INDUSTRY

Industry accounts for ≈21% of EU energy-related CO_2 emissions [1]. Although the EU is very active to reduce emissions (-13.5%, IEA 2022) [2], not all processes can be quickly and effectively decarbonised. In 2021, natural gas constituted 32.7% of EU industry's final energy consumption [3], underscoring the unlimited demand for a ready to use, carbon neutral, alternative to fossil gas.

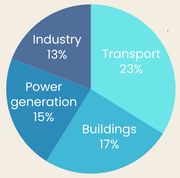
DO YOU KNOW BIOMETHANE'S ROLE IN INDUSTRY?

Biomethane, a renewable gas produced from sustainable feedstocks, is chemically similar to natural gas, enabling its integration into existing infrastructure and use across sectors. Its demand is increasing, especially in hard-to-abate sectors, while biomethane offers advantages to industries like food and beverages. It supports waste management and a circular economy through partnerships where industries supply their waste as feedstocks and utilise the resulting biomethane and biogenic CO_2. This growing demand is driven by both regulatory decarbonisation requirements, such as the EU-ETS, voluntary targets and the increasing pressure from companies across the supply chain and consumers.

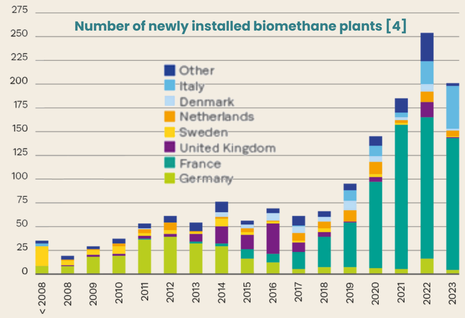
Biomethane can reduce greenhouse gas emissions by over 80% compared to natural gas, and can even achieve negative emissions depending on the feedstock [5]. Additionally, biomethane is produced with European technology that is already being scaled up quickly and cost-effectively, allowing a fast reduction of fossil CO_2 emissions for end consumers.

4.9 bcm
EU biomethane production in 2023

6.4 bcm/y
EU installed biomethane production by Q1 2024



Biogas uses in 2023 [4]



Guarantees of Origin (GOs) and Proof of Sustainability (PoS) are disclosure tools backed by third party certifications, that enable industries to meet decarbonisation targets and reduce carbon emission costs. One example is **Italy**, where biomethane will be traded and used in substitution of natural gas for industrial, heating and high efficiency cogeneration use.

BUILD ENVIRONMENT (HEATING)

With 36% of energy-related GHG emissions (EU), buildings are key contributors to climate change [6]. Biomethane has a key role to help decarbonising this sector, particularly the building stock.

DO YOU KNOW BIOMETHANE'S ROLE IN BUILDINGS (HEATING)?

A mix of solutions will be required to decarbonise the building sector in the most cost-effective and resilient manner, including building renovation, smart energy usage, electrification, and the replacement of fossil fuels with renewable and low-carbon alternatives. Biomethane stands out, as it can directly replace natural gas in both existing individual and collective gas boilers or be used to generate heat in cogeneration units and heat-only plants that supply district heating networks. Biomethane can also be used in combined systems. Hybrid heat pumps, for example, consist of an integrated gas boiler and heat pump, along with an intelligent control system that optimises the operation of both heat generators. This optimisation can be based on factors such as the CO_2 content of the electricity mix at any given moment or potential power grid constraints during peak hours, thereby contributing flexibility to the energy system. Hybrid systems also allow for the optimisation of heat pump sizing, reducing its overall cost.

The energy source makes the difference, not necessarily the heating system itself. Most systems such as boilers, electric heating/heat pumps and district heating systems, can operate with both fossil or renewable alternatives.

FACTS & FIGURES

≈70% of ≈105 million space heaters in EU-27 were operating on gas in 2019 [7].

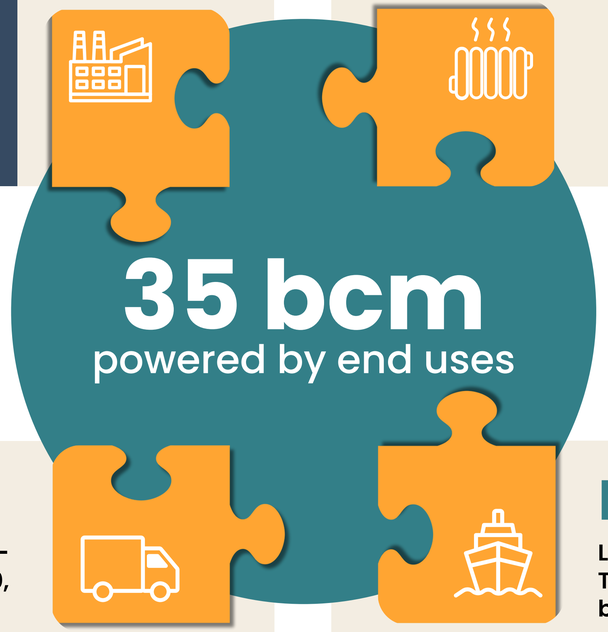
Efficient condensing gas boilers remain the most sold heating technology in Europe (>10 million in 2021 and 2022) [8].

By end of 2021, Europe housed 1,067 biomethane facilities [9], 184 more than in 2020.



France has planned, and the **Netherlands** is set to introduce, **obligations** on gas suppliers to incorporate biomethane in their supply to residential and commercial buildings, which could lead to additional **biomethane demand** of **10-12 TWh** in each country in the years to come. **Germany** mandates at least **65% renewable energy** in **buildings**, potentially creating additional **biomethane** demand of up to **45 TWh** by **2040**.

Good to know: If properly designed, such schemes can help countries to comply with targets in the **Renewable Energy Directive** and the **EU ETS**.



BIP Task Force 2 took a deep dive on the role of **end uses** in contributing to the target. The **sustainability criteria** and **voluntary certification schemes** introduced by **RED** have provided a clear framework to stimulate the development of sustainable biomethane across Member States. **Uptake by end users** is **key** to reach the target.

For more information, consult the **BIP Task Force 2 report** 'A vision on how to accelerate biomethane project development' on bip-europe.eu.

BIP Europe
Biomethane Industrial Partnership

ROAD TRANSPORT

The HDT gas market is projected to grow from ≈50000 to 100000 trucks in 2025-2030 and would require a biomethane consumption of ≈3 bcm/y in 2030, representing 8,4% of the 35 bcm target [10].

FACTS & FIGURES

• Significant investments have been made in refuelling infrastructure for methane, counting more than +750 LNG and +4,200 CNG stations, ready to supply biomethane [14].

• The EBA database assessed the growth of bio-LNG-producing plants:

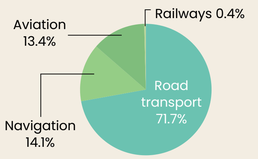
2023	2024	2025	2027
59	+46	+14	>134

• Biomethane is expected to become a dominant fuel for HDVs by 2030 [15]. Currently, 14 EU countries [16] are actively involved in bio-LNG production. Italy, with the largest fleet of gas vehicles in Europe, utilises all of its biomethane production (7,330 GWh in 2023) as transport fuel [17].



DO YOU KNOW BIOMETHANE'S ROLE IN ROAD TRANSPORT?

The transport sector is responsible for a significant share of Europe's GHG emissions, with road transport accounting for around 71.7%. Although electric vehicles (EVs) are increasingly common, certain segments of the transport sector, especially heavy-duty transport (HDT), will likely see only a 10% electrification by 2030 [12]. As a result, sustainable biomethane will be essential for decarbonising these sectors in line with the Paris Agreement. Biomethane is a highly effective solution for decarbonising HDT, achieving at least a 80% well-to-wheel (WtW) CO_2 emission reductions compared to diesel [13].



GHG emissions from domestic transport in the EU by segment [11]

For transport buyers prioritising cost-effective solutions with significant WtW CO_2 reductions, biomethane stands out. It often combines a competitive total cost of ownership (TCO) with substantial emissions' savings, consistently delivering on both environmental and economic metrics. Biomethane can be used in existing gas infrastructure, including the CNG and LNG refuelling stations across Europe, avoiding the need for major new investments and offering a cost-effective and scalable solution.

Voluntary certification schemes have been a key development factor for biomethane across different **EU Member States**, for instance feeding the transport sector's decarbonised fuel need in **Germany** and the **Netherlands**. Long-term policy support and incentives have also been a booster in countries as **Italy** and **Scandinavian countries**, where the production of biomethane has grown at unparalleled speed in 2019-2025, and transport has been the most focused sector. Also, in **Sweden**, the share of biomethane in the transport gas mix is well over 95%, which has been supported long-term both upstream (e.g. incentives for investing in biogas production) and downstream (e.g. tax exemption for biomethane as a vehicle fuel).

MARITIME SECTOR

LNG vessel technology can use bioLNG, which offers a 65% to 100% GHG reduction. To match the 2030 FuelEU Maritime GHG reduction target, less than 15% of the 35 bcm target would be sufficient.

FACTS & FIGURES

• Tonnes of CO_2 emissions in 2023 by maritime transport:

>127 million = **3-4 % of total EU emissions [18]**

• BioLNG potential for reduction of emissions compared to fossil LNG:

>%92 **with the potential for negative emissions**

• FuelEU Maritime mandates a 6% carbon intensity cut by 2030, making accelerated sustainable biomethane production key for deeper reductions beyond then.

DO YOU KNOW BIOMETHANE'S ROLE IN THE MARITIME SECTOR?

As of January 2024, the EU ETS includes the maritime sector, requiring ships over 5,000 gross tons to account for their emissions. This development may incentivise the use of low-carbon fuels, such as biomethane. Using biomethane can significantly reduce GHG emissions compared to conventional marine fuels, contributing to the decarbonisation of the maritime sector. Biomethane, as bioLNG, can serve as a renewable fuel for the sector, especially considering that starting in 2025, the FuelEU Maritime Regulation mandates a gradual reduction in the greenhouse gas intensity of shipping fuels, beginning with a 2% decrease. BioLNG can already be used in the existing and growing ordered vessel fleet on LNG technology. In 2010, ≈20 vessels were running on LNG. This number will exceed 1.000 by 2028 according to the existing order book. The need for bioLNG in shipping is large. A strong unique and connected EU market is required to access sufficient volumes of bioLNG.

The latest **IMO assessment** indicates that the international shipping industry is responsible for approximately **3% of global emissions**. European authorities have introduced bold measures aimed at reducing the sector's GHG emissions, including its inclusion in the **EU ETS** and the adoption of the **FuelEU Maritime Regulation**. To support the transition to greener energy sources, there is a clear need for bio-LNG dedicated infrastructure in ports. Establishing such infrastructure would facilitate the widespread adoption of green LNG by providing the necessary refuelling and logistical capabilities.

GROWTH OF LNG-FUELLED FLEET



Source: DNV AFI
sea-lng.org

Annex

INDUSTRY

[1] Climate Transparency, 'Climate Transparency Report 2022: European Union', 2022, https://www.climate-transparency.org/wp-content/uploads/2022/10/CT2022-EU-Web.pdf.
[2] Eurostat, 'Industry relied mostly on natural gas & electricity', 12 May 2023, https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20230512-1 .
[3] International Energy Agency, 'CO_2 Emissions in 2022', March 2023, https://iea.blob.core.windows.net/assets/3c8fa115-35c4-4474-b237-1b00424c8844/CO2Emissionsin2022.pdf.
[4] European Biogas Association, 'EBA's Statistical Report 2024', 2024.
[5] Sacha Alberici, Marissa Moultak, and Jaap Peters, 'The Future Role of Biomethane', Gas for Climate, December 2021.

BUILD ENVIRONMENT (HEATING)

[6] EU Commission, 'Energy Efficiency in Buildings', 2020.
[7] European Commission, 'Space Heaters – Energy Efficient Products, Energy-efficient-products.ec.europa.eu, https://energy-efficient-products.ec.europa.eu/product-list/space-heaters_en.
[8] European Heating Industry (EHI), 'Heating Market Report 2023', Brussels: EHI, 2024, https://ehi.eu/wp-content/uploads/2024/04/2023_EHI_ANNUALREPORT.pdf.
[9] European Commission, 'JRC Publications Repository: Biogas production in the EU in 2022', Publications Office of the European Union, 2024, https://publications.jrc.ec.europa.eu/repository/handle/JRC135079.

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ROAD TRANSPORT

[10] The calculations are based on the current fleet size and projected growth rates as per the latest available data from the European Alternative Fuels Observatory (EAFO). These estimates reflect today's vehicle fleet composition and anticipated trends but may be subject to change with updated market developments and policy shifts. European Union (EU27) | European Alternative Fuels Observatory.
[11] European Biogas Association, 'Biogases: Beyond Energy', Factsheet on transport, 2023.
[12] SEI, net-zero-trucking-seireport-10.51414-sei2021.025-1.pdf.
[13] Sphera, Product Sustainability Software and Data Suite, Sphera (GaBi).
[14] Eurogas website.
[15] Gas for Climate, 'New Study on Biomethane Production Potentials in the EU', https://gasforclimate2050.eu/new-study-on-biomethane-production-potentials-in-the-eu/.
[16] European Biogas Association, 'EBA's Statistical Report 2024', 2024.
[17] European Commission, 'State Aid SA.48424 (2017/N) – Italy - Support scheme for the production and distribution of advanced biomethane and other advanced biofuels for use in the transport sector', 01 March 2018, C(2018) 1379 final, https://ec.europa.eu/competition/state_aid/cases/269927/269927_1973623_186_2.pdf.

MARITIME SECTOR

[18] European Commission, 'EU Climate Action Progress Report 2024', COM(2024) 498 final, 31 October 2024, https://climate.ec.europa.eu/document/download/d0671350-37f2-4bc4-88e8-088d0508fb03_en.