

Department for Energy Security and Net Zero

Call for evidence: Future policy framework for biomethane production

IGEM Response – April 2024

The Institution of Gas Engineers & Managers (IGEM) is the UK's Professional Engineering Institution, supporting individuals and businesses working in the global gas industry. IGEM was founded in 1863 with the purpose of advancing the science and relevant knowledge of gas engineering for the benefit of the public.

As a not-for-profit, independent organisation IGEM acts as a trusted source of technical information, guidance and services for the gas sector. In today's net zero context, IGEM is focused on engineering a sustainable gas future – we do this by:

- Helping our members achieve and uphold the highest standards of professional competence to ensure the safety of the public
- Supporting our members in achieving their career goals by providing high quality products, services and personal and professional development opportunities
- Acting as the voice of the gas industry when working with stakeholders to develop and improve gas policy.

Our role across various industry and governmental groups sees us working directly with gas network companies, manufacturers, consultants, contractors, safety experts, academia, regulators, policy advisors and policy makers, to assess the evidence base and develop informed recommendations on the future of the gas grid.

We welcome the opportunity to respond to this call for evidence, and following consultation with IGEM Members and stakeholders, we aim to represent their collective views. Please find our responses below to the questions most relevant to the groups we aim to represent:

Consultation questions:

Chapter 1: Design and scope of a new framework

1. a) Do you agree with the principles as a basis on which to develop the policy framework?

Yes, IGEM support the policy framework principles of sustainability, security, adaptability, commercial viability and compatibility. We commend the government for publishing a broad framework that demonstrates that industry feedback is being carefully considered within policy development.

Repurposing the gas network for use with sustainable gases offers a low regrets approach to energy decarbonisation that delivers inherent flexibility, storage capacity and boosts energy security. Biomethane is an established technology that can contribute to medium term decarbonisation targets as other emerging technologies are being developed.

Consultation with our members shows broad support for acceleration in biomethane connections to the distribution network, as well as the transmission network, and to establish a sustainable approach that sees biomethane and hydrogen working together to help deliver net zero.

b) Are there any factors missing?

No response

2. Are there any other important current or future barriers to market growth not mentioned in Chapter 1 and what actions could the government or industry take to address them?

Please provide supporting evidence, including any that highlights the scale of the impact.

Demand for Biomethane: Some support has been shown for the government to boost demand through mandating major gas users to, over time, increasingly source their gas from low-carbon alternatives like biomethane and hydrogen. This approach, aimed at stimulating and creating certainty around demand, is seen to complement existing supply-side initiatives such as the Green Gas Support Scheme (GGSS).

Future of the Gas Network: There is support for government to reaffirm its position on the continued importance of the gas network as a key player in the decarbonisation of the energy system. The government's explicit support for the future role of the gas network would reassure the biomethane sector, as millions of homes and businesses will continue to rely on gas for heating and industry on low carbon gas, to support industrial processes and power generation.

Policy Stability and Financing: There is strong support for the government to provide long term, stable schemes that are not time limited. This approach will encourage the growth of investment, developers and the skills necessary for sustained expansion of the market.

The industry is very diverse and businesses can vary in their size, geographical location and the type of feedstock they use. A 'one size fits all' approach to policy support will hinder market growth therefore a suite of policy levers should be made available to reflect this market diversity. Plants benefit from 15-20 year commitments to mitigate operational and investment risks, and would therefore benefit from long term support schemes that are not time-limited. This will improve investor confidence and support market growth.

Long term support schemes, such as those provided through the Emissions Trading Scheme (ETS) and Contracts for Difference (CFDs) are recommended to encourage sustainable growth, alongside schemes such as, UK Allowance Credits and Supplier Obligations (SOs). The government should ensure that schemes like the Renewable Transport Fuel Obligation (RTFO) and Green Gas Support Scheme (GGSS) do not undermine the long-term role of biomethane.

There is some support for the review of the Green Gas Support Scheme (GGSS), looking at whether it has been inadvertently designed to limit the scale of AD plant production (when compared to larger European counterparts) in order to achieve specific tariff rates. Also, the issue of the scheme restricting support to only new builds. This limits the scheme's effectiveness by discouraging upgrades or expansions of existing facilities.

Gas Network Capacity: There is recognition that grid capacity issues, particularly in network areas with low seasonal demand, must be addressed and various operational changes are needed to support this. These include reverse compression and other technical upgrades such as injection hubs, modern metering and smart controls. Gas network companies are leading on various innovation projects that are aiming to address these issues. IGEM would be happy to signpost you to relevant project stakeholders for more information.

The industry is working hard to support additional connectivity of biomethane to the gas grid, and alongside that there are calls to explore storage capacity options for biomethane. There is very little biomethane storage capacity in the UK currently, which means unless the gas grid

has immediate capacity availability, the biomethane produced cannot be used – this is a lost opportunity.

Planning, Permitting and Standards: It has been raised that addressing barriers across planning, permitting and financing will support growth in the market, at a lower cost to government. For example, providing more guidance to those applying for planning permission to avoid the delays associated with rejected applications; maintaining alignment with EU standards for AD plant equipment to avoid creating obstacles for equipment makers; simplifying sustainability criteria and avoiding overly bureaucratic checks; providing more guidance to planning authorities and considering measures to limit “nimby-ism” for AD plants.

Regulations: With regards to propanation, there is broad recognition that changes are needed to the Gas Calculation of Thermal Energy Regulations (GCoTER), so that the use of propane can be eliminated and the potential for biomethane to contribute towards emissions reduction can be maximised. It would be appropriate for the government to reinforce the message to industry and the regulator that a solution to the propanation issue is essential. This will open up the potential for much higher volumes of biomethane, but also hydrogen in the gas network.

The government rightly acknowledge that biomethane is unfairly penalised within the ETS, as it is charged the same ETS cost as natural gas. There are calls to introduce a simply offsetting measure, such as providing biomethane producers with allowances that offset this cost, outside of the scheme.

3. In your view, what are the most important barriers to market growth that need to be addressed and why? Please provide supporting evidence.

Market uncertainty: As alluded to above, lack of clarity on the future of the gas network, the gas network’s capacity and the demand for biomethane all contribute towards an environment of market uncertainty. There are calls for the government to help address these barriers by providing clear signals to industry and the regulator on its position and the policies designed to address the barriers.

The Gas (Calculation of Thermal Energy) Regulations: There are calls for changes to regulations, without which the growth and potential of the biomethane market will be severely limited. Biomethane is an established technology, with the flexibility for multiple end-uses and provides a low-risk pathway to gas decarbonisation, even with market uncertainty. Biomethane has already provided the UK with significant carbon savings and is actively contributing towards our carbon emissions targets. There is consensus that not maximising the potential for biomethane within the gas grid is a lost opportunity for the UK. A critical enabling factor is eliminating the need for propanation. There is also a call for changes to the gas settlement system, through changes to the regulations, which in turn helps address the issue of propanation.

4. Are there any production methods that could have significant potential which are not included in Chapter 1?

No response

5. Please provide evidence related to the outlined assessment criteria for any of the production technologies listed in Chapter 1 (or for any additional technologies not included).

Discussions with our stakeholders indicate the need for innovation in emerging technologies like

e-methane. There are recommendations that new technologies, such as using green hydrogen for biomethane production, receive the same support as traditional AD methods to prevent unintended barriers as these technologies advance. With further innovation support targeted at technologies in early development stages or those requiring more significant financial aid. Additionally, green hydrogen production for e-methane has been highlighted as providing potential, given the possibility of gas network conversation to hydrogen in the future and biomethane offering a potential source of hydrogen. Working in an integrated way, these technologies provide whole system benefits through their capacity to support energy storage and flexibility.

There are also calls for government to support schemes to be technology neutral and enable the market to find the most optimal solutions for both producers and consumers – provided clear standards are defined.

Chapter 2: The role of biomethane in meeting net zero and energy security

6. What are the most important end-uses for biomethane in the transition to net zero by 2050, and what are the implications for the framework? Please provide supporting evidence where possible.

As the call for evidence emphasises, biomethane provides valuable optionality and versatility in terms of end uses. However, there are calls for government to avoid linking biomethane production support to specific end-uses due to the uncertainty in the technology mix of the future net-zero energy system. We urge government to develop the framework with the primary aim of increasing the volume of green gas in the system to replace natural gas. Future policy decisions regarding end-uses such as industrial decarbonisation, power generation, domestic and commercial heating and transport, will determine how biomethane is best utilised. That being said, IGEM recognises the value that biomethane can provide across all of these end-uses.

It has also been raised that the key purpose of the energy system transition is to reduce its carbon impact as soon as possible, in support of our 2050 net zero target, and that means acting now to minimise our cumulative carbon emissions. Biomethane production offers an established technology that has already made, and will continue to make, a meaningful impact to the UK's carbon footprint.

7. What might be the impact on the UK biomethane market if government were to set a form of biomethane volume target? Please provide evidence.

We see overall support for a biomethane volume target. Based on the experiences in other sectors of the UK energy industry, setting a specific production volume target for biomethane could be beneficial. Setting volume targets has been a key strategy in managing the transition to renewable energy sources, like wind and solar, and has helped define clear goals, offer market certainty, mobilise greater investment and drive technological innovation and infrastructure upgrades. The biomethane market can benefit from a similar approach, provided that the right policy and funding levers are put in place to support it.

Concerns have been raised that the government has underestimated the potential of biogases and the speed with which the sector can expand. There is support for a volume target more ambitious than 30TWh by 2050, that maximises the potential of all feedstocks across the UK. The Anaerobic Digestion and Bioresources Association (ADBA) indicate that biogas has the potential to deliver ~57TWh by 2030 when all available feedstocks are utilised. This approach will better enable a market where biomethane, combined with carbon capture and storage, can

support peak power requirements by 2050, and alleviate pressure on the electricity grid capacity.

To encourage faster and more consistent market growth, there is support for the introduction of an interim production target – this closer target date will give a better indication of the pace of expected market growth, the level of confidence from government and the anticipated pathway between now and 2050.

Ambitious biomethane targets opens up the potential for more hybrid heating systems, with boilers burning biomethane used in conjunction with heat pumps powered by renewable electricity. IGEM's industrial connections research¹ shows the scale and potential for biomethane across the UK. There are currently 124 biomethane sites connected to the gas grid, with 29 further sites in the connections process. The renewable gas capacity from connected sites is 10.1 TWh – enough to heat over 840,000 homes. Including connecting sites, the total capacity will be 14.5 TWh – enough to heat 1.2m homes, or if maximising the potential for hybrid heating systems, with boilers burning biomethane used in conjunction with heat pumps powered by renewable electricity, biomethane can help heat up to £6m homes – 22% of all homes in the UK.

8. What are the benefits and risks associated with the different approaches (to Time Horizon, Scope and Volume) listed under the production targets section?

There is support for a long term, UK wide target that covers total production regardless of production method – with interim targets to provide a better indication around the expected rate of growth.

9. To what extent will the framework described in Chapter 1 help support an industry that can attract investment and produce enough biomethane to meet the strategic aims in Chapter 2?

There is confidence that the framework can deliver for the market, provided that supporting policies are consistent, robust and volume targets are ambitious.

Chapter 3: Accelerating growth of the sector

[no response to questions within this section – these are better suited to be answered by biomethane producers]

10. What is the current and potential scale of revenues from the green gas certification market? To what extent can this revenue enable future biomethane deployment, and how could the future framework support this? Please provide evidence to support your response.

11. What is the current and potential scale of revenues from RTFCs? To what extent can these revenues enable future biomethane deployment, and how could the future framework support this? Please provide evidence to support your response.

12. Please provide any evidence on the current or expected costs (capex and opex) and revenues relating to carbon capture on AD plants.

13. What are the most significant barriers to store and transport the CO₂ to sequestration sites? Where possible, please answer with reference for a range of different sizes and

¹ [IGEM launches ground-breaking grid connections research](#)

types of biomethane plants.

14. What is currently preventing the industry from maximising the revenue from selling CO₂, for example to the food and drinks industries? Do you expect opportunities for revenue from this bio-CO₂ market to change over time? If so, how?

15. How can gate fees play a role in underpinning new biomethane capacity and what barriers must be overcome?

16. Please provide further evidence on the potential costs and revenues for production methods discussed in Chapter 1, where you have this information available.

17. How could biomethane emissions be reliably differentiated from fossil fuel emissions following the combustion of gas extracted from the gas grid (which is a mix of biomethane and fossil-derived methane)?

18. How could the UK ETS account for biomethane in the gas grid to make biomethane production more financially sustainable?

19. How might UK ETS recognition of biomethane in the gas grid affect UK ETS markets?

20. Which mechanisms are most likely to ensure we meet our strategic aims in Chapter 2, and why?

21. Which mechanisms are most likely to comply with all the principles listed in Chapter 1, and why?

22. Which mechanisms are most likely to assist with overcoming the barriers to market growth listed above, and why?

Chapter 4: Sustainability

[no response to questions within this section – these are better suited to be answered by biomethane producers]

23. a) What are your views on the criteria set out in Chapter 4 for assessing feedstocks? b) Are there any additional criteria that we should consider?

24. With reference to the feedstock sustainability assessment criteria in Chapter 4 (or any other suggested criteria), please provide any data on AD feedstocks that you think we should consider in future policy.

25. With reference to the feedstock sustainability assessment criteria in Chapter 4 (or any other suggested criteria), please provide any data on feedstocks that are specifically used by non-AD biomethane production methods (outlined in Chapter 1).

26. What are your views on the approaches set out in Chapter 4 for prioritising feedstocks? Are there any alternative approaches that we should consider for future policy?

27. What is the current and potential scale of digestate revenue? To what extent can this revenue enable future biomethane deployment, and how could the future framework support this? Please provide evidence to support your response.

28. What are the barriers, if any, preventing UK AD sites and farmers/landowners from implementing additional ammonia abatement methods, such as the ones identified in

the 2023 WRAP study for DESNZ?

29. How do you consider nutrient balancing in relation to your handling and use of digestate? We particularly welcome views from landowners, farmers, and AD operators.

30. What are the practicalities, costs, and potential environmental impacts associated with transporting digestate to areas with a nutrient-deficit? Please provide evidence to support your response.

31. Can all AD food waste plant operators accept and process food waste with caddy liners or other food packaging included?

32. If liners and food packaging are included, what material types a) are AD plants able to process? b) are preferred? c) are least preferred and why?

33. If liners and food packaging are included, are they typically: a) not stripped (i.e. left to be treated by the AD process)? b) stripped and sent to a separate composting phase on-site? c) stripped and sent to a separate composting facility (off-site)? d) stripped and sent to incineration? e) stripped and sent to landfill? f) other (please describe)

34. Please provide any evidence you have on the benefits and costs of detecting, monitoring or repairing methane leakage from AD sites.

35. What challenges might the biomethane industry face if future government policy sets a limit on fugitive methane emissions from biomethane production?

36. What are the key sustainability considerations for any non-AD biomethane production technologies that could be in scope for the future framework? Please specify which technology your answer relates to.

Chapter 5: Planning and standards

37. Have you experienced or are you aware of any challenges with the planning process for AD plant developments? If yes, please provide details.

IGEM are aware of instances where plants trying to connect to gas distribution networks have experienced significant issues caused by delays in the planning process, or by schemes which create deadlines to achieve specific tariff rates. We join our stakeholders in urging the government to carefully consider these issues as part of future policy design.

38. What type of AD-specific information would be useful to local planning authorities when reviewing planning applications for AD plant development?

No response

39. What are the benefits and risks that would need to be considered in changing the permitting regime to apply the same regulatory standards to AD sites processing waste and non-waste feedstocks?

No response

40. What are your views on the feasibility and usefulness of developing industry-wide guidance on design, maintenance and operation standards for AD plants?

IGEM strongly support the use of industry standards and guidance on the design, maintenance and operation of AD plants. This approach has underpinned the robust, reliable and safe gas network that we rely upon so heavily today and would benefit the biogas production market. IGEM have developed two Technical Standards in relation to biomethane injection into the gas grid and pipelines for biogas distribution:

- IGEM/TD/16 Edition 2 - Biomethane injection
Covering the requirements for design, construction, installation, inspection, testing, operation maintenance and de-commissioning of Grid Entry Units (GEUs).
- IGEM/TD/17 - Steel and polyethylene (PE) pipelines for biogas distribution
Covering the design, construction, testing, operation, maintenance and inspection of steel and PE pipelines for the transport of biogas.

41. What is the impact of grid capacity, now and in the future, on the development, operation and output of biomethane plants? Please outline where this differs between distribution and transmission level and between production technologies.

IGEM are not aware of any future capacity limitations at the transmission level based on predicted future biomethane volumes. It has been highlighted that growth in the direct injection of biomethane into the transmission system, which does not require propanation and can accommodate higher flow rates, requires further assessment.

IGEM are aware of instances of insufficient demand in the distribution network to accommodate the level of embedded injection, and the potential for reverse compression, as referenced within the call for evidence. It has been flagged that this approach will require industry to assess its feasibility, what technical requirements would need to be implemented (such as de-odorisation) and what changes might be needed to arrangements such as the Uniform Network Code, which currently does not stipulate rules pertaining to reverse compression from the distribution network. We are also aware of areas of the UK where existing volumes of biomethane in the network means that there is limited capacity for future connections.

42. Are there any steps the government and the industry could take so that biomethane producers could more easily access reliable grid injection capacity?

The following areas have been highlighted as having potential to help biomethane producers access grid injection capacity more easily:

- Speed up connections through the use of standardisation.
- Simplification of planning processes and sustainability criteria.
- The introduction of green gas connection subsidies.
- A review of the gas regulation's limitations and specifications, to better understand what adjustments or exemptions are appropriate.

There is broad support for a clear position from government on the strategic role of biomethane, in advance of the gas network companies submitting their 2026-2031 business plans to Ofgem. Ensuring that appropriate network investment is made to support biomethane injection will be crucial to the growth and sustainability of the biomethane market – this should be reflected in the regulatory settlements.

43. Which technologies, including reverse compression, could increase grid capacity access for biomethane plants and what are the associated costs and barriers? Please provide evidence for your suggestion, including details on costs where possible.

Gas network companies are leading on a range of projects exploring the technological options for increasing grid capacity. These include reverse compression and other technical upgrades such as injection hubs, modern metering and smart controls. IGEM would be happy to signpost you to relevant project stakeholders for more information.

44. What steps need to be taken by the biomethane industry, gas networks or the government to reduce or remove the need for propane in preparing biomethane for injection to the gas grid while maintaining fair billing for gas customers?

The gas industry and the government need to work closely to instigate a change in the Gas Calculation of Thermal Energy Regulations (GCoTER). Due to the current framework relying on a Calorific Value (CV) model, growth in biomethane injection into the gas grid is associated with higher levels of propane use and therefore carbon emissions. If a new approach to billing customers is introduced that removes the need to propanate the biomethane being injected into the grid, it will enable a greater volume of biomethane to be used, helping to drive demand and grow the market.

As outlined in research led by Cadent on the Future Billing Methodology² work, a number of options have been explored to accommodate the introduction of greener gases in the network. In their final recommendations report, Option A: Work Within Existing Arrangements, is identified as a low risk route to initiate gas network decarbonisation without changing the regulations. Although this provides a pathway to expedite the blending of hydrogen in the network, they acknowledge that there is limited early benefit for biomethane with this option. Option C: Online CV Modelling, detailed how a combination of online and offline modelling can provide one consistent methodology to accelerate the benefits of biomethane and hydrogen blending for heat. It was recommended that a feasibility study into Option C is conducted immediately, in parallel with implementing Option A. IGEM support this approach and would urge government to show support for the delivery of this feasibility study, collaborate with those involved in this work and consider what reforms could help bring a solution closer to delivery.

Given that a new billing methodology will be years away from implementation, there is support for government to take a more active role in what changes can be made to the GCoTER in the meantime and engage with innovation projects, such as the potential of 'green propane' and novel blending tee arrangements. IGEM can signpost you to specific industry projects for more information.

45. What are your views on the best approach to enable optimal plant locations in the future framework? How might this differ across different production technologies?

There is some support for a top-down, strategic approach to coordinating biomethane infrastructure investment, developed in conjunction with industry, to provide more clarity, certainty and efficiency. It has been suggested that 'biomethane zones' could provide a way to coordinate investment across the UK, optimising co-locating opportunities across producers and offtakers – with the National Energy System Operator (NESO), in coordination with government, industry and Regional Energy System Planners, supporting the process.

However, there are also concerns that given the range of uncertainties around technology, feedstocks, the future of the gas network and other considerations, policy that is designed flexibly to accommodate a range of future developments, and supports the existing market led approach, would be more appropriate.

² [Cadent, Future Billing Methodology: Recommendations, March 2022](#)