-by-case approach is required to address different scenarios which may arise in the future.

[13] https://epawebapp.epa.ie/terminalfour/ippc/ippc-view.jsp?regno=P0443-02

[14] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019D2031

[15] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32017D0302

2. Production on an industrial scale

The CIRCABC platform provides answers given by EC DG Env on the implementation of the IED, which helps to clarify the meaning and intention of the text within the IED.

It states that the term biological processing "...implies that transformation takes place during the production process involving the use of a living organism e.g. physiological process, cellular differentiation, fermentation, fertilisation, germination, tropism, hybridisation, metamorphosis, morphogenesis, photosynthesis". It also notes that given the very large number of possible chemical and biological processing scenarios that could exist, "it remains for the competent authorities to make an informed and justified judgment on whether or not a particular installation falls under the scope of the IED".

As regards "production on an industrial scale", it notes that:

- The scale of chemical manufacture can vary from a few grams of a highly specialised product, to many tonnes of a bulk chemical product;
- Factors such as the nature of the product, the industrial character of the plant and machinery used, production volume, commercial purpose, production solely for own use, environmental impact may be considered when determining whether production is "on an industrial scale".
- The fact that the activity is carried out for "commercial purposes" may be a strong indicator of "industrial scale", even if the material is an intermediate product and therefore not itself traded. "Commercial purposes" implies that the activity is being undertaken principally as a remunerated business activity.
- Non-commercial activities producing chemicals exclusively for their own consumption – for example domestic, academic or laboratory activities – may not be covered.
- It may also be important to consider the potential environmental impact of a production sequence. If there is no significant effect on the environment from the process, it may be disproportionate to consider this activity to be production on an "industrial scale". The potential environmental effect would be dependent on the quantities produced and technology used.

Given the environmental impacts of an AD plant utilising waste and non-waste /exempted waste feedstocks will be largely similar, vis-à-vis feedstock storage and handling, biogas on-site usage in CHP, biogas flaring, biogas upgrading, digestate storage, odour, noise, leachate generation, treatment and discharge, stormwater discharges and accidents/emergencies, the capacity threshold exceeding 100 tonnes per day, as applied to waste activity waste classes 11.4(b)(i) & 11.4(c), can be used as an industrial scale measure for plants utilising non-waste /exempted waste feedstocks only. AD plants utilising non-waste /exempted waste feedstocks and falling under the capacity threshold of more than 100 tonnes per day would not be licensed by the EPA and instead would be subject to relevant environmental authorisations, where necessary, issued by Local Authorities for discharges to air, sewer or surface water, etc.

3. Practices in other Member States

OES queried the authorisation of AD utilising non-waste /exempted waste feedstocks in other member states and those that responded indicated that AD plants were only controlled where waste was digested. In most scenarios waste is being accepted. However, they acknowledged the potential applicability of IED Activity 4.1 of Annex I of the IED (the equivalent of Class 5.12 in the First Schedule of the EPA Act) to anaerobic digestion and have expressed interest in the EPA's approach on this issue.

In September 2024, the EC DG Env circulated a background paper [16] from the Danish EPA, dated 11 September 2024, in relation to the determination of IED activities from biogas plants. The paper notes the purpose of biogas plants changing from plants to treat manure to focusing more on the production of bio-methane to be sold to the gas network. The paper states that the Danish EPA determined the production of e-methane (methane produced from CO_2 and hydrogen by biological processing) as covered by IED activity class 4.1a and methanol as covered by activity 4.1b (biological or chemical processing), further highlighting the evolution of AD plants into other licensable activities.

[16] Paper provided to the participants and observers of the Members and Observers of the Industrial Emissions Expert Group – available from OES.

4. Implementation of Class 5.12

The Agency in its submission during the consultation period on the draft National Biomethane Strategy highlighted that Class 5.12 may be a relevant class of activity in licensing of AD plants. DAFM and DECC are now moving to the implementation phase of the National Biomethane Strategy and are looking to establish a Biomethane Implementation Group. The EPA have been asked to join the group to contribute/lead on a range of tasks, including an online information hub that includes environmental aspects. The application of Class 5.12, along with the classification of feedstocks as waste or non-waste /exempted waste will need to be included as part of this implementation phase.

Recommendation

The Board of the Agency are asked to Approve the proposed approach to licensing of anaerobic digestion plants as follows:

1. Class 5.12 is applied when the main class of activity is AD, utilising non-waste /exempted waste feedstocks only, with a plant capacity exceeding 100 tonnes per day.
2. Any AD plant that utilises a waste feedstock (in part or in whole), when AD is the main class of activity, should only be subject to the waste activity classes 11.4(b)(i) & 11.4(c) of the First Schedule of the EPA Act 1992 as amended, or the relevant class of activity for a Waste Licence or Waste Facility Permit /Certificate of Registration under waste management legislation.
3. Where AD is not the main class of activity but is identified as a Best Available Technique for the sector, authorise and control AD operations under the main activity sector, applying class 5.12 on a case-by-case basis.
4. Other potential scenarios should be considered on a case-by-case basis where AD is not the main class of activity.
5. When applying Class 5.12, AD plant should be operated and controlled in accordance with the BAT conclusions for waste treatment only. No associated BAT conclusions for the production or organic chemicals should be applied.

Anne Lucey

Date: 24 September 2024

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Appendix 1 – Anaerobic Digestion plants issued waste authorisations by EPA to date.

Reg No	Name	Date issued	Feedstock	How biogas produced is used	Licence type	Class of activity
P0986-01	Timoleague Agri Gen Limited	15/11/2016	Pig slurry; seaweed; dairy flotation sludge; feedmill, fruit and vegetable residuals; Slurry from fish manufacturing; pig and cattle paunch; fat trap waste; draff from beer production; and bread. 48,500tpa	Purified and introduced to CHP plant to produce approximately 1.1MW of electricity and 1.25MW of heat. The electricity will be exported off-site to a dedicated grid connection on a continuous basis. Electricity produced will also be used at the installation.	IE	11.4 (b)(i)/(c)
[redacted]					IE	11.4(b)(i) & 11.4(c) (Waste transfer and sludge drying activity also on-site under Class 11.1)
					IE	11.4(b)(i) & 11.4(c)
					IE	11.4(b)(i) & 11.4(c)

Reg No	Name	Date issued	Feedstock	How biogas produced is used	Licence type	Class of activity
[redacted]						(Also 11.1)
					IE	11.1 (Part of a pig rearing (Class 6.2) activity)
					IE	11.4(b)(i) & 11.4(c) (Composting activity also present)

Reg No	Name	Date issued	Feedstock	How biogas produced is used	Licence type	Class of activity
[redacted]						