Department for
Energy Security
& Net Zero

Green Gas Support Scheme Mid-Scheme Review

Government Response

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Introduction

Biomethane is a renewable energy source which can contribute to our net zero goals and increase our country's energy security across a range of sectors through the decarbonisation of heating, power generation, transport, and agriculture. For decarbonising heating in homes, increasing the proportion of biomethane in the gas grid is an established and cost-effective way of reducing carbon emissions. This can contribute to the UK's target to achieve net zero greenhouse gas emissions by 2050. By supporting domestically produced biomethane, we can decrease our reliance on natural gas, and provide diversity in our gas supply to contribute to our energy security. The production of biomethane from anaerobic digestion (AD) also presents an opportunity to create a more circular economy which delivers upstream emissions savings and wider environmental benefits through its role as a waste management technology.

As set out in the Powering Up Britian: Energy Security Plan we are clear that achieving our legally binding net zero targets will require a range of technologies and solutions for decarbonising heat, including biomethane injection to the gas grid. The recently published Biomass Strategy is clear that biomethane will continue to play a role in optimising the path to net zero. The strategy also sets out how sustainable biomass could be best used across the economy to help achieve our net zero greenhouse gas emissions target by 2050, which will inform options for a future framework for biomethane. To support our net zero targets, the strategy recognises the importance of support under the Green Gas Support Scheme (GGSS) to increase biomethane injected into the grid. The GGSS is expected to contribute 4.3 MtCO2e of carbon savings via natural gas displacement over Carbon Budgets 4 and 5, and 10.7MtCO2e of carbon savings over its lifetime.

The GGSS, launched on 30 November 2021, follows on from support for biomethane injection under the Non-Domestic Renewable Heat Incentive which closed to new applicants on 31 March 2021. The GGSS is currently open for four years, however, we recently announced that we will extend the scheme to 31 March 2028, once regulations come into force in Spring 2024, when parliamentary time allows. The GGSS provides tariff-based support for biomethane produced via anaerobic digestion and injected into the gas grid, with producers receiving tariff payments for a 15-year lifetime. The scheme is funded by the Green Gas Levy, which applies to all licensed fossil fuel gas suppliers. It will also help to support high quality jobs, particularly in rural areas, by supporting and growing the biomethane industry.

In March 2023, we launched our consultation on the GGSS Mid-Scheme Review (MSR), which considered the scheme's effectiveness and proposed potential amendments. Proposals included extending the length of the scheme for applications, measures to encourage the use of heat pumps in biomethane production, maintaining the 50% waste feedstock threshold, maintaining scheme eligibility criteria, and we sought views on digestate management and broader sustainability requirements. This government response sets out our final positions following analysis of the responses. We intend to introduce regulations to implement the changes by Spring 2024, when parliamentary time allows.

To recognise the longer-term role of biomethane in optimising the path to net zero, the MSR consultation also provided the first opportunity to comment on the barriers and opportunities facing the biomethane industry, which a post-GGSS biomethane policy framework will seek to address. We intend to test our emerging proposals and gather further evidence for a future policy framework in 2024.

Summary of Consultation Responses

The consultation received 24 responses in total. This consisted of 11 responses from the anaerobic digestion (AD) industry, including trade bodies, whose responses incorporated views from across their membership. We also received 6 responses from the wider renewable energy industry, including some responses from landfill gas and combined heat and power (CHP) operators. The remaining responses included a mixture of academics, consultants, and other organisations.

Several of the proposals outlined in the consultation received broad support; for those proposals where there was less support, we often did not receive sufficient evidence to support a change in approach. A summary of the overall responses can be found below:

- Most respondents agreed with our proposal to extend the GGSS by 4 months, although most felt that an extension of 1 to 2 years would be more beneficial.
- Our proposal was that we should not extend tariff guarantee deadlines. Many respondents did not agree with this. Few respondents felt that a tariff guarantee extension was unnecessary.
- Our proposal was that we should not extend commissioning window deadlines for prospective applicants. Whilst some respondents did agree with the proposal, many did not.
- There was a mixed response to proposals to maintain the current waste feedstock threshold under the GGSS.
- Most respondents agreed with proposals not to introduce additional requirements for the management of digestate under the GGSS.
- Some respondents agreed with the proposal not to amend the GGSS eligibility criteria to allow CHP conversions to biomethane injection under the scheme.
- Overall, respondents agreed with proposals to amend calculations for eligible biomethane to exempt heat supplied by a heat pump and agreed with the recommended calculation approach.
- We also gathered views on monitoring and mitigation practices in the industry to prevent methane emissions and received some examples of good practice from AD operators.
- Additionally, we received a range of responses on the barriers and opportunities facing the biomethane industry, which a post-GGSS policy framework will seek to address.

Executive Summary of the Government Response

This government response provides a summary of the response to each proposal and sets out the final policy position for each. This follows careful consideration of the responses to the consultation and the evidence received.

We will be making the following changes:

- As signalled in our announcement on 21 October 2023, we intend to extend the GGSS to 31 March 2028 to provide more time for prospective applicants to register on the scheme. This extension also ensures continued alignment between the GGSS and the introduction of municipal food waste collections across England, as set out in Defra's Simpler Recycling Government Response.

- We will make amendments to encourage the use of heat pumps in the production of biomethane and we set out key eligibility requirements for scheme participants installing heat pumps in this government response.

We will maintain the current regulations for the following areas:

- We will not extend tariff guarantee and commissioning window deadlines, given the overall extension to the scheme.

- We set out decisions to maintain the current waste feedstock threshold following mixed responses from respondents on the need to amend this and the expected increase in waste feedstock availability from the introduction of Defra policies.

- We will maintain requirements for managing digestate as respondents broadly agreed with this proposal and the lack of evidence to inform further requirements.

- We outline our decision to maintain the current eligibility criteria for the GGSS and not allow CHP conversions as we did not receive compelling evidence to demonstrate this could deliver value for money.

Next steps:

- We have outlined a commitment to taking steps across government to develop a shared understanding of monitoring and mitigation practices to reduce methane emissions in the production of biomethane.

- We also set out plans to test our emerging proposals and gather further evidence for a future policy framework in 2024 following the initial consultation responses.

- We intend to make the necessary regulatory changes from this Mid-Scheme Review in Spring 2024.

Green Gas Support Scheme Mid-Scheme Review Government Response

GGSS deadline extension

Q1. Do you agree that extending the GGSS closure date would be beneficial? Yes/No. We would welcome views on a four-month extension (to 31 March 2026).

Consultation proposal

In the consultation we proposed extending the GGSS deadline for applications by four months to 31 March 2026, noting that challenges securing waste feedstocks were likely to be having an impact on the number of plants coming forward under the scheme.

It was previously expected there would be an increase in waste feedstock availability following requirements under the Environment Act 2021. The 2021 Simpler Recycling (previously known as Recycling Consistency) consultation published by Defra initially proposed requirements for all businesses and households to receive separate food waste collection phased between 2023/24 - 2030/31. However, market disruptions and supply chain challenges for local authorities have led to unavoidable delays for the implementation of food waste collections services and infrastructure.

This has resulted in reduced feedstock availability for AD plants, and we are aware that accessing quality waste feedstock at an affordable gate fee is a common challenge for developers. We outlined how this could lead to forecasted GGSS deployment levels not being met as plants may struggle to meet the 50% waste feedstock threshold and decide not to apply for the GGSS.

Therefore, we proposed a four-month extension which would allow more time for food waste focused AD plants to secure feedstocks to ensure that original deployment estimates of the GGSS can be met.

Summary of responses

We received 19 responses to this question. Among these, the majority were in favour of the extension proposal. Some respondents disagreed with the proposal, on the basis that it was insufficient or because of the impact an extension could have on a successor scheme.

Most respondents suggested that a four-month extension would not be long enough to manage the concerns raised. It was suggested that an extension length of between 12 and 28 months would be necessary to support plant deployment on the scheme, given current development timelines.

Among those who favoured an extension, several cited the challenges securing food waste collections and most mentioned supply chain delays or other delays to plant development, with many respondents referencing both as key blockers.

In addition to an overall scheme extension, a few of the responses also advocated flexible commissioning deadlines, similar to those granted under the Renewable Heat Incentive, to ease pressures in meeting commissioning deadlines where plants are facing supply chain delays.

Across all responses, a few also mentioned the importance of avoiding a hiatus between the closure of the GGSS and any future framework being introduced to ensure continued support for biomethane production.

Government response

It is clear from the responses to this question that the proposed extension to 31 March 2026 would be insufficient. As previously announced, we intend to extend the Green Gas Support Scheme to 31 March 2028, providing an additional two years and four months for prospective applicants to fully register on the scheme.

We expect that this extension will provide confidence for potential applicants that they will have sufficient time to commission the plant and fully register on the scheme before it closes. This will help ensure that original scheme deployment estimates are met, maintaining industry growth, and making it more cost effective to meet our net zero targets. The extension will also apply to applications for additional capacity, which may be made where the injection of additional biomethane is expected to commence no later than 31 March 2028.

We recognise that securing food waste feedstock has been a key challenge for developers looking to apply to the scheme. By extending the GGSS to 31 March 2028, the scheme will align better with deadlines for local authorities to implement food waste collections across England, as set out in Defra's Simpler Recycling Government Response, which will increase the availability of waste feedstocks.

Tariff lifetimes will remain at 15-years, meaning that tariff payments for eligible biomethane and associated Green Gas Levy collections may continue being made until 2043/44. However, the extension itself will not automatically increase the cost of the scheme; budgeting decisions for the additional scheme years will follow the standard budget management procedure for the GGSS.

While we acknowledge some respondents' calls for flexible commissioning deadlines, we will not introduce this. We believe that the scheme extension, which provides an additional two years and four months of commissioning time, should be sufficient to mitigate supply chain delays and other pressures on commissioning.

We recognise the importance of avoiding a hiatus for the AD sector between the GGSS and any post-GGSS framework. By extending the scheme to 31 March 2028, we expect to significantly reduce the risk of this happening.

While this government response formally confirms our position, the extension will not come into effect until the MSR regulations become law. We intend to introduce these regulations in Spring 2024, when parliamentary time allows. In the meantime, scheme duration will remain as is and therefore only scheme applicants who plan to commission within the current scheme deadlines may apply until any new regulations come into effect. Applicants should be aware that there will be no extensions to tariff guarantees or commissioning window deadlines for applications submitted before the extension comes into effect; applications made now should be set with achievable commissioning dates within the current scheme window.

Supply chain issues and tariff guarantee extensions

Q2. Do you agree with the recommendation to maintain the current tariff guarantee deadline? Yes/No. Please explain your reasoning and include any evidence you think is relevant.

Consultation proposal

Under the GGSS, if a tariff guarantee is issued, the applicant will have a defined period in which to fully commission their installation and register on the scheme. The tariff guarantee will be valid until the date on which the applicant stated they expect the injection of biomethane to commence in their Stage 1 application, plus a 182-day grace period. After this grace period has expired, the tariff guarantee will be revoked, and the participant would need to reapply to the scheme.

While we recognised the challenges for industry due to the supply chain delays and development timelines, we were clear in the consultation that we had not seen evidence to determine the appropriate length of any tariff guarantee extension. The length of an extension would need to be useful for applicants, whilst ensuring the tariff guarantee deadlines and commissioning dates continued to operate as effective budget control mechanisms.

We therefore proposed not to extend the six-month tariff guarantee deadline, to ensure the budget control mechanisms were still robust and to help ensure the scheme continues to deliver value for money.

Summary of responses

We received 13 responses to this proposal, most respondents disagreed with the proposal to maintain the current tariff guarantee deadline. Many respondents referenced food waste availability and supply chain delays as their rationale for requiring an extension, although

limited evidence was provided by respondents on these issues. Those opposing the proposal did not suggest an appropriate extension length for tariff guarantees but were in favour of a 'flexible' tariff guarantee extension, particularly where certain development milestones have been achieved.

Feedback from some respondents suggested that while these challenges are present, they can be managed effectively within existing tariff guarantee deadlines. It was also noted by few respondents within this group that a tariff guarantee extension would not be necessary should an overall scheme extension be granted.

A few responses also recognised that the scheme application process does not enable an existing application to be amended to revise a tariff guarantee deadline. Applicants must instead withdraw and re-submit their application which can result in duplicated administration efforts.

Please see page 11 for the Government Response to Question 2 and Question 3

Supply chain issues and commissioning deadline extension

Q3. Can supply chain issues be adequately managed within the current commissioning window? Yes/No. Please provide evidence on the impact of supply chain delays on AD plant development and how they can be addressed.

Consultation proposal

We outlined how supply chain issues and development challenges may affect potential applicants from applying towards the end of the scheme commissioning window. Industry feedback suggested that investors were concerned with the time available to prepare applications to allow AD plants to commission before the scheme closure deadline in November 2025. This was due to plant development timelines in some cases reportedly exceeding 24 months.

In the consultation, we expressed that initial feedback from industry prior to the consultation showed an interest in a similar flexible commissioning deadline extension to what was previously seen under the Non-Domestic Renewable Heat Incentive (NDRHI). If implemented under the GGSS, this would see applicants submitting Stage 2 information prior to scheme closure but with the ability to set a commissioning date after that deadline. The tariff length for this plant once commissioned would be a 15-year tariff, minus the length of time it took them to commission after the scheme closed.

In the consultation, we proposed not to grant an extension to commissioning deadlines, due to a lack of sufficient evidence on the usefulness of such an extension. We recognised that while there are difficulties in long-term planning faced by potential GGSS

applicants, it would be more appropriate to continue engaging with industry to monitor supply chain issues.

Summary of responses

The majority of respondents disagreed with the proposals. Across responses, supply chain delays and feedstock supplies were again the most commonly cited factors creating uncertainty and heightened risk for commissioning under the GGSS.

Respondents that did not feel supply chain issues could be managed within current scheme commissioning deadlines were not specific about the extension length needed which could help manage these issues. However, some respondents were in favour of adopting a flexible extension approach to the commissioning deadline like the NDRHI. It was suggested that this could support plant deployment by giving greater certainty that plants could commission and fully register in time to receive tariff payments.

Government response to Questions 2 and 3

We recognise the challenges being faced by the AD industry around supply chain issues and impacts on plant development timelines. We expect the new scheme closure date of 31 March 2028 will provide sufficient time to support prospective applicants looking to commission before the scheme closes. As a result, we do not propose to make any further changes to tariff guarantee or commissioning deadlines, including for tariff guarantees that have already been issued.

AD developers should continue to monitor possible supply chains issues, taking all viable steps to mitigate the impacts of potential delays; prospective applicants should seek to manage supply chain issues within the new scheme window once regulations come into effect. We expect applicants to be realistic and timely in their nominated date as they will not be eligible for payment until they have commissioned and submitted a properly made Stage 3 application to become fully registered on the scheme, which must be before scheme closure. If applicants fail to commission by their nominated commissioning date or within the 182-day grace period, their tariff guarantee will expire, and they must re-apply to the scheme. We will continue to work closely with industry to monitor supply chain issues, support developers, and ensure continued deployment on the scheme.

Furthermore, we are aware that uncertainty around the accessibility of food waste has been a key factor in causing delays for prospective scheme applicants. Defra's Simpler Recycling Government Response set out clear timelines for the introduction of municipal food waste collections across England, which fall within the extended GGSS commissioning deadlines. We expect this will support the availability of waste feedstocks for AD plants to deploy within the GGSS scheme window.

Tariff guarantees that have already been issued will retain their original deadlines, even where these align with the original scheme closure, as we expect applicants to have planned accordingly to meet those timelines when applying. Should applicants wish to

change their expected commissioning date or the end of their commissioning window, they will be required to withdraw their current application and submit a new application for a tariff guarantee.

Waste feedstock threshold

Q4. Do you agree that the minimum waste threshold should be maintained at 50% of all biomethane (by energy content)? Yes/No. Please provide evidence to support your response.

Consultation proposal

In the consultation, we noted the importance of waste and residue feedstocks in offering significant carbon savings compared to other feedstocks, and the circular economy benefits from co-products such as digestate.

The GGSS sustainability requirements for AD plants state that 50% of all biomethane (by energy content) must be produced using waste or residue feedstocks. In the Future Support for Low Carbon Heat Government Response, we committed to reviewing the waste feedstock threshold, with a view that it may be raised given wider government policies coming into effect. However, market disruptions and supply chain challenges for local authorities has led to unavoidable delays for the implementation of food waste collections services and infrastructure. As a result, we noted that we expected decreased availability of waste feedstock during the current GGSS application window.

Given the continued uncertainty over availability of waste feedstocks and the potential negative impacts on deployment from raising the waste feedstock threshold, we proposed to maintain the current waste feedstock threshold at 50%.

Summary of responses

We received 18 responses to this question. Most respondents agreed with the proposal to maintain the current waste feedstock threshold stating the benefits of waste feedstocks in overall carbon savings.

Some respondents disagreed with the proposal; however, no respondents were in favour of a higher threshold. Several respondents expressed a preference for lowering or removing the threshold altogether. It was commonly referenced that the availability of waste feedstocks was increasingly challenging for operators, with them having to accept contaminated food waste at times.

Some respondents who favoured removing the threshold altogether claimed that the scheme's other sustainability requirements, such as the Greenhouse Gas (GHG) criteria,[1] act as an effective tool to maximise carbon savings under the scheme and therefore incentivise the use of waste feedstocks, making a threshold unnecessary.

Government response

We recognise that securing waste feedstocks has been an ongoing challenge for developers and we are continuing to monitor the availability of waste feedstocks to ensure impacts on the AD industry are managed effectively. Based on the responses provided, we believe that scheme applicants should still be able to meet the 50% waste feedstock threshold and we will therefore maintain the current feedstock threshold.

With the recent publication of Defra's Simpler Recycling Government Response, which set out details for the implementation of mandatory municipal food waste collections across England, we expect that food waste volumes will increase over the lifetime of the GGSS. It is the government's intention that AD will play a key role in managing this increased food waste; as set out in the food waste hierarchy, AD represents the best environmental outcome for the treatment of unavoidable food waste. We expect all GGSS participants to ensure that the food waste hierarchy is being followed when procuring feedstocks. Under the GGSS the waste feedstock threshold is designed to maximise carbon savings under the scheme and support the deployment of waste focussed AD plants.

While we previously expected an increase in waste feedstocks at the scheme mid-point to support raising the threshold, the responses from industry indicate that this is not currently feasible. The increase in waste feedstock availability over time could support participants utilising more than 50% wastes in the production of biomethane, however, mandating a higher threshold before food waste collections are fully in place across England could limit deployment under the scheme. This is particularly true for AD developments in rural areas who operate closer to the 50% threshold, and for AD plants in Scotland and Wales which may not directly benefit from the increase in food waste feedstocks. We will continue to review the availability of waste feedstocks for any potential impacts on deployment.

The responses we have received have provided valuable information on feedstock use across the sector. This will help inform the development of a future framework for biomethane which encourages sustainable feedstocks.

[1] Under the GGSS, the lifecycle GHG emissions associated with the biomethane must be less than or equal to 24g CO_2 (eq.) per megajoule of biomethane injected.

Digestate

Q5. Do you agree with the proposal to maintain digestate mitigation regulations under the GGSS? Yes/No. Please provide evidence to support your response.

Consultation proposal

The consultation highlighted the importance of appropriately managing digestate (a co-product from the AD process). This is to ensure negative environmental impacts including ammonia emissions and effects on wider ecosystems are reduced.

We previously committed to reviewing available ammonia reduction technologies through a technoeconomic study that could be used to inform additional requirements for GGSS participants. The WRAP study[2], which was published alongside the consultation, found that gas storage covers for digestate were the optimal technology for reducing ammonia emissions, whilst being cost effective for operators. Under Environment Agency (EA) permitting requirements, which are applicable to all GGSS participants based in England and Wales as waste feedstock plants, these gas storage covers are already required on site. In Scotland, the Scottish Environment Protection Agency have also introduced their own strict requirements to minimise the environmental impacts of digestate, including on plastic contamination. While other technologies showed benefits in reducing ammonia emissions, the cost impacts on producers could not be measured with certainty.

The proposal outlined our intention to maintain digestate mitigation technologies based on the findings of the study. We also referenced proposals that were outlined in Defra's Environmental Improvement Plan, and the EA review of digestate Quality Protocols. These are likely to lead to a tightening of requirements to help ensure more effective management of digestate and ammonia emissions.

Summary of responses

There were 13 responses to this question, most respondents agreed with the proposal to maintain digestate mitigation regulations under the GGSS. Respondents recognised the importance of managing environmental impacts from digestate but were in favour of broader efforts across government to address this issue more effectively.

Some respondents disagreed with the proposals and suggested the current GGSS requirements should allow for a broader range of technologies to be accepted as sufficient in mitigating ammonia emissions, as a substitute for gas covers. Some respondents recommended a case-by-case approach from Ofgem to determine whether operators were effectively mitigating impacts from digestate. One technology referenced was ammonia

[2] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1145312/identifying-impacts-from-food-and-farm-digestates.pdf

stripping at the pre-storage stage, which some respondents felt may be more effective at reducing ammonia emissions.

Government response

As the biomethane market continues to grow, it is important we continue to effectively manage the environmental impacts from digestate. The consultation responses demonstrated a commitment from industry to continue addressing these and the innovations in the market to support this. Given the responses did not highlight a consensus on other technologies to be considered following the findings of the WRAP study, we will maintain our position to not introduce new requirements under the GGSS for mitigating the impacts of digestate. Producers should continue to adhere to the Environment Agency's requirements to cover digestate stores and may use any EA approved best available technologies (BAT) compliant technologies.

We recognise industry responses on the need for a broader range of technologies being assessed on a case-by-case basis under the GGSS. This, however, would be challenging to administer in way that would ensure consistent standards across the technologies presented, given the evidence currently available. Therefore, we are not introducing any further requirements to the management of digestate under the GGSS. We expect scheme participants to continue operating in line with current requirements and would encourage operators to take additional steps to further mitigate impacts from digestate where possible.

Across government, there is a broader effort to improve the practices around digestate management and to mitigate its environmental impacts. Earlier this year, Defra published their Environmental Improvement Plan where they committed to consult on new rules to reduce ammonia emissions from the management of organic manures, including requirements to use low emissions spreaders for slurry and digestate, and to cover slurry and digestate stores. In addition to this, the Environment Agency is in the process of reviewing the Quality Protocol for digestate which will consider practices for appropriately managing digestate. We would encourage industry to engage with Defra and the EA to share their evidence and views, as proposals are developed, to ensure future requirements introduced are consistent with the continued growth of the AD market.

CHP conversions

Q6. Do you agree with the recommendation not to expand the GGSS eligibility criteria to allow CHP conversions to biomethane injection under the scheme? Yes/No. If not, please provide evidence on capital costs, operating costs, and post-tax nominal rates of return of CHP plants, biomethane plants, and conversions.

Consultation proposal

In the consultation, we reviewed the costs and benefits associated with AD Combined Heat and Power (CHP) conversions as part of the GGSS MSR to consider whether the eligibility criteria of the scheme should be amended. Currently, AD CHP plants seeking to convert to biomethane-to-grid plants are ineligible for support under the GGSS, as the regulations state that all equipment used to produce biomethane must not previously have been used to produce biogas or biomethane. This is because tariffs available through the GGSS are calculated to compensate the cost of new AD plants and associated equipment and infrastructure to incentivise their deployment.

We set out our analysis of the environmental, capital, and operational costs and benefits associated with CHP conversions across two scenarios. The first scenario related to supporting 'early conversions', where plants would convert before the GGSS closure date and hence before the end of their existing subsidies. The second scenario related to supporting 'end of subsidy conversions', where plants would convert once their renewable electricity subsidies ended.

The analysis suggested that 'early' CHP conversions to biomethane before the GGSS closure date would not represent positive social net present value (SNPV) under the counterfactual scenario that the CHP site would continue running after their electricity subsidy ran out rather than continue running. This means it could not be considered a value for money intervention. The consultation also highlighted the mismatch in timings between the end of the renewable electricity subsidies and the GGSS scheme closure. As existing subsidies are due to end between 2027 and 2038, supporting CHP conversions under this scenario would require a long-term extension to the GGSS application and commissioning deadlines, which was not deemed feasible. The operational risk of allowing 'early conversions' within the current GGSS timelines was also highlighted, including complexity managing tariffs, budgets, and Green Gas Levy rates, as well as the risk of double subsidy. Consequently, we proposed not to expand the GGSS eligibility criteria to allow CHP conversions to biomethane injection under the scheme.

Summary of responses

There were 18 responses to this question. Most of the respondents disagreed with the proposal that the GGSS should not be amended to support CHP conversion. Some respondents supported the proposals, agreeing that amending scheme eligibility criteria would

not demonstrate value for money. Those who agreed also noted that the resources required to develop suitable tariffs and criteria for CHPs under the scheme would detract from efforts to develop a future biomethane policy framework that could support CHPs more effectively.

Those respondents who disagreed referenced a need for alternative subsidies to replace the funding that CHP plants receive from renewable electricity subsidies once they begin to taper off from 2027. Respondents also referenced the likelihood for the increased need to prioritise biomethane production in 2030 to support the decarbonisation of the gas grid compared to supporting renewable electricity. However, respondents provided little evidence for what would happen to CHP sites, in the absence of subsidy, to supplement our analysis as to whether plants would decommission or continue running.

Some respondents also expressed an interest in amending the scheme to support the expansion of non-GGSS sites. This would see existing AD plants, that may be RHI funded, expanding their site capacity with the additional production being eligible for GGSS tariffs. This could also include existing CHP sites adding additional biomethane injection capacity to their site. It was argued that these expansions could secure additional deployment for the scheme at a faster rate due to shorter development timelines, ease in securing planning permissions, and lower costs compared to building a new site. This is explored in more detail below.

Please see page 18 for the Government Response to Question 6 and Question 7

Q7. How could post-GGSS biomethane policy best support CHP conversions to biomethane?

Consultation proposal

In the consultation, it was noted that the rationale for supporting CHP conversions through a post-GGSS policy framework may be stronger due to more appropriate timings and the greater value placed on carbon savings as we approach the target of net zero emissions in 2050. It was emphasised that our analysis was sensitive to the uncertainties over whether CHP plants would continue operating without renewable electricity subsidies. We therefore proposed considering CHP conversions to biomethane within the development of a post-GGSS future biomethane policy framework and invited views on how future biomethane policy could best support CHP conversions.

Summary of responses

There were 25 responses to this question. Most responses were in favour of supporting CHP conversions – as well as AD plant expansions - through any post-GGSS biomethane framework, particularly if they remain ineligible under the GGSS. However, responses were mixed in terms of the way that future policy could achieve this.

A few respondents suggested the need for a tariff-based system for biomethane injection like the GGSS, however, respondents noted that many CHP sites are unlikely to be located near

injection points so this may not be viable. A similar number of respondents advocated a shift in support to methods that recognised carbon savings from biogas and biomethane production, regardless of the technology used.

A few responses also pointed to the need for any future intervention to be flexible enough to take the different combinations of previous subsidies into account appropriately, in a way that did not over-compensate some plants or under-support others.

In response to this question, a few respondents reiterated their view that support should be introduced under the GGSS, as doing so under a future framework would be too late.

Government response to Questions 6 and 7

CHP Conversions

We acknowledge the responses advocating that the GGSS should be amended to support the conversion of AD CHPs to biomethane-to-grid, especially as renewable electricity subsidies start to expire from 2027 onwards. However, we did not receive sufficient evidence through our consultation to change the SNPV analysis, particularly in relation to which counterfactual (i.e., whether shutting down or continuing running) is more likely when CHP sites' electrical subsidies cease. Post-consultation engagement highlighted that both counterfactuals were considered as equally likely outcomes by industry. While the extension of the GGSS to 2028 may have supported some CHP sites if we were to amend the eligibility criteria, our SNPV analysis accounting for the extended scheme years still did not demonstrate a case for supporting conversions as sensitivities remained over whether CHP sites would continue running or close-down.

Furthermore, we did not receive enough compelling evidence that the operational, budgeting, and double subsidy risks previously outlined in the consultation could be appropriately managed. As such, we are maintaining our position that it would not be appropriate to amend the GGSS to support CHP conversions.

We recognise the importance of avoiding the risk of stranded assets in the AD CHP sector, where possible. As such, we will be considering the role of AD CHPs as part of any future biomethane policy framework and plan to engage with industry in 2024 in more detail about how this may be achieved.

Non GGSS Expansions

We have also considered the request from some stakeholders to amend the scheme to support the expansion of non-GGSS AD plants. We recognise that this could deliver biomethane production quicker and potentially at a lower cost than new AD plants. As with CHP conversions, however, there are a number of non-monetised considerations which make this unfeasible. It would require significant redevelopment of the GGSS regulations, particularly in regard to the eligibility criteria. A core tenet of the scheme is that, in order to be eligible for the GGSS, 'equipment used to produce biomethane' must not have been previously used to produce biomethane or biogas. This would not be

compatible with the inclusion of expansion sites; revising this would require a fundamental reworking of many other elements of the scheme that are built on these criteria. In addition to eligibility criteria, supporting expansions would also require a new set of tariffs based on a wide variety of cost profiles. Developing regulations with suitable eligibility criteria and new tariffs would require significant evidence gathering and policy development that may not be feasible to implement in time for the potential benefits to be realised.

We would also be required to manage differing sustainability requirements across support schemes, especially given that AD plants with connections to the gas grid that are looking to expand are likely to be NDRHI plants. Similarly, ensuring the proportions of biomethane are correctly attributed to the appropriate scheme would present administrative challenges. With the differing reporting periods across the schemes, there would be significant administrative and legal complexities in ensuring that these standards are met, with further controls needed to appropriately manage any associated fraud and gaming risks.

For these reasons, we also do not intend to amend the GGSS to support the expansion of non-GGSS sites. As with CHP conversions, we acknowledge the benefit in supporting the expansion of existing infrastructure if this can be delivered appropriately and we will take this into consideration for any post-GGSS biomethane policy framework.

Heat pump exemptions for heat deduction calculations

Q8. Do you agree that heat from heat pumps should be exempt from heat deductions for eligible biomethane? Yes/No.

Q9. Are there additional non fossil fuel technologies or approaches that warrant consideration? Yes/No. Please provide evidence to support your response with particular attention to costing information and environmental impacts.

Q10. Do you agree with the approach of using energy input to calculate the deduction? Yes/No. We would welcome comments on the administration required. Please provide evidence to support your response.

Consultation proposal

We invited views on several questions relating to the heat pump exemption (Questions 8, 9, and 10). The responses to these are summarised together below.

We consulted on proposals to exempt heat supplied by a heat pump from heat deductions in the calculation for eligible biomethane. Currently, the regulations state that all heat must be deducted from the total amount of ‘eligible biomethane’ which receives tariffs. The only exceptions are for heat contained in feedstock or from the combustion of biogas. This would encourage the use of heat pumps as a non-fossil fuel source of heat,

in the production of biomethane. AD plants using eligible heat pumps would see a greater proportion of their biomethane becoming eligible for tariff payments compared to those using fossil fuel heating.

In early engagement, industry showed interest in low carbon technologies being included under the same exemption as the heat pumps, such as waste heat recovery systems. In the consultation we proposed that only heat pumps would be eligible, as there was limited information on costs and environmental impacts available for other technologies to inform a position. In order to effectively consider these technologies, we invited views and requested further evidence from industry to close these evidence gaps.

To appropriately compensate the use of heat pumps in the final eligible biomethane payment, it was proposed that a deduction from eligible biomethane would instead be made for the electricity input to the heat pump. This is to ensure heat pumps would be appropriately compensated under the GGSS, where budget is primarily targeted at anaerobic digestion deployment and that only the low carbon proportion of heat by the heat pump would be rewarded.

Summary of responses

In response to Question 8, most respondents agreed with the proposal, recognising the additional carbon savings that the use of heat pumps can provide. A few respondents disagreed with the proposal, noting that the process may be too complex and raised concerns over minimum efficiency requirements.

In response to Question 9, a few respondents referenced alternative technologies, which included waste heat recovery, solar fired boilers, and electric boilers supplied with renewable electricity, although there was no consensus on any single technology. No evidence was supplied by respondents on the costing or environmental impacts of these technologies. Some respondents recommended that any further technologies be assessed on a case-by-case basis throughout the duration of the scheme as to whether they could be included in the exemption.

A few respondents also raised an interest in exempting the electricity supplied to the heat pump, if included in the exemption, where participants can demonstrate the electricity is 100% renewable. Examples of this included heat pumps which are connected to a solar PV energy supply.

We received 14 responses to Question 10, with the majority of respondents agreeing that electricity metering of the heat pump should be used to allow the electrical input to be deducted from eligible biomethane. Some respondents suggested that the calculation method for deducting electricity also served as an effective mechanism to incentivise the use of efficient heat pumps. It was suggested that this approach would avoid the need to implement additional eligibility criteria to encourage heat pump efficiency, such as requiring a minimum Seasonal Coefficient of Performance (SCOP) or Coefficient of Performance (COP).

Government response to Questions 8, 9 and 10

We will proceed with the proposed changes to end deductions from eligible biomethane calculations for heat supplied by heat pumps. Once regulations are introduced, this will reward the use of eligible heat pumps in the production of biomethane, in line with the existing biogas exemption, encouraging producers to move away from fossil fuel heating sources.

To appropriately reward the use of heat pumps and ensure heat pumps operate efficiently, the electrical input to the heat pump will instead be deducted from eligible biomethane. As a result, scheme participants using heat pumps may see a greater proportion of biomethane becoming eligible for tariff payments.

All electricity input will be deducted, whether the heat is used for producing biomethane or for other on-site purposes, including cooling. This is intended to incentivise heat pumps which operate more efficiently and will manage gaming risks under the scheme. Given this, participants' heat pumps will not be required to meet a minimum SCOP level to be eligible for this exemption.

Heat pump eligibility

Air source heat pumps, ground source heat pumps and water source heat pumps will be the only technologies eligible for this exemption. Hybrid heat pumps, where the heat pump may be combined with an oil or gas boiler, and gas-powered heat pumps will not be eligible. This is to ensure that only low carbon heat pumps are reflected in final eligible biomethane tariff payments. Heat pumps will also be required to be new equipment and newly installed; the heat pump should not have been commissioned prior to 31 March 2023 to ensure it has not been funded by the NDRHI. We will also require that its purchase or installation must not be or have ever been supported by public funds to manage overcompensation risk.

In line with the existing biogas exemption for heat deductions, notifications to Ofgem for a change of heat source to an eligible heat pump can be made throughout a producer's tariff lifetime once the regulations come into effect. We expect this to have a small impact on overall scheme budget as an increased amount of eligible biomethane would be compensated as a result of scheme participants adopting heat pumps. We will ensure that any budgetary impacts are kept proportional through existing budgetary control mechanisms, which will ensure that the majority of scheme budget continues to support the deployment of new AD plants.

Until regulations come into force, heat supplied by a heat pump will continue to be deducted from eligible biomethane. Heat pumps will only be reflected in calculations once Ofgem have reviewed the evidence and are satisfied all eligibility criteria have been met. For participants who add a heat pump to their site following registration on to the scheme, their heat pump eligibility will be checked as part of the review process following a notification of a change. To manage the administration of these changes and minimise

budget impacts, the heat pump exemption will not apply retrospectively for any period prior to the notification of a change to Ofgem, or prior to regulations coming into force.

Additional technologies

While additional technologies were suggested by some respondents to be considered for the exemption, we received limited evidence on their costing information and environmental impacts that could inform a policy position. Therefore, we will not be exempting any other heating technologies from the heat deductions. Additionally, while we recognise the additional benefits of a heat pump being supplied by renewable electricity, all electricity input to the heat pump will be deducted. Given the range in renewable electricity sources that might be used in this context, exempting renewable electricity input would lead to administrative and delivery complexities beyond the remit of a scheme primarily designed to support new AD deployment.

Sustainability practices

Q11. How effective are current methane leakage prevention, monitoring, and mitigation practices? Please provide evidence to support your response, including examples of good practice.

Consultation proposal

The government is committed to promoting the sustainable production of biomethane to contribute towards decarbonising energy and processing waste in a carbon efficient manner. In our consultation, we detailed how the department is undertaking studies into the greenhouse gas emission savings of AD and biomethane production to further our understanding of the emissions savings associated with biomethane production and any environmental impacts.

This included a study on methane leakage, carried out by the National Physical Laboratory (NPL), the results of which will be published in due course. The overall aim of the project is to measure the methane emissions from the AD and biomethane production processes and understand the potential sources of methane emissions in an AD site. This is particularly important as, to maximise the sustainability of biogas and biomethane production, we need to understand the levels of methane leakage across the industry with greater certainty and methods to manage these emissions.

In parallel to these studies, we sought evidence from the industry on current and potential methane leakage prevention, monitoring, and mitigation practices. This will inform cross-departmental work, including with Defra, DfT, and the Environment Agency, to incentivise sustainable practices to maximise the environmental benefits of AD and biomethane.

Summary of responses

We received 14 responses to this question, with respondents all emphasising the importance of managing methane emissions from an environmental and commercial perspective. The most commonly referenced techniques included annual surveys and annual monitoring activities on site. Several respondents referenced monitoring technologies, including the use of hydrocarbon infrared cameras to identify point source emissions, measuring for leaks at the double membrane hoods, and continual monitoring of the lower explosive limit (LEL) between membrane hoods, which can identify leakage areas. In addition to measuring techniques, some low-cost alternative methods were suggested, such as using soapy water over hoods and covers, where bubbles may indicate a leak.

Some respondents also referenced the importance of effectively maintaining and monitoring plant equipment, particularly pressure relief valves (PRV). PRVs were cited as one of the key sources for methane emissions that can be addressed through manufacturing design, maintenance, and regular monitoring. In addition, methane slippage at the biogas upgrading stage was cited as another source of emissions that should be regularly monitored and the equipment maintained appropriately in order to minimise emissions. Several respondents suggested that higher methane emission levels may be due to inadequate manufacturing standards of equipment, particularly at the biomethane upgrading stage. Respondents suggested this could be addressed in part by guarantees from equipment suppliers on the potential methane slip levels that could occur with specific equipment to help inform developers' decision-making on equipment to purchase.

While some AD operators stated that their techniques were effective, they emphasised that some methane leakage may always happen due to the nature of biomethane production. Most respondents recognised the importance of managing methane emissions and expressed a willingness to do so. Some respondents mentioned the GGSS may not be the most appropriate mechanism for imposing further requirements to manage methane emissions, as wider regulations may be more effective at improving industry practices more widely.

Government response

As mentioned in the consultation, managing methane emissions is crucial to ensure biomethane is produced sustainably and to minimise the environmental impacts of its production. The responses from industry highlight their commitment to continued action to minimise methane emissions as much as possible by using the range of readily available practices and technologies to achieve this, in addition to proper use and maintenance of equipment including PRVs as mentioned by respondents.

We expect AD operators and GGSS participants to operate in line with their permitting requirements and take active steps to identify and tackle methane emissions on site. The responses show a range of approaches which allow operators to address methane leakage and emissions before excessive levels are reached. Operators that fail to comply with permitting requirements and do not take appropriate action to address excessive methane emissions risk having their permit revoked by the EA, and as a consequence

payments under the GGSS will be withheld. Although we recognise some level of emissions may always occur, reducing these should be a priority to ensure the sustainability and the commercial viability of a site. We would implore industry to continue exploring innovations in technologies and practices that may allow emissions to fall even further and will continue to explore this while developing a future biomethane framework.

Across responses, a range of methods and technologies were highlighted which are available to tackle methane emissions. While we are not introducing additional requirements under the GGSS, we will continue working with the EA and industry to develop a greater understanding of methane emissions in the sector and how these can be reduced to further improve the sustainability of biomethane. The EA has developed and is looking to publish a methane action plan which sets out their approach to tackling methane emissions across the sectors they regulate, including waste feedstock AD plants such as those under the GGSS. We would encourage the biomethane industry to engage with the EA as this work develops to ensure that industry and government take the right steps to effectively reduce methane emissions as much as possible.

Future policy framework for biomethane production

Q12. What are your views on how we can best address the areas listed above as part of our future policy design?

Consultation proposal

The consultation sought initial views on a future policy framework for biomethane to follow the GGSS. We asked for responses on how to best address a number of key areas, including appropriate incentive mechanisms, the technical potential for biomethane, long-term challenges securing feedstocks, the commercial viability of biomethane production, and maximising revenue streams.

Summary of responses

There were 21 responses to this question. Most respondents cited areas they felt should be key considerations in any future framework, including barriers to be addressed, and ways to maximising revenue streams. The most common theme was the need for a support mechanism to follow the GGSS. While there was no consensus on the most appropriate mechanism to support the biomethane market, a few respondents expressed a preference for a supplier obligation mechanism linked to carbon intensity, while slightly more expressed a preference for a Contracts for Difference (CfD) mechanism creating a floor price of biomethane.

Regardless of preferred support mechanism, the importance of linking a future support mechanism to carbon intensity was highlighted by most respondents. It was also suggested this could be achieved by exempting biomethane emissions in the UK Emissions Trading

Scheme (UK ETS) for biomethane extracted from the gas grid, using carbon tax credits, or by designing a scheme that rewards producers based on the carbon intensity of the fuel produced.

Several respondents expressed the need for carbon capture and storage to be either incentivised or made mandatory under a new framework. Some respondents were in favour of CHP conversions being supported and a similar amount favoured a technology neutral approach for biomethane production to encourage innovative technologies to enter the sector. The most referenced technology beyond AD to be supported in the future framework was landfill gas upgraders.

Some responses emphasised the need to avoid a gap in support between the GGSS closing and the future framework to avoid any pause in investment. In addition to this, a few responses also stressed the importance of cross-government working to develop a flexible future biomethane framework.

Government response

We recognise the importance of continuing to support the production of biomethane following the closure of the GGSS, particularly given the important role biomethane is expected to play in an optimal pathway to net zero and in increasing our energy security. We expect that the extension of the GGSS to 31 March 2028 will support a smooth transition to a future framework, and we recognise the importance of avoiding a hiatus in support for biomethane between the GGSS and a post-GGSS framework.

The responses from industry throughout this consultation have been useful to develop our thinking on a future policy framework. In 2024, we intend to test our thinking on several key areas and gather further evidence on how to develop a future policy framework, which maximises the potential of the biomethane market.

The development of a future framework will be underpinned by a set of key principles to guide policy development and set a benchmark for decision making, ensuring it aligns with wider government ambitions on net zero and energy security. This will include establishing robust sustainability criteria, building on the sustainability standards embedded within the GGSS. We understand that the opportunities, challenges, and benefits associated with biomethane span across departmental remits, and we are working closely with other government departments to ensure the new framework takes account of these. We understand that biomethane production technologies not currently supported under the GGSS may have an interest in a future framework being introduced ahead of 2028; as we develop our proposals, we will consider if there are aspects of this which could be introduced sooner to support the wider biomethane industry.

Next Steps

Following this government response, the government will introduce an amendment to the Green Gas Support Scheme 2021 regulations to deliver the Mid-Scheme Review's reforms in Spring 2024 when parliamentary time allows.

This publication is available from: www.gov.uk/government/consultations/green-gas-support-scheme-mid-scheme-review

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