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future
Your Gas Network

# Accelerating biomethane in the UK

November 2025

# Executive Summary

**It is increasingly clear that biomethane will need to play a key role in supporting the UK's energy resilience and delivering decarbonisation. This is our first report on biomethane outlining our early thoughts on what we see as needed to enable a growing biomethane sector.**

Biomethane is a renewable, low-carbon gas that is already made in the UK. Today, 7 TWh are produced and injected into the same gas network that transports natural gas and is supported by government subsidy. Biomethane has the potential to play a far greater role in meeting the UK's climate targets, particularly for hard-to-abate sectors such as industry, transport and home heating.

The National Energy System Operator (NESO) sees biomethane as essential to achieving net zero by 2050, recommending production levels increase to at least 64 TWh, a nearly 10-fold increase. This is double the current government target of 30–40 TWh. Independent analysis suggests the UK could sustainably produce double NESO's ambition, up to 120 TWh by 2050, without impacting food production. This is achievable through the greater use of agricultural feedstocks such as cover crops and rotational crops, which would also support soil health and circular farming practices.

However, current policy frameworks are limiting biomethane's growth in the UK. The Green Gas Support Scheme (GGSS) is due to close to new applicants in 2028, and there is no clarity on future support. Restrictions on feedstock types, particularly the requirement that at least 50% be waste-based, are outdated and misaligned with the sector's potential to benefit UK soils and the farming sector. Additionally, the Climate Change Committee (CCC) continues to underestimate biomethane's role in decarbonising residential heating and the homes that are hard to electrify.

European countries such as France and Denmark are demonstrating how effective regulation, demand-side incentives, and collaboration between government and industry can unlock rapid growth, and we can learn from them. Europe has set itself an ambitious but realistic target that is driving the sector – similar ambition in the UK's biomethane target would be helpful. Work done by European gas networks, such as France's GRDF, also demonstrates that Cadent and the other UK gas networks can proactively prepare their networks to provide the route to market for biomethane producers. We will need to work together with Ofgem to balance the need to increase our gas network's capacity to transport more biomethane whilst minimising the impact on customer bills.

We are preparing our network to ensure we best support the growth of the sector, and want to raise awareness of the potential and value of this green gas. The report outlines what biomethane is, its potential, why it is an important part of the energy transition, and what we can learn from Europe to help scale biomethane in the UK. We draw from this a set of recommendations for gas networks, policy makers and regulators, that would drive growth in the sector in the near term, including:

- Setting a more ambitious national target of 100+ TWh of biomethane production by 2050.
- Clarifying the future policy support mechanism post-Green Gas Support Scheme to avoid a funding hiatus and provide long-term certainty for investors.
- Relaxing feedstock restrictions to allow greater use of sustainable agricultural inputs such as cover crops and rotational crops.
- Enabling biomethane to offset gas emissions within carbon accounting frameworks such as the UK-Emissions Trading Scheme and the Green House Gas Protocol.
- Creating funding mechanisms and incentives for gas networks to increase their network capacity for biomethane.

# Introduction

**The scale and complexity of the UK's transition to net zero is unprecedented, and to decarbonise the UK successfully we will need to harness all the technologies and energy sources at our disposal. Biomethane, once a niche topic in the energy sector, is increasingly being recognised for the value it can bring in helping the millions of homes and businesses continuing to rely on gas to decarbonise their energy usage.**

Biomethane is low carbon but identical to the natural gas used by homes and businesses today. It is most cost-effectively and practically transported through the UK's gas networks. Therefore, as we set out in our 2024 report 'The Future of the Gas Network'[1], Cadent recognises it has critical role to play in enabling the growth of this green gas to decarbonise the usage of gas for heat, industry, heavy goods transport and power generation. We are working hard to make it easier to carry biomethane in our network and for biomethane developers to do business with us.

This year, the National Energy System Operator set out for the first time that the UK must scale biomethane to meet net zero. We welcome this, and we have written this report to raise awareness of the benefits and challenges to scaling biomethane in the UK and what we can learn from our European neighbours. From these, we have drawn out early recommendations on what players from across the energy system, including the gas networks, the UK Government and its advisory bodies need to be doing to enable more biomethane in the UK.

1: Future of the Gas Network, Cadent, September 2024

# Section 1. Biomethane : A Green Gas Solution

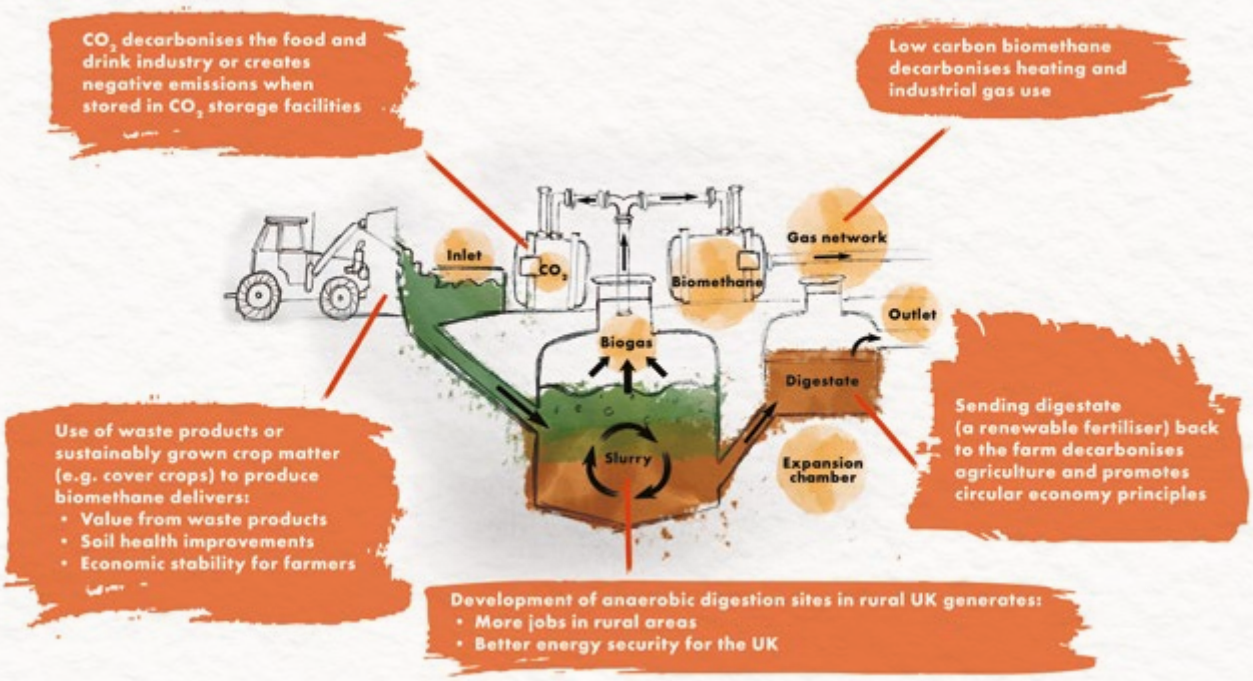



Figure 1: Producing biomethane delivers sustainability and economic benefits.

## What is biomethane?

Biomethane is a renewable alternative to fossil natural gas. It is made from biogas, which is typically produced from anaerobic digestion (AD), where organic matter (such as agricultural residues, food waste, and sewage sludge) is added to a sealed tank containing microorganisms that break it down. Biogas is also produced at landfill sites, as waste naturally breaks down.

Once generated and collected, biogas can be upgraded to biomethane by removing and storing the $CO_2$. The resulting gas is methane that is chemically identical to natural gas. This means it can be mixed into the gas network without needing pipeline modification. Because it has been produced from organic matter that can be re-grown, it does not create additional emissions from natural gas (fossil methane) and is therefore renewable and 'low carbon'.

## By-products support a circular economy for farmers

The anaerobic digestion process also creates biogenic-$CO_2$ and digestate, both of which have immediate practical use and can provide economic value for farmers.

Biogenic-$CO_2$ has end uses in the food industry or can be stored underground using CCUS technology, making the anaerobic digestion process potentially net carbon negative by taking $CO_2$ out of the energy system.

Digestate is a nutrient-rich organic waste left in the anaerobic digestor after the biogas is produced. It can be used as a fertiliser on farmland, providing circular benefits to farmers making biogas.

**Case-study:** The movement Biogasdoneright[2] in Italy sees farmers at the forefront of championing anaerobic digestion, because they recognise that AD enables them to:

- Rest their arable land and improve the soil health, by growing feedstock for AD in rotations with food
- Make an income from their marginal (non-food producing) lands
- Be more self-sufficient, by producing their own fertiliser (digestate) and even tractor fuel (compressed biomethane)

2: Biogasdoneright: An innovative new system is commercialised in Italy, Dale et al, 2016

## How biomethane is transported

Nearly all biomethane intended for use for home or industrial heat and power is injected into the gas network[3]. Biomethane production sites are widely distributed across the UK according to feedstock availability, which means they typically inject into the more widely dispersed gas distribution networks, often at their lower pressure tiers.

When there is low demand for gas in the summer from businesses and homes, it can hamper the ability for biomethane to be injected into the gas network. Gas network operators are looking at ways to support the flow of more biomethane, for example compressing gas to a higher pressure tier or storing gas when demand is low. We must ensure we are not the bottleneck in enabling green gases like biomethane to play their role in decarbonising the UK's gas use.

## Implications

- Biomethane produced from anaerobic digestion provides a broader opportunity than just energy generation. More needs to be done to understand the broader value across $CO_2$ and fertiliser in order to 'valorise' all parts of the process.
- We have an important role to play in enabling more biomethane to be produced in the UK by providing the injection capacity in the gas networks.

## Our early recommendations

### For the gas networks

- Increase network capacity where commercially or technically feasible, particularly in lower-pressure (2-7 bar) networks, to enable biomethane developers to maximise their production.
- Streamline and standardise as much as possible the network connections process, making network connections easier and faster for anaerobic digestor developers to secure.

### For Ofgem

- Create funding mechanisms and incentives for the gas networks to increase their network capacity for biomethane.

3: DESNZ, Digest of UK Energy Statistics, July 2025

# Section 2: There is untapped potential for biomethane to scale in the UK

**There is potential for biomethane to contribute far more to the UK energy system than Government or its advisors (NESO & the Climate Change Committee) are targeting.**

### UK Institutions' views on biomethane potential

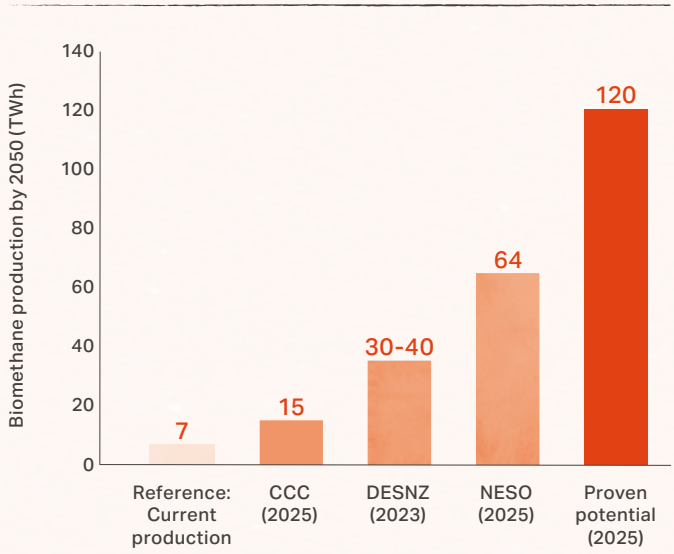



Figure 2: Biomethane ambition across the UK energy landscape. Note: CCC figure is for 2040, CCC's ambition for biomethane in 2050 not published.

Recent research by Alder Bioinsights, commissioned by the Green Gas Taskforce[4], has conservatively estimated there will be potential for 120 TWh of biomethane in the UK by 2050. Their report considers the issues of competition for feedstock alongside an evaluation of the impact on farming and farmland.

Displacing natural gas with 120 TWh of biomethane would mean between 20% and 90% of the UK's gas demand by 2050 is low carbon (dependent on future gas demand scenarios). This is in line with the IEA's latest report, Outlook for Biogas and Biomethane, which estimates that approximately 25% of the global gas demand could be displaced by biomethane by 2050[5].

4: For more information, see greengastaskforce.co.uk. 5: Outlook for Biogas and Biomethane, IEA, June 2025

## Biomethane growth potential, by feedstock type (TWh)

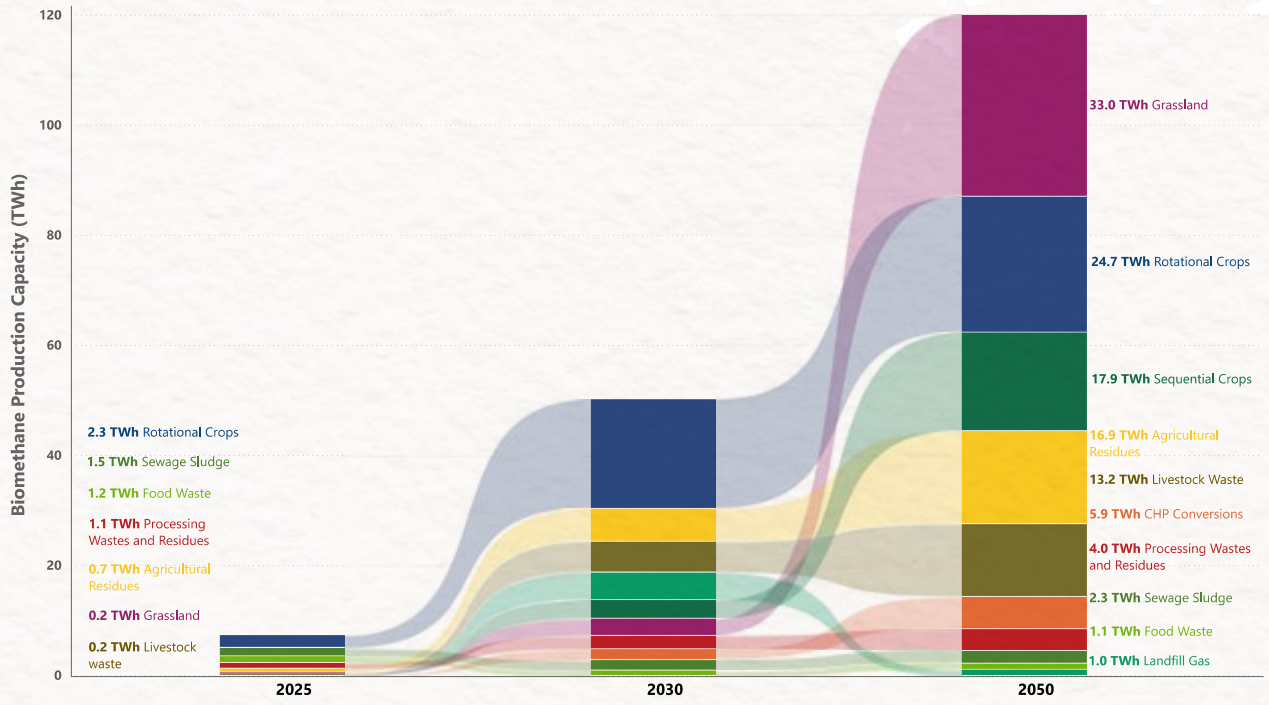



Figure 3: Potential production capacity of biomethane in the UK, based on biomass feedstock availability[6].

The Government ambition for biomethane was set by DESNZ in their 2023 Biomass Strategy. This strategy targets 30-40 TWh of biomethane being injected into the gas networks by 2050, or four to five times the current levels of 7 TWh[7]. Their ambition was limited by a concern that more biomethane could not be made without impacting food production – the analysis by Alder Bioinsights shows this is not the case.

NESO have also begun to challenge this view[8]. In their latest Future Energy Scenarios (FES) publication, NESO have concluded that producing 64 TWh of biomethane by 2050 to displace natural gas is necessary to meet the UK's legally binding climate targets, including Net Zero by 2050. The chart below outlines NESO's vision for biomethane growth. We believe there is scope for biomethane to play an even greater role to decarbonise the UK's energy supply at the lowest cost and greatest reliability.

## Biomethane injected into the UK gas networks according to National Energy System Operator

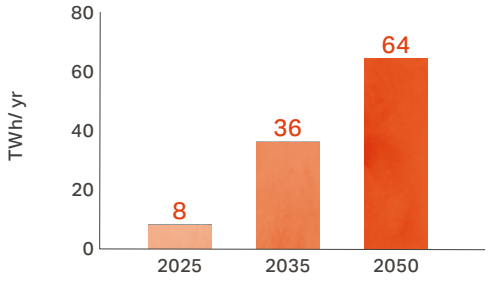



Figure 4: Minimum required biomethane levels to reach net zero by 2050, as outlined in the "Holistic Transition" scenario in the 2025 Future Energy Scenarios[9].

6: Outlining the feedstock potential for biomethane generation, Alder Bioinsights, September 2025. 7: Biomass strategy, DESNZ, August 2023. 8/9: 2025 Future Energy Scenarios, National Energy System Operator, July 2025.

Meanwhile, advice to Government from the Climate Change Committee (CCC) on how to reach net zero targets very low levels of biogas and biomethane (15 TWh by 2040). This has been driven by the assumption that biomass feedstock will be limited in availability and so should be directed towards industry (e.g. burning biomass to generate energy, or using biomass to create sustainable aviation fuel).

As we discuss in the next section, this assumption conflates various forms of biomass that are not all suitable for burning or making making biogas and biomethane – waste biomass is often best suited to make biogas and biomethane. Additionally, this assumption ignores the huge role biomethane can and should play in helping hard-to-abate homes to decarbonise, such as through hybrid heating systems of a gas boiler with a heat pump[10]. This is a strategy being employed in other European countries.

## Producing more biomethane will not impact UK food production

Achieving these biomethane production levels relies on growing biomethane feedstocks alongside food crops, for example as cover crops (crops grown to keep soil covered between rotations) or part of crop rotations to boost soil health (e.g. one out of every five rotations). These biomethane production levels are therefore sustainable without impacting food usage, which is understandably a concern of both DESNZ and DEFRA.

Current policy however restricts the use of such feedstocks in producing biomethane, by providing no financial support to AD plants fed by more than 50% non-waste feedstocks. Alder Bioinsights' work shows this is not needed, and is limiting the growth of the sector and making decarbonising the UK's energy supply more challenging.

## The Government has an opportunity to set out a greater biomethane ambition

DESNZ currently supports biomethane production for injection into the gas networks through the Green Gas Support Scheme (GGSS). This scheme was launched in 2022.

The GGSS closes to new applicants in 2028, and clarity on the future policy framework for biomethane is expected in 2026. This future policy package is an opportunity for Government to be more ambitious on biomethane, especially considering the Government's renewed focus on ensuring home-grown energy and energy security – both of which biomethane helps to deliver.

## Implications →

- The UK can produce significantly more biomethane than the current target set out in the Biomass Strategy.
- Higher volumes of biomethane will be needed to help the UK meet its climate targets.
- Agricultural anaerobic digestion feedstocks such as cover crops and rotational crops can be sustainably grown without impacting UK food – however, restrictions on the use of these feedstocks (mislabelled "energy crops") in current policy are limiting the growth of the biomethane industry.

## Our early recommendations

### For the UK Government

- Clarify the future policy support mechanism for biomethane as soon as possible, to ensure there is no funding hiatus in the sector.
- Set a more impactful but still achievable target of 100+ TWh by 2050 (compared to today's target of 30-40 TWh).
- Relax the current policy restriction that at least 50% of biomethane feedstock needs to be from waste and residues.

### For the UK advisory body CCC

- Remove the constraint that biomass can only play a role in decarbonising industry, recognising that biomethane has a role to play in helping decarbonise hard-to-abate home heating through hybrid heating systems powered by biomethane.

10: 7th Carbon Budget, Climate Change Committee, February 2025

# Section 3: Biomethane is a cost-effective and sustainable source of energy

**Biomethane is cost effective, and can be produced sustainably – both from an emissions perspective and without competing with other bioenergy sources.**

## Producing biomethane to displace natural gas reduces the cost of delivering net zero

Producing biomethane to displace fossil fuel natural gas is a cost-effective approach to carbon abatement. Recent research by Baringa, commissioned by the Green Gas Taskforce, has estimated that greater biomethane volumes (100+ TWh by 2050) could reduce the total cost of reaching net zero by 2050 in the UK by £174bn.

These savings are primarily derived from:

- **Transport:** Additional biomethane creates more headroom in the carbon budget, delaying the need to make costly investments in decarbonising transport while still achieving net zero emissions
- **Power generation:** Biomethane can support a greater role for gas to deliver reliable power and provide cost-effective carbon abatement
- **Buildings:** Biomethane makes gas boilers a net zero viable solution for the hardest-to-abate homes, complementing the roll out of heat pumps in the UK
- **Power grid:** Biomethane reduces the emissions intensity of the gas grid, reducing the investment required to upgrade the power grid to accommodate additional electricity demand and renewables

Total cost savings to deliver net zero with greater biomethane production (£billions)

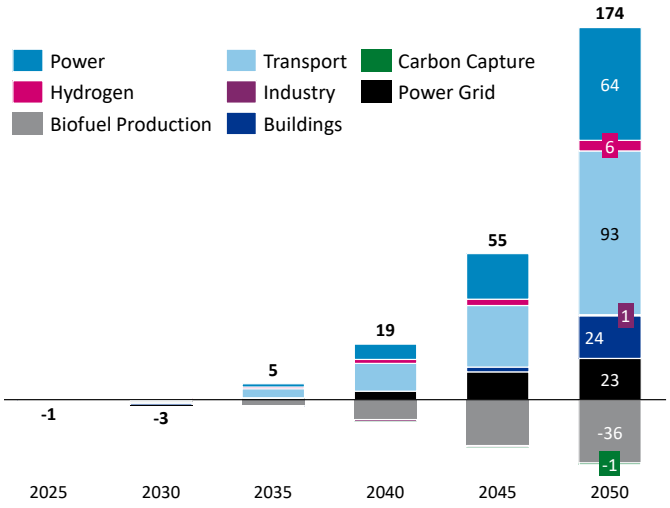



Figure 5: Cumulative cost savings to deliver net zero under Baringa's modelling, which sees biomethane production levels rise to 100+ TWh by 2050.[11]

## Methane leakage during biomethane production is not a reason to limit support for biomethane

Minimising methane leakage from the anaerobic digestion process is critical to deliver sustained carbon savings.

Well-run production plants operating at scale in the UK will typically have leakage rates of 5% or less[12] due to effective controls put in place on the plants.

In Denmark the sector's methane leakage has been proven to be as low as 2.5% through effective regulation[13]. Leakage of biomethane must be taken seriously by the sector with appropriate controls in place at all sites, and certification schemes such as Anaerobic Digestion and Bioresources Association's (ADBA) are critical to ensure best practice.

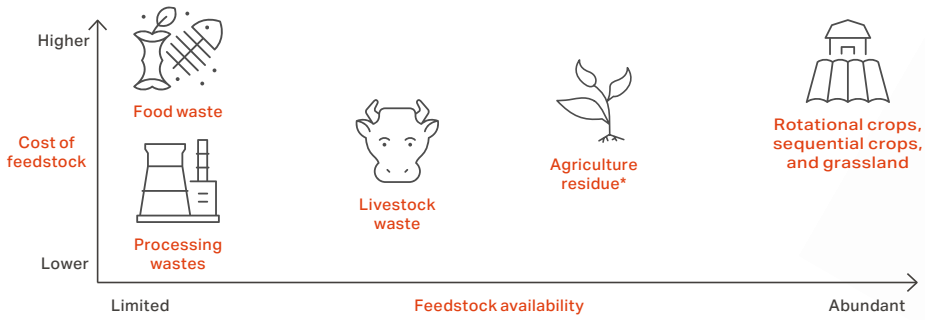
11: Reducing the cost of net zero with biomethane, Baringa, October 2025.12: Methane emissions along biomethane and biogas supply chains are underestimated, Bakkaloglu et al., Imperial College paper, June 2022. 13: Ramboll, Study on methane loss from biogas plants for the Danish Energy Agency, Ramboll, 2021.

## Biomethane does not compete with other bioenergy for feedstocks

Biomethane has unhelpfully been conflated with negative press around the unsustainable use of woodland for energy. The anaerobic digestion process relies on different types of organic materials than the power plants deriving energy from woody biomass.

Feedstocks for AD have also been dismissed as potential feedstocks for Sustainable Aviation Fuels (or SAF). Growing feedstocks for SAF can actually complement feedstocks for biomethane.

### Feedstock families used to produce biomethane




### Feedstock families used to produce sustainable aviation fuel (SAF)

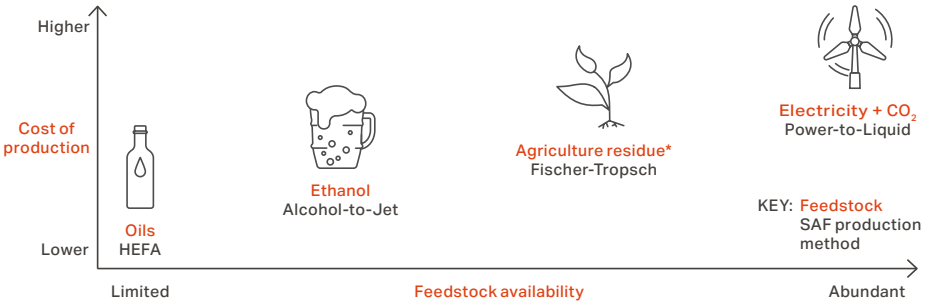



Figure 6: Feedstock families used as production sources for biomethane and for Sustainable Aviation Fuel (SAF)[14]. Adapted from BP.

There are four main pathways to make SAF from biomass, outlined in the chart above. The most common uses vegetable and waste cooking oils, which work poorly in AD plants[15]. Two alternative production methods positively impact feedstock for biomethane: Alcohol-to-Jet and Power-to-Liquid. Alcohol-to-Jet SAF is produced from ethanol created through the fermentation of biomass.

The residue of this fermentation process is commonly used as an effective AD feedstock. Power-to-Liquid SAF is made by combining biogenic-$CO_2$ with green hydrogen (hydrogen made from electrolysis of water using renewable electricity). The anaerobic digestion process is one of the most cost effective ways to produce biogenic-$CO_2$.The last method, called Fischer-Tropsch (FT), is the only method which has potential to drive up competition for feedstock[16]. However, FT SAF is not yet commercialised and currently costs 4x more than jet fuel to produce.

## Implications →

- Mitigating methane leakage from biomethane production is important, but is not a major problem in the sector. However, the sector must continue to improve, and make use of best practice guidelines and certification schemes to weed out poor performers.
- Biomethane feedstock isn't in competition with energy from waste or SAF.

## Our early recommendations

### For the UK Government

- Ensure that modelling for future financial support for biomethane includes the costs of managing leakage to low single digits (net of revenue from sale of the gas).

*Agricultural residue includes straw, produce that does not meet the quality grade for food retail, beet tops, etc. 14A: Reducing the cost of net zero with biomethane, Baringa, October 2025. 14B: Outlining the feedstock potential for biomethane, Alder Bioinsights, September 2025. 14C: How all sustainable aviation fuel (SAF) feedstocks and production technologies can play a role in decarbonizing aviation, BP, April 2023. 15: The Journey of SAF, Aviation International, April 2023. 16: How all sustainable aviation fuel (SAF) feedstocks and production technologies can play a role in decarbonizing aviation, BP, April 2023.

# Section 4: There are valuable learnings we can take from Europe

**The UK was an early leader in the biomethane industry and set an example for European markets. Whilst the UK has made progress since the early 2010s in growing biomethane, it is falling behind Europe. The EU might have over six times the population of the UK, but they now have ten times the biomethane ambition for 2030 that the UK has in 2050.**

| | Population | Current gas demand | Current biomethane production | Production target |
|---|---|---|---|---|
| UK | 70m | 700 TWh[17] | 7 TWh, 1% of gas demand[17] | 30-40 TWh by 2050 |
| EU | 450m (x6 vs UK) | 3600 TWh[18] | 31 TWh, 1% of gas demand[19] | 366 by 2030 (x10 UK 2050 target)[20] |
| — France | 70m | 370[21] | 13 TWh, 4% of gas demand[22] | 52 TWh by 2030[22] |
| — Denmark | 6m | 20[23] | 8 TWh, 40% of natural gas demand[24] | 13 TWh by 2030, 100% of forecast natural gas demand[26] |

Table 1: Comparison of UK vs EU current biomethane production and production targets

All EU countries are expected to contribute to this goal, but France and Denmark are leading the way.

France has seen huge success, achieving a remarkable 53% year on year growth rate in biomethane production from 2015 to 2023. Their gas distribution operator GRDF has connected 13 TWh of biomethane production, and plan to grow this by four times by 2030. This is five times faster than the UK's ambition as set out in the 2023 Biomass Strategy.

GRDF's success in France has been enabled by two key pieces of support from their Energy Regulator (CRE)[25]:

- Up to 60% of the costs to connect biomethane producers to the gas network are socialised across GRDF's customer base.
- A regulatory framework called 'right to inject' to the gas networks, which recommends the lowest cost solution for connecting a local biomethane producer into the gas network. This is enabling GRDF to increase network capacity ahead of need.

Denmark has also seen great success in biomethane. Production has grown 17% year on year from 2015 to 2023, supported by an effective subsidy scheme. Biomethane now makes up over 40% of the gas in Denmark's gas network, and the industry has set itself the ambitious target of making this 100% by 2030[26].

Most importantly for these countries, this growth is being achieved without impacting farmland or food production and is providing an additional income for farmers.

17: Digest of UK Energy Statistics, DESNZ, July 2025. 18: Monthy gas consumption data, Eurostat, 2025. 19/24/26: Feasibility of REPower EU 2030 targets, European Biogas Association, July 2022. 20: REPowerEU Plan, European Commission, May 2022. 21: French gas demand hits 16-year low in 2024, Montelnews, January 2025. 23: Ceer, Danish Natural Gas Markets, September 2024. 22/25: Biomethane Connect Europe, GRDF, March 2025. Presentations available upon request. 26: Biogas in Denmark, Danish Energy Agency, 2025.

BIOMETHANE PRODUCTION IN FRANCE AND DENMARK [27]

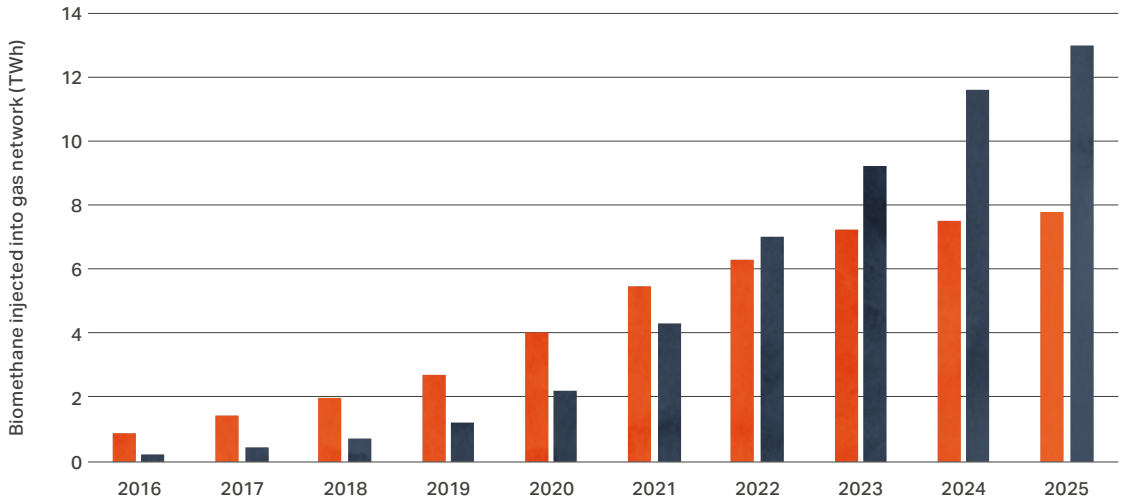



Figure 7: Biomethane production growth in France and Denmark

## Spurring demand to boost production

Europe is increasingly driving the sector's growth by incentivising demand rather than incentivising production. Under its Emissions Trading Scheme (the EU-ETS), the EU allows businesses to purchase biomethane certificates of origin to offset against their restricted emissions. The UK Government and accounting protocols such as GHG Protocol should also permit this to enable industrial gas users to source biomethane to reduce their emissions. France has also set a gas supplier obligation, requiring gas suppliers to source at least 1.8% of their gas from biomethane in 2027, increase to 4.2% in 2028[28].

A demand-side obligation is in use today already in the UK for transport fuels (the Renewable Transport Fuel Obligation, or RTFO), and could form the basis of a similar scheme for green gases transported in the gas network.

## Implications →

- An ambitious national biomethane target can encourage growth.
- GRDF's work in France makes clear that Cadent have an important role to play in providing the route to market for biomethane producers. Their collaboration with their regulator has been crucial, and we will need to work together with Ofgem to balance the need to boost our network's capacity to transport biomethane whilst minimising the impact on customer bills.
- Demand side obligations, such as a requirement to source an increasing percentage of gas supply from biomethane, can be effective.

## Our early recommendations

### For the UK Government

- Set demand-side obligations or incentives for the use of biomethane in the future UK biomethane policy and Emissions Trading Scheme (ETS), to minimise the taxpayer impact of growing the sector.

### For the companies running carbon accounting mechanisms (e.g. GHG Protocol)

- Enable biomethane to be used to offset gas emissions as a route to decarbonise in carbon accounting protocols.

27: Source for Danish data: Biogas in Denmark, Danish Energy Agency, 2025. Source for France data: various, available on request. 28: Decree No. 2024-718 of 6 July 2024 on the obligation to surrender biogas production certificates, French Government, July 2024

# Early recommendations to better support biomethane in the UK

We know that our colleagues across the energy sector are exploring the role biomethane can play in the energy system. Drawing from the learnings above, we have some early recommendations that would enable more biomethane to be made. We will be exploring these in more detail over the next year:

**For the gas distribution networks**

- Urgently increase network capacity, particularly in lower-pressure (2-7 bar) networks, to enable biomethane developers to maximise their production.
- Streamline and standardise as much as possible the network connections process, making network connections easier and faster for anaerobic digestor developers to secure.

**For Ofgem**

- Create fundings mechanisms and incentives for the gas networks to increase their network capacity for biomethane.

**For the UK Government**

- Set a more impactful but still achievable target of 100+ TWh by 2050 (compared to today's target of 30-40 TWh).
- Clarify the future policy support mechanism for biomethane as soon as possible, to ensure there is no funding hiatus in the sector.
- Set demand-side obligations or incentives for the use of biomethane in the future UK biomethane policy and Emissions Trading Scheme (ETS) to minimise the taxpayer impact of growing the sector.
- Relax the current policy restriction that at least 50% of biomethane feedstock needs to be from waste and residues.
- Ensure that modelling for future financial support for biomethane includes the costs of managing leakage to low single digits (net of revenue from sale of the gas).

**For the UK advisory body the Climate Change Committee**

- Remove the constraint that biomethane can only play a role in decarbonising industry, recognising that biomethane has a role to play in helping decarbonise hard-to-abate home heating through hybrid heating systems powered by biomethane.

**For the companies running carbon accounting mechanisms (e.g. GHG Protocol)**

- Enable biomethane to be used to offset gas emissions as a route to decarbonise in carbon accounting protocols.

# Notes

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