

Written evidence from Future Biogas (MET0036)

Introduction to Future Biogas

Future Biogas is one of the UK's largest producers of biomethane, injecting over 500 GWh of green gas into the grid each year – enough to heat over 40,000 homes.

Founded in 2008, Future Biogas is a highly experienced developer and operator of AD plants across the UK, responsible for over £200m in biogas infrastructure. At present, it operates 12 large-scale AD plants, primarily located across the East and North-East of England. Of these plants, eleven focus on the production of biomethane, injecting it into the UK gas grid. One of the sites is a 4.5 MW site producing renewable electricity via private wire to supply an RAF base in East Anglia.

Future Biogas is leading the development of Project Carbon Harvest – a venture to design and operate the next generation of AD plants delivering Bioenergy with Carbon Capture and Storage (BECCS). Each of these plants will be **100% unsubsidised**.

Biomethane and GHG removal (GGR) credits will be sold to corporate offtakers through long-term agreements. Being unsubsidised, corporates are fully funding the generation of these products. Carbon reductions and removals are entirely additional. Such an approach ensures that corporates can fairly claim full ownership of the carbon benefit. They are not supported with taxpayer money.

In 2023, AstraZeneca signed a 15-year gas supply agreement for unsubsidised biomethane from Future Biogas – [see here](#) for more information.

Future Biogas are aiming is to build over 25 new plants within the next decade – each plant will be capable of generating 100-150 GWh of biomethane and delivering 14,000-21,000 tonnes of GHG removals per year. The first of which is currently in construction.

International commitments

1) What role could methane emissions reduction play in meeting the UK's domestic and international climate change targets?

Methane is a critical greenhouse gas (GHG). Any reduction in methane emission has a significant impact on the UK's national greenhouse gas emissions. This is because methane is 28 times more potent than CO₂ over a 100-year period and over a 20-year period is approximately 8 times that of CO₂. Reductions in methane will accelerate the UK meeting its domestic and international climate change targets especially in the short term (next 20 years). However, given that the UK has already made substantial reduction compared to 1990 levels, the

approach needs to be targeted and focused on actions that both continue to make progress but also prevent reversing reductions made.

2) What is your assessment of the Global Methane Pledge: is the UK on track to meet it? If not, how could this be accelerated?

It has not been made clear how the UK government plans to meet the global methane pledge. The Environment Agency (EA) has recently announced a methane action plan to 2026 however this only includes measures for permitted sites.

The report produced by the think tank Green Alliance identifies key industries and actions that would help the UK to meet its pledge. I have provided a link to the report below. There are many simple and cost-effective actions that could be put in place that would reduce the UK's methane emissions. Examples of this include regulated leak detection and repair (LDAR), regulated reporting of LDAR surveys and emissions and ensuring third party detection is using the best available technology.

Whilst actions to reduce methane emissions are necessary it is important to ensure actions are taken to prevent emissions from rising as well. Certain UK schemes are coming to an end and there is a lack of clarity on the future of those assets. This needs to be resolved so that they can continue to operate and optimise the valuable use of methane.

[Global-methane-pledge.pdf \(green-alliance.org.uk\)](https://www.green-alliance.org.uk/global-methane-pledge.pdf)

3) What are the implications of the separate Global Methane Pledge for overall UK efforts to reduce greenhouse gas emissions?

The implication of the separate Global Methane Pledge is to highlight the sources of methane emissions and the approaches to reduce them. Currently CO₂ is highlighted as the focus and all reporting is in CO₂ equivalent. This is distracting the focus from emission reductions of other GHGs. The pledge should encourage reporting of targeted actions to mitigate methane emissions and demonstrate their overall impact on climate targets.

4) Given UK progress in methane reduction in recent years (with notable reductions before 2020) what are the cost/ benefit implications of meeting the pledge?

The UK is at a stage where the actions required to reduce methane emissions further are not lots of significant infrastructure changes but more low-cost monitoring, regulatory and legislative changes. The UK has made significant progress in diverting waste from landfill and encouraging the use of wastes such as manures and food waste for Anaerobic Digestion. Now the actions required are to continue encouraging those uptakes and incentivising those actions and to identify those who are irresponsibly releasing methane.

5) How significant are UK methane emissions when compared to global emissions? What impact could UK efforts on reducing methane emissions have on total emissions?

UK emissions of methane are not significant compared to global emissions. The IEA has identified the major emitters of methane, and these are commonly large oil and gas producing states or countries using significant amounts of coal.

[Tracking pledges, targets and action – Global Methane Tracker 2024 – Analysis - IEA](#)

6) What is the UK doing to lead and facilitate international action on methane reduction? Could this be enhanced?

Future biogas is working with the European Biogas Association (EBA) and the European Joint Research Council (JRC) to help inform European policy makers on the best practices for monitoring and mitigating fugitive methane emissions from anaerobic digestion facilities. This includes analysis of the different technologies and approaches available, the benefits from those technologies and how they can be implemented. Additionally, we are providing insights on how those results can be interpreted and used to phase out future fugitive emissions such as through improved plant designs. A copy of that report has been attached to this response.

7) What lessons could the UK learn from abroad?

There are a lot of countries introducing new legislation tightening and updating regulations on fugitive methane emissions from old and operational oil and gas facilities. The EU is currently voting on the adoption of a methane mitigation strategy for the fossil oil and gas sector and is developing a similar strategy for the biogas sector. The purpose of all these strategies is to encompass all stakeholders in the industry and ensure they take responsibility for their share in the value chain. Similar legislation should be developed in the UK.

Specific to the Anaerobic Digestion (AD) The European Biogas Association have published various reports to advise the industry on monitoring and mitigating fugitive methane emissions. Links to the reports are attached below. This has led to further work in specific countries which have produced technical and voluntary frameworks for self-inspection which give specific monitoring and reporting guidelines. This has supported the industry in regulating itself to a high standard. Copies of the Danish and Swedish frameworks are attached in the links below. The Swedish scheme reported significant improvements in the management of methane from AD plants.

EBA Report Links:

[Design-build-and-monitor-biogas-and-biomethane-plants-to-slash-methane-emissions.pdf \(europeanbiogas.eu\)](#)

[Methane-emission-mitigation-strategies-info-sheet-for-biogas-industry.pdf \(europeanbiogas.eu\)](#)

Danish Voluntary Scheme Overview:

[PowerPoint Presentation \(europeanbiogas.eu\)](#)

Swedish Voluntary Scheme:

[Self-Inspection-of-Methane-Emissions.pdf \(iwa-network.org\)](#)

Data, measurement, and monitoring

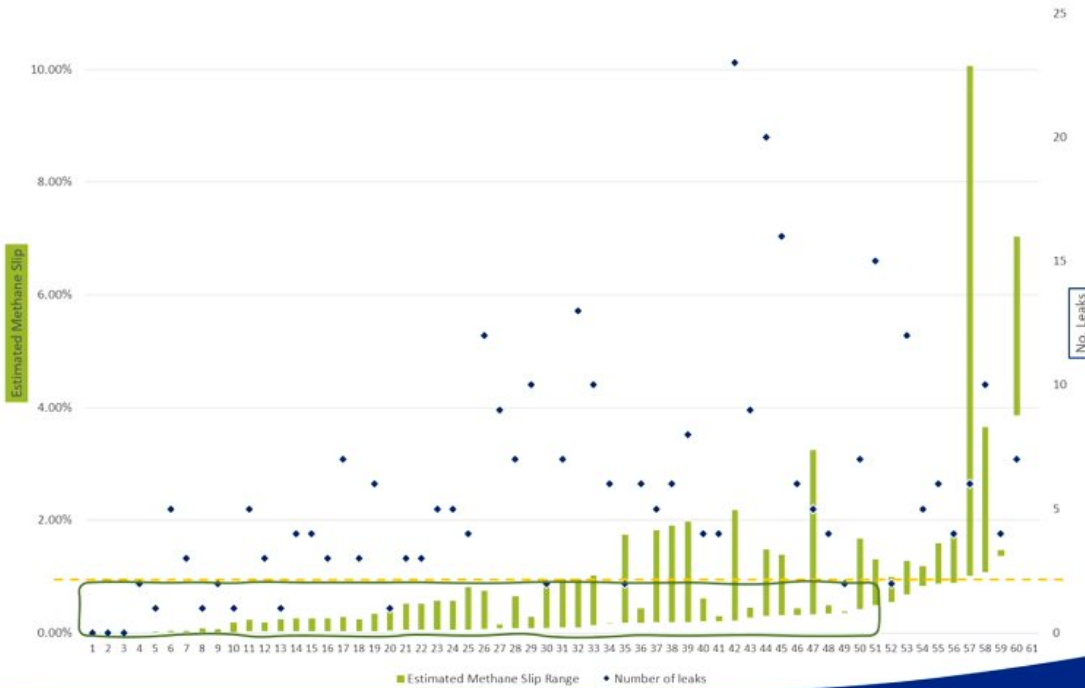
8) What is the status of methane accounting, monitoring and reporting in the UK at present and how does it compare internationally? Is UK accounting and reporting considered to be accurate and robust? What improvements, if any, are possible and what benefits would these deliver?

In terms of the Anaerobic Digestion (AD) sector, currently there is no actual measurement of methane besides the requirements within permitting. If a flare is used to burn off methane, then an estimation of the amount of methane flared must be reported. If a Pressure Relief Valve or a vent is opened this is usually measured and reported as well.

When surveying an AD plant for methane leaks there is no specification on the frequency and type of monitoring, this is all conducted on a voluntary basis unless specified within environmental permits for operation. To standardise the industry, it would be advisable to make all AD facilities permitted and to encourage practices on surveying sites for methane leakages. This is something Future Biogas have been doing at all our sites (permitted and unpermitted) and is valuable both environmentally and economically.

For carbon intensity calculations for reporting under the government incentive schemes, such as the Renewable Heat Incentive (RHI) or the Greenhouse Gas Support Scheme (GGSS), an assumption of 2% is used. Whilst this assumption will capture most of the industry's emissions, in most cases an overestimation, it will miss outliers. This can be seen from the figure attached from FM Bioenergy who conducted a survey of AD plants across the UK and Germany. The plants it does not capture will be those that are not being routinely maintained and not frequently monitoring their methane emissions. A similar study in Denmark showed that an assumed leakage of 2.5% was more representative of the industry, a link to that report is attached below.

2022-23 UK Survey Data



Since the AD sector is not a major emitter of methane, economically the methane is too valuable to be lost to the environment, internationally an assumption of fugitive methane emissions is used. There has been some development in Europe to look at more accurate methods of reporting. A voluntary reporting framework would be a useful tool, like those in place in Sweden, Denmark, and Switzerland, to give organisations a reporting structure and specifications for reporting. This would also motivate independent third-party businesses, offering surveying and reporting services, to meet this standard and use the best available techniques (BATs). Overall, this would create a uniform standard for the industry and would make reporting more transparent and repeatable.

Danish methane slip: [The Danish national effort to minimise methane emissions from biogas plants - ScienceDirect](#)

9) What progress is being made on methane monitoring and data collection in the UK using technologies such as satellite data and drones?

Technology is one of the most critical factors in reducing methane emissions. The use of the right technology in the right application is paramount. Whilst lots of progress has been made with satellites and drones, other technologies are also crucial to mitigating future methane emissions.

We are aware that the Environment Agency has access to satellite and drone services to remotely measure and monitor methane emissions. Natural England have also been using this technology to monitor and measure ammonia emissions. Using this technology to find major emitters, such as unmanaged sites and illegal landfills, would allow action to be taken promptly and mitigate emissions. These techniques should be used more for these regulatory purposes.

Other techniques such as cryogenically cooled optical gas imaging cameras (OGIs) for plant level (bottom-up) analysis are also valuable techniques that should be encouraged through a voluntary standard. These cameras have an increased sensitivity which means they can identify leaks which were not being identified by other measurement instruments and they can survey sites quickly. We have attached a report we have compiled looking into the use of different techniques for identifying and measuring fugitive methane emissions at our sites. Given the results we have purchased a cryogenic OGI camera and implemented it into our Leak Detection and Repair strategy across all our sites to improve our operations.

A simple action to improve methane emissions would be to encourage the use of this technology. Currently OGI cameras are used but they are not cryogenically cooled, so not as sensitive. A voluntary reporting framework which indicates surveying requirements would encourage the uptake of the best available techniques.

10) Are there significant methane leakages in the UK, and if so where do they usually occur?

There will be significant methane leakages in the UK that can be reduced. The report by Green Alliance highlights the key areas. The greatest concerns with methane are the unidentified sources or the sources which are not being regulated. In terms of the AD industry, we will not be a significant emitter comparative to other sectors. The AD industry is key to helping mitigating methane emissions from organic wastes such as food waste, manures, and sewage.

11) What are the advantages and disadvantages of available metrics used to report and compare methane emissions including GWP100 and GWP*?

Given that the UK has a target of net zero by 2050, the use of different reporting metrics is critical for modelling our progress to achieve this target.

UK Methane emissions and sectors

12) What progress has the UK made on reducing methane emissions and where is there room for improvement?

The UK has been very effective at improving waste management and creating strategies for waste. This includes incentivising the capture of landfill gas.

The main areas for progress are in the monitoring and regulating of emissions. The EA is currently under resourced to regulate and enforce sanctions on emitters or to capture illegal emitters. They do have access to the correct technology, but they now need to be given the enforcement powers to act.

Creating voluntary reporting standards would be an effective measure for the AD industry. This would help to standardise the industry and encourage best practices. The EU is currently working on a similar scheme as well as some legislative actions.

13) Which sectors are most promising for achieving further methane emissions reductions? And which are likely to be at least relative cost?

There are many low-cost options for reducing methane emissions.

As mentioned in preceding questions, the government has made investments into technology to find the large sources of methane emissions. Now there needs to be legislative action and resources invested into enforcing rules and applying sanctions.

A voluntary standard to encourage the use of the best technologies would also be beneficial and bringing all AD sites under the same permitting regulations would also be beneficial.

Agriculture is currently the largest emitter of methane. Improving agricultural practices to mitigate these issues, such as by changing cattle feeds and improving manure management, are low cost and would have minimal impact on consumers.

Whilst actions, such as new feeds, will reduce methane emissions from enteric fermentation from cattle the overall ambition should be to prevent growth in cattle numbers. This will have to come from changes in consumer diets and will require an education programme to inform consumers. This is also a low-cost action that would be beneficial.

The government needs to be careful with the over-incentivisation of fuels produced from manures as this is supporting the growth of the cattle industry. Whilst it is important to encourage the best uses of manures, this must be balanced so that it does not promote a positive green washing message of more cattle means more manure and more biofuel. This is becoming a more complex situation with new legislation such as the SAF mandate or the low carbon hydrogen standard which both excessively promote manure as a feedstock and would make them eligible for large financial rewards.

14) Are there sources that could be mitigated quickly and easily in the short term, and which would take longer or be more complex?

The quickest measures to implement would be regulations, implementation of voluntary standards and the increased use of best available techniques.

Longer and more complex actions include reducing cattle numbers and reducing the amount of North Sea oil and gas exploration.

15) To what extent is there existing regulation in each emitting sector to mitigate methane emissions, and how well is this working?

In the AD sector, the only regulations are part of permitting requirements. All AD sites should be brought under regulations, this can be achieved through permitting. This will also require AD operators to be responsible for the supply chain and the emissions associated with their feedstocks. A voluntary framework would be a valuable tool for identifying and measuring methane emissions from plants using the best available techniques.

Agriculture

16) Are there emerging technologies, such as methane suppressant feed products or approaches to slurry management, that could aid with methane emissions reduction in agriculture? What impact could they deliver?

No Response

17) How effective are existing policies and incentives, such as Slurry Infrastructure Grants, in driving methane reduction?

This is something we don't have experience with. However, it is important to highlight that manure is frequently over incentivised especially from the Department for Transport. This is creating a green message on the use of manures. Whilst we want to ensure that manure is used in AD as a best practice, it needs to be balanced so that it does not over emphasise the green credentials of manure and promote increased cattle populations.

18) What other policy tools, frameworks or incentives could be employed in agriculture to drive methane reduction?

There needs to be tighter regulations on spreading manure onto land. Often manure is left in piles and then spread after a harvest. This process can lead to excessive methane emissions. It would be better if more of this manure could be anaerobically digested and then spread on land as digestate.

19) How can efforts to mitigate methane emissions in agriculture be integrated into broader approaches to facilitate and incentivise climate and nature-friendly farming practices?

The agriculture sector needs support from commercial off takers and government to transition to a more resilient and sustainable future. Efforts to mitigate methane emissions in this sector need to be driven by the off takers and they need to reward farmers financially for taking those actions. This can only be achieved effectively through a strong relationship between the farmers and the off takers.

Future Biogas have been working directly with farmers for many years and we have continued to grow that relationship. This includes the implementation of an agricultural board to create a platform for strong engagement with stakeholders across the agricultural sector, please see the press release attached. This practice needs to become more common and appreciated by government as it is the most effective way to create changes within the sector and promote the best practices. This will be easier and more impactful than government imposing rules and restrictions on the agricultural community. Off takers are under pressure to create ESG strategies and to have emission reduction targets so they are already motivated to encourage these changes in their supply chains. Government needs to support this and listen to industry about the barriers and threats that they can support with.

20) How can efforts to reduce methane reduction be balanced against other important considerations in the agricultural sector, including food security?

Methane reduction, regenerative agriculture, food & energy security are not mutually exclusive. There is an opportunity, using a balanced approach, to positively improve all these variables. There is a continued approach with agriculture of categorising practices into good and bad. This influences the opinions and views of consumers and the public when realistically negative impacts are commonly the result of over intensive actions.

Agriculture has many different purposes and there needs to be a balanced approach to how land is used. This should be proportionally balanced between livestock, crops, and environmental management. This is something we expect to see from the DEFRA land Management Strategy which is yet to be published. Land management planning should decipher what is the best use for a particular area of land.

Future Biogas works with farmers, recognising the need for a balanced approach to land use and suitable applications, to positively reduce methane emissions, protect land from the impacts of climate change, restore soil health and in turn ensure future food and energy security. We do this by establishing an agreement with the farmers and agree to pay them a premium for their adherence to our criteria. I have attached a sample copy of this criteria for your interest (it is important to note that we do not use manure however the overarching principle would be applicable to farms producing manures). This criterion is constantly reviewed, for example we are currently looking at how criteria in the Sustainable Farming Incentive could be applied, so it ensures the best practices.

Waste and waste management

21) What further progress could be made in the waste and waste management sector on reducing methane emissions? Are there interventions and/or technologies that could bring emissions down?

No Response

22) Given the regulations already in place for methane reduction in the waste sector, why are emissions from the waste sector static over recent years? Are existing regulations monitored and enforced?

No Response

23) Is the UK on track to meet the Government's deadline of all local authorities collecting food waste separately from landfill by March 2026?

No Response

24) To what extent will improved methane captured at landfill sites, remain necessary to reduce methane emissions after this date?

If measures are not put in place to support landfill sites with gas capture and, most importantly, gas utilisation this could result in the UK's national methane emissions increasing. When the Renewable Obligation ends in 2028, a lot of the energy facilities capturing landfill gas will become stranded and non-operational, this will also stop any further investment. A support mechanism needs to be designed now and ready for implementation to ensure the continued success the UK has had with managing methane from landfill gas. Financial support for power production from landfill gas has a high-cost benefit as it both mitigates fugitive methane emissions as well as producing dispatchable, low carbon intensity, renewable power.

Fossil fuels

25) Are there further methane reductions that could be made in the UK fossil fuels sector (e.g., oil, gas or other fossil fuels), or at a faster pace?

26) How can we ensure that reducing methane emissions in the oil and gas sector are not at the expense of reducing CO₂ emissions?

27) What impact would bringing forward the ban on flaring and venting have on both emissions and the industry?

Venting and flaring should be last resort mechanisms for safety regulation. UK natural gas is so heavily subsidised that they should be held to the highest standards. Preventing methane venting and flaring will increase the supply security of UK natural gas and prevent the need for future exploration sites.