

Scaling Up Biomethane in the European Union

7 December 2021

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Sasha Twining



Welcome & Introduction

Sasha Twining



The relevance of biomethane

Dominique Mockly, Chairman & CEO Teréga



Keynote address

Kadri Simson, European Commissioner for Energy



Presentation of 'Biomethane Declaration' to Commissioner Simson

Thierry Trouvé, CEO GRTGaz Ivan Junga, CEO Hutira Kristian Eriknauer, Vice President Arla Foods

OUR VISION FOR BIOMETHANE

Biomethane is the most cost effective, scalable and sustainable renewable gas available today¹. Biomethane has a long-term role to play in the future climate-neutral energy system, to meet the "Fit For 55" reduction of GHG emissions target (55% by 2030). Furthermore, biomethane contributes to sustainable agriculture, rural jobs that are hard to displace and recovery of waste streams. Biomethane therefore should be scaled up rapidly across the EU. This requires increased investments, policy support, cost reductions and optimising overall revenues for producers.

Biomethane finds use across the economy and has a particularly high energy system value in:

- industry (for high temperature heat that cannot be electrified, or for biogenic carbon feedstock);
 power (to balance the grid with storable and
- dispatchable energy);
- transport (for long distance heavy transport and maritime that cannot easily be electrified);
- buildings (in existing buildings with gas connections through hybrid heat pumps).

We, the undersigned companies and associations, seek to mobilise the biomethane supply chain to highlight the benefits and opportunities related to biomethane and to partner with public stakeholders to ensure support for a large, Europe-wide scale-up and use of sustainable biomethane. We collectively have the ambition to scale up biomethane application in Europe. We believe that 350 TWh², or 33 billion cubic meters, by 2030 is achievable, avoiding about 110 Mt CO_{2eq} emissions³.

This scale-up can be achieved through collaboration along value chains, partnerships on large and innovative investment plans and by reducing production costs, and to make such projects visible. We wish to partner with European and national institutions to optimise the role of biomethane in achieving climate targets and to remove regulatory barriers. We look forward to cooperating with all interested stakeholders to boost biomethane in Europe.



- ¹ We consider renewable methane from various sources, such as via anaerobic digestion, gasification and as synthetic methane produced from renewable electricity and carbon dioxide.
- ² This equates to around 10% of projected natural gas consumption in 2030. Based on European Commission (2018) % Clean Planet for all' communication.
 ³ Savings are based on a comparison of lifecycle emissions, and result from avoiding emissions from natural gas production and use, avoiding atternative waste treatment, avoiding total savings on a comparison of lifecycle emissions, in a result from avoiding emissions from natural gas production and use, avoiding atternative production pathways, the total savings could even be higher.

7th of December 2021

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Response by EU Commissioner

Kadri Simson, European Commissioner for Energy



Biomethane scale-up potential

Sacha Alberici, Associate Director Guidehouse

Biomethane scale-up potential European Commission modelling shows significant demand for biomethane to 2050

- European Commission's 'A Clean Planet for All' communication sees an important long-term role for biomethane in the transition to a climate-neutral economy by 2050*
- 350 TWh (30 Mtoe) demand in 2030, equivalent to 10% of projected natural gas consumption
- Between 520 TWh (45 Mtoe) and 920 TWh (79 Mtoe) demand in 2050 depending on scenario (with additional potential from emethane)
- Combined biogas and biomethane production in 2020 was 191 TWh (of which 159 TWh was biogas)





*2030 and 2050 biomethane demand converted from Mtoe to TWh (and rounded)

Biomethane scale-up potential How do the European Commission estimates compare to other studies?



European biomethane potential to 2050



Several studies see a potential that corresponds well with the EC's estimate

2050 Most studies assume a significant further scale-up for 2050, but the picture that emerges is varied

Biomethane scale-up potential Biomethane supply 2040-2050 – study comparison



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*None of the studies include biomethane from energy crops or roundwood **IEA and Engie studies cover additional countries – only EU+UK included in this analysis

Biomethane scale-up potential Strategies to scale-up biomethane

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Increase anaerobic digestor & biomethane upgrading plant size	Upgrading biogas production to biomethane	Continued technology innovation	Investing in commercial scale gasification plants	Demonstrating & implementing sequential cropping
 Increase new digester size to min. 500 Nm³/hr can be achieved by farmers through pooling feedstock Increase size of ungrading plants to at 	 All newly commissioned digestion-based biomethane plants should be connected to gas grids and existing biogas supply should transition to biomethane 	 Further efforts to increase digester and gasifier efficiencies Developing novel pre- treatment technologies to enable lignocellulose substrates (e.g. straw) 	 Investing in commercial scale gasification plants (200 MW+) Long-term policy framework required that supports biomethane gasification, while also 	 Research to test implementation in more temperate parts of Europe as well (in particular key European agricultural regions, such as Germany, Romania
least 1,000 Nm ³ /hr – can be achieved through large integrated plants or by pooling biogas from multiple plants to a central upgrading plant	 where it can realise greatest societal benefit Implementing grid capacity solutions, such as in-grid compression of gas, can facilitate 	and woody biomass) to be more easily biodegraded in digesters	targeting continuous cost reductions to minimise societal costs	 and Poland) Large-scale training and awareness-raising programmes

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Benefits of biomethane

Harmen Dekker, Director EBA



Biomethane – Uniquely placed Benefits of biomethane

Harmen Dekker, EBA Director Brussels 7th December 2021

The voice of renewable gas in Europe

Sustainable biomethane fulfills more than 1 goal of the EU Green deal



A full circular and sustainable model with multiple direct benefits





Sustainable biomass feedstocks for biomethane production such as:





Preventing methane emissions

53% METHANE EMISSIONS COME FROM AGRICULTURE



Animal farming results in large quantities of manure, which naturally releases methane. These emissions can by avoided by using the manure for biomethane production.

26% OF METHANE EMISSIONS COME FROM WASTE



Producing biomethane from bio-waste reduces methane emissions from landfills and wastewater treatment installations.



Biogas is an important tool in reducing the economic gap between urban and rural areas and supporting sustainable, long-term rural development:

Farmers producing biogas have their own source of renewable energy, find support from additional sustainable business models and can considerably reduce their carbon footprint.

The innovative model of **circular farming with biogas production can include carbon farming** and is based on:





Using waste as a resource

Untapping the potential of industrial wastewater

The EBA demonstrated that it is possible to recover around 14 Mtoe (142 TWh) of biogas (raw form of biomethane) per year by valorising industrial wastewaters from the spirits, biodiesel, pulp and paper, beer, vegetable oils, ethanol, meat, and cheese sectors.

Most of those studies on biogas/biomethane potential do not yet consider the large potential from industrial wastewaters.





The production of biomethane is the result of a biological process which does not increase GHG concentrations in the atmosphere, but makes it circulate in short carbon cycles.

At the end of the production process, **we can recover CO2 from biomethane upgrading**, removing as such CO2 from the atmosphere and use it as raw material to produce, for instance, synthetic fuels.

Biogenic CO2 is very important as source in our CO2 use within Europe compared to abated fossil CO2.





A cost-competitive renewable gas for buildings, transport and industry

The multiple applications of biomethane include:

- Heat and power supply for buildings and industry
- Fuel transport: including negative emissions considering the full lifecycle of the vehicles.

2 reasons extra reason why biomethane requires direct attention and support

- It is directly scalable and can immediately help hard to abate sectors like transport, industry and build environment
- The existing gas **infrastructure** is biomethane-ready.

Positive externalities of biomethane production

- GHG emissions reduction (including negative carbon footprints)
- Waste processing
- Replacement of mineral fertilisers
- Increased agronomic value of soils through the application of digestate
- Carbon storage in soils through the application of digestate and the Biogasdoneright concept
- Capturing biogenic CO2

This combination of pathways to avoid GHG emissions makes it possible to create an even negative carbon footprint.





THANK YOU!

Harmen Dekker, EBA Director <u>dekker@europeanbiogas.eu</u>

www.europeanbiogas.eu

The voice of renewable gas in Europe



Scaling-up biomethane

Ole Hvelplund, CEO Nature Energy



nature energy

Scaling up biomethane

Presentation by Ole Hvelplund, CEO Nature Energy

Today, we produce a third of the biogas in Denmark



- Nature Energy is one of the world's largest producers of biogas.
- Our first biogas plant was established in 2015 and we now have 11 plants in Denmark and operate one plant in France.
- Further, we are establishing new biogas plants in the Netherlands, France, Canada and in the US.
- In 2020, we turned 3.5 mil. tonnes of biowaste into 125 mil. m³ biogas, which corresponded to around 25 % of the total amount of green gas in the Danish gas grid.
- In 2021, we increase the biogas production by a third. This means that we will provide the Danish gas grid with 33 % of the total amount of biogas - in the world's greenest gas grid with approx. 20 pct. biogas in 2021 increasing to 70 pct. in 2030!



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Biogas is circular economy when it is best



Production of carbon fibers for e.g. plastic production, bicycles and kayaks



Our way of producing biogas holds a great export potential





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Biomethane in transport

Michele Ziosi, Vice President Institutional Relations CNH Industrial / IVECO

IVECO NET ZERO CARBON IN EUROPE BY 2040

...through the progressive adoption of Alternative Propulsion





IVECO HEAVY TRUCKS EUROPE

HCV POWERTRAIN MI



DIESEL

progressively dropping, to go below 50% before 2030

GAS

today the only alternative to Diesel, to keep growing also in the medium/long-run driven by the growing availability of bio-methane

ELECTRIC TRUCKS

at 5-10% by 2025 to reach 20-30% by 2030 FCEV to overcome BEV before 2030



BIO-METHANE CIRCULAR ECONOMY

Bio-methane delivering today the Circular Economy model targeted in 10 years by EVs

TRANSFORM WASTE INTO RESOURCE





IMPORTANCE OF RENEWABLE FUEL vs CO₂ REGULATIONS

The EU's overall climate goals can be achieved faster and with greater certainty using sustainable renewable fuels as an additional path to reduce CO₂ emissions from the EU vehicle fleet.





KEY CHALLENGE

All biomethane value chain stakeholders need to join forces supporting the further development of the technology and promoting the recognition of the biomethane role and contribution in the achievements of the CO_2 reduction target in HDT transport.

CO,

MAKE BIO-LNG AVAILABLE FOR EVERYONE







Member State support on biomethane

Wolfgang D'Innocenzo, Energy Attaché - Permanent Representation of Italy to the EU Biomethane in Italy challenges and opportunities

Scaling up biomethane in Europe

Wolfgang D'Innocenzo Permanent Representation of Italy to the EU

7 December 2021



Italy NECP ambitious on renewables in transport

Italy has a high RES-T target: 22%

One third of the target will be met through advanced biofuels, 75% of which trough advanced biomethane

Background

- natural gas in transport is an Italian specialty
- three quarters of natural gas vehicles in the EU circulate in Italy
- the number of CNG filling stations exceeds 1.100 and consumption is around 1,1 bcm

Tools

the 2018 biomethane incentive scheme provides for up to 1.1 bcm p.a. for transport;

Opportunity

switch the supply of natural gas in transport to biomethane

Challenges

implementation of existing legislation
increased climate ambitions by 2030



1. 2018 biomethane scheme: Feedstocks and production capacity

Current feedstocksGrape marcs and wine lees5%Animal manure and sewage sludge1%Biomass fraction of industrial waste11%Biowaste from private households (separate collection)84%

Open issues

Revision of Annex 9a (by 21/06/2021)

- letter d) "Biomass fraction of industrial waste not fit for use in the food or feed chain": interpretation of "residue" vs. "waste" for plant licensing purposes
- increase feedstocks

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Prodution		
2017:	9 mcm	•
2018:	29 mcm	•
2019:	50 mcm	
2020:	99 mcm	•
2021:	140 mcm (forecast)	
2022:	0,6 bcm (forecast)	•
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2. New advanced Biomethane scheme

In addition to the pre-existing "biomethane-in-transport" scheme, the NECP envisaged a scheme of biomethane for non-transport uses;

Key figures

- 2,3 bcm p.a. by 2026
- Total cost €2,7 16bn in 15 years based on gas & ETS prices
- use of RRP funds;
- 80% minimum GHG savings threshold (mandatory from 2026) applied

Lessons learned

- long lead time (2-3 years), with even longer if use of MSW;
- incentives for use of agricultural waste and residues need to be higher than for MSW, otherwise not convenient

Lessons learned that can be implemented across other Member States to help scale-up biomethane

Fine tuning of incentives is necessary: as price fluctuate, an adjustment is needed to match the trend in energy and CO2 markets

Key provisions

- a single incentive system with tariffs expressed in €/MWh,
 differentiated on the basis of the costs of plants, regardless of
 the intended use (transport or other uses);
- a two-way system for assigning incentive tariffs through descending price auctions (for all types of plants), so as to comply with the European regulations on state aid;
- a capital grant on eligible investment costs incurred, within the limits of the maximum eligible investment cost and according to specific percentages;
- annual quotas made available in line with PNRR expenditure deadlines, with specific expenditure constraints for new plants in Southern Regions and aimed at exploiting the potential of the conversion of existing biogas plants;
- a reciprocity mechanism with other Member States.



Thank you for your attention!





For more information:

The Biomethane Declaration can be accessed via: <u>News - Gas for Climate 2050</u>

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