

Project report

Biomethane Industry Barometer 2025

A project by

dena

Legal information

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1 Introduction and key messages

The industry barometer has been analysing key developments and trends in the German market since 2012 using a comprehensive survey and by collecting market data. It has therefore become a key publication on the mood in the industry. The biomethane industry is currently being shaped by five key developments and trends. It is clear that uncertainties currently prevail, but stabilising factors could also strengthen the market in the medium term:

The situation in the German biomethane market is tense: Political uncertainty, a lack of incentives, market distortions due to insolvencies, low prices and cases of fraud are creating challenges and uncertainty in the market. As a result, opinions on the current business situation are the most pessimistic since the survey began. Without effective subsidy mechanisms and sufficient investment security, the enormous potential of biomethane in Germany will remain untapped. However, some companies are leveraging the crisis to strengthen their market position – for example by acquiring plants, increasing efficiency and diversifying their sales markets, for example in the heating and maritime sectors.

Decreasing biomethane demand and lump in the EEG market: Demand for biomethane remains at a low level compared to existing production capacities. The insolvencies of the two largest biomethane traders have had a significant negative impact on the operation of EEG plants. In 2024, around 1.1 TWh fewer certificates for end consumer points were decommissioned than in the previous year. By as early as 2023, the decline compared to the reference year was already 0.9 TWh. Overall, the renewable energy industry has shrunk by more than a third over the past two years. This is also reflected in the continued fall in biomethane prices for renewable energy quality. Despite falling trading prices and significant amendments to the Renewable Energies Act (EEG), there were no bids for the 2025 biomethane tender – for the fourth time in a row.

Energy Industry Act creates legal and investment security for feed-in: The amendment to the Energy Industry Act (Energiewirtschaftsgesetz, EnWG) makes it possible for feed-in projects that have already been registered to be implemented in accordance with the applicable conditions of the Gas Network Access Ordinance (Gasnetz-zugangsverordnung, GasNZV). For future planning, however, it is crucial that the Federal Network Agency's determination procedure for reorganising the grid connection conditions for biomethane plants is completed as quickly as possible in order to ensure planning security for new projects from next year.

RED III drafting could lead to a stabilisation of GHG quotas and the market: In the transport sector, the FuelEU Maritime Regulation (EU) 2023/1805 and the implementation of the RED III requirements are increasingly reshaping the transport sector. The fundamental revision of the GHG quota – in particular through adjustments to the minimum quota for advanced biofuels, the multipliers and the import regulations for biofuels from Asia – could bring the long-awaited stabilisation of the quota prices and thus of the market itself. According to current plans, the changes will come into force next year. It remains to be seen what changes will be made to the law in the parliamentary process.

Potential in the heating market remains largely untapped: In the heating market, demand for biomethane remains low despite the fundamentally favourable framework conditions in the Building Energy Act (Gebäudeenergiegesetz, GEG). The scarcity of GEG-compliant gas tariffs, ongoing political discussions about the structure of the law and sluggish heating modernisation efforts are currently among the biggest challenges in Germany. Meanwhile, international biomethane trading with the heating market as the sales target continues on its dynamic growth course. Other European countries, for example, often have better funding conditions and more ambitious expansion targets. In several countries, plants are now being built that are specifically designed for export to Germany. In addition to the utilisation obligations in the heating market under federal and state legislation, the main market drivers here are emissions trading (European Emissions Trading System (ETS) and the German Fuel Emissions Trading Act (BEHG)) and the utilisation of renewable gases for sustainability reporting.

2 Background to the industry barometer

The "Biomethane Industry Barometer" survey has been conducted annually by dena since 2012 as part of the biogas partnership. The results provide a comprehensive data basis with assessments, opinions and forecasts from industry players on current developments, opportunities and challenges in the biomethane market. Data is collected using a questionnaire, one-on-one interviews and data from the German Biogas Register and relevant third-party publications.

The industry barometer provides in-depth monitoring of the market development of biomethane by combining the results of the survey with national and international trends.

The Biogas Partner Project

The dena biogas partnership brings together market players along the entire biogas feed-in value chain and supports their activities to shape the market. The German Energy Agency (dena) assumes the role of moderator and offers a platform for the coordinated exchange of knowledge and experience as well as for the national and international procurement and processing of information. In this way, the biogas partnership is making an important contribution to the accelerated defossilisation of all energy consumption sectors and thus to achieving the German government's energy and climate policy goals. The "Biogas Partners" project involves the key biogas players from agriculture, plant construction, the energy industry and science.

Representatives from 31 German and European companies in the biomethane industry took part in the survey. Answering the questions was voluntary; there were no compulsory questions. The survey was conducted using an online survey tool. The link to the survey was sent directly to the relevant companies by e-mail. The survey period ran from 4 June to 2 August 2025.

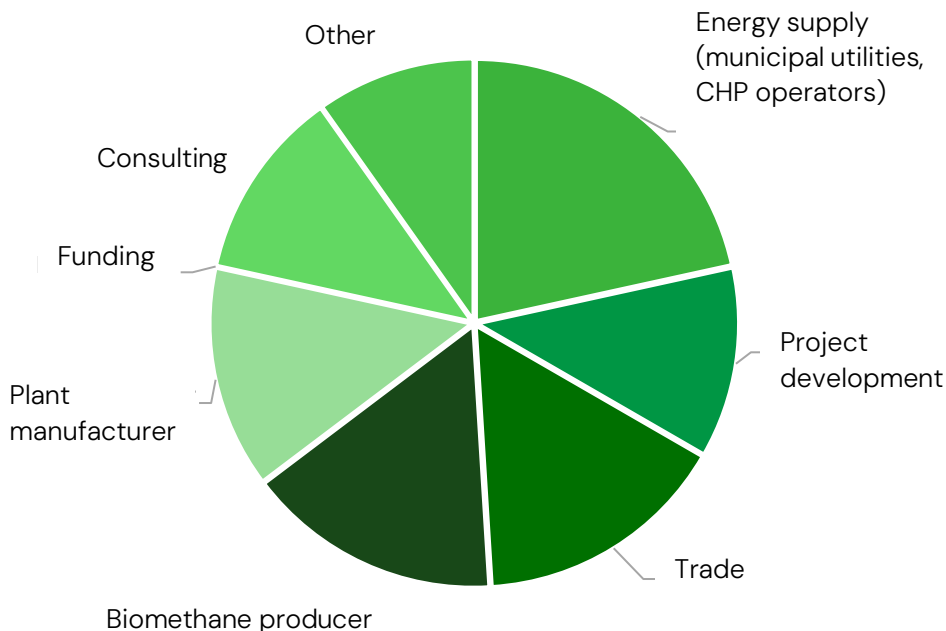


Figure 1: Companies participating in the survey by biomethane value chain [multiple answers possible]

3 Status quo of biomethane feed-in in Germany

Plants in planning and construction

The construction of new plants has largely remained at a similar level in recent years, which is mainly due to the stagnating demand for biomethane and the frequently changing framework conditions, which have made long-term investment planning much more difficult.

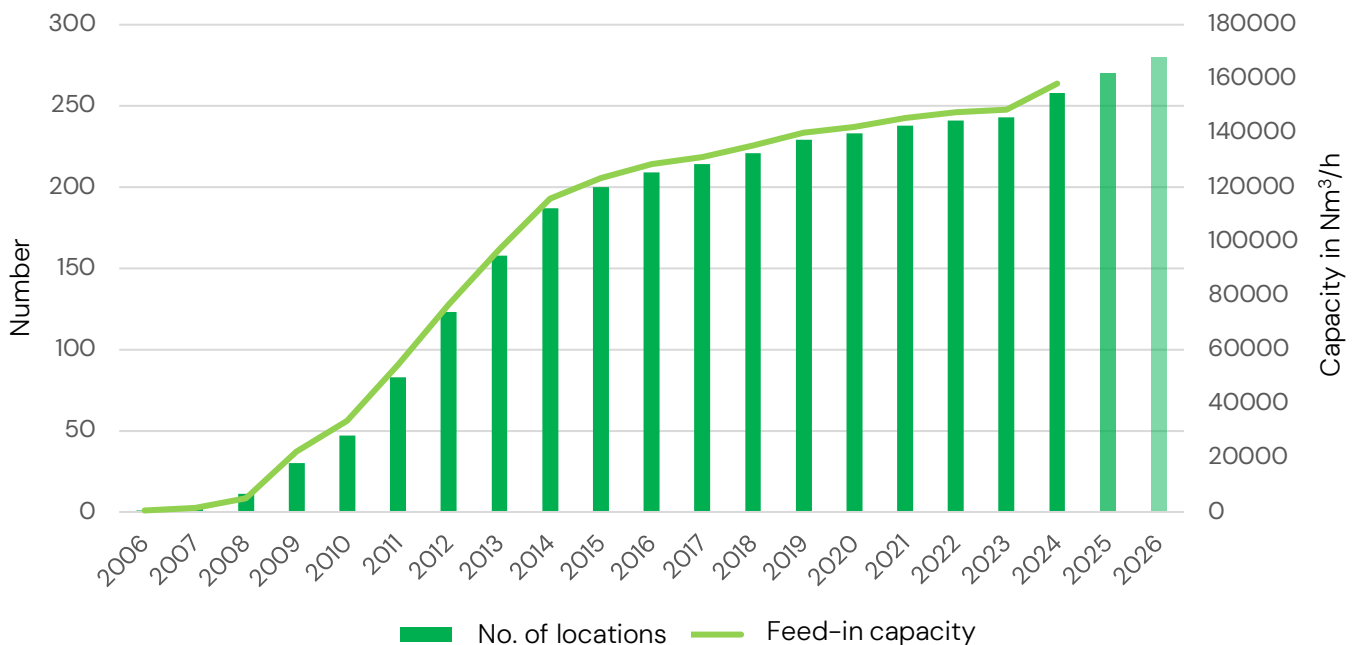


Figure 2: Number and capacity of plants in Germany from 2006 to 2026 (source: own graphic, dena 2025)

At the beginning of the decade, however, there was a significant increase in grid connection requests. A grid connection request is the first step in the grid connection process. It includes an inspection of the availability of potential connection points, the required pipe routes and technical equipment as well as a cost estimate, the total costs of which must be partially borne by the connection recipient upon implementation. A complete inspection usually incurs costs in the low five-figure range. It is therefore often set for an early stage of planning, when it is not a reliable indicator of the actual likelihood of a project being realised. The sharp rise in requests was primarily due to the high GHG quota prices during this period. A large proportion of the 300 or so grid connection requests submitted also related to biogas projects with on-site electricity generation, whose EEG subsidy period will soon expire and which already use significant quantities of liquid manure for biogas production. With the sharp fall in trading prices since the beginning of 2023, many of these projects will likely have come under financial pressure, as production costs have not fallen to the same extent following the gas crisis. Nevertheless, there was a stronger increase in the number of plants in 2024 and 2025 than in previous years, which is mainly due to the long implementation times of the projects. Compared to the previous year, respondents estimate the probability of realisation of planned projects to be significantly higher – an indication of generally higher market confidence and a long-term increase in demand for biomethane (see Figure 3). The previous legal regulations on the grid connection of biogas upgrading plants to the gas supply grid and the feed-in of biomethane will expire on 31 December 2025 with the Gas Network Access Ordinance (Gasnetzzugangsverordnung, GasNZV). At the same time, the requirements of the internal gas market package, which also provides for specific regulations for biogas, must be transposed into national law. While, in future, the natural gas grid access regulations for biomethane will be determined directly by the Federal Network Agency, it was not clear how ongoing projects will be dealt with. This has recently led to considerable uncertainty in the planning of grid connections, as no reliable profitability calculations could be made for new projects. This uncertainty was reduced by the amendment to the Energy Industry Act in August 2025, at least for ongoing grid connection requests. A transitional regulation was created according to which the

previous regulations of the GasNZV continue to apply for plants that have submitted a grid connection request by 31 December 2025 and have paid the advance on costs – usually 25 per cent of the total costs, due a few weeks after the grid connection inspection has been commissioned.

For many plants, grid connection is a decisive factor in project planning, as the process can take up to three years. This is confirmed by both the survey results and the expert interviews conducted (see chart).

How likely do you think it is for planned projects to be implemented at the present time?



Figure 3: Change in the assessment of the probability of realisation of projects started in 2024 and 2025

Personnel bottlenecks, a lack of experience and a lack of process standardisation have a particularly inhibiting effect on grid operators – especially when several procedures have to be managed in parallel. In addition, there are supply bottlenecks for components for redundantly designed feed-in plants, which can further delay the process.

In your experience, how long does the grid connection process currently take from initial enquiry to completion?	24 – 30 months
How long do the authorisation procedures for a BImSchG permit currently take?	12 – 24 months

Table 1: Duration of authorisation and grid connection process in months

The required BImSchG (Federal Immission Control Act) authorisation is also a time-consuming and lengthy process that can take up to two years. The process is also very idiosyncratic and is not clearly standardised and depends on the responsibilities and experience of the authorities involved. Common additional requirements – such as additional expert assessments on noise and environmental protection, as well as public participation or the involvement of further specialist departments – can also lead to considerable delays. However, the federal government has recognised the problem of lengthy authorisation procedures. For this reason, Articles 15 and 16 of the Renewable Energy Directive contain provisions to speed up the relevant processes. In the Netherlands, the authorisation procedure can take as little as twelve months. Digitalisation is set to shorten the processes even further in the future. In France, too, the authorisation period is generally around ten months, provided that it is carried out in a concentrated authorisation procedure.

Biomethane feed-in

Biomethane feed-in increased slightly again in 2024 compared to the previous year. The main reason for this is the stronger increase in the number of plants in 2024 compared to previous years. As in previous years, the average full-load hours of biomethane production plants have remained almost constant. Based on the installed capacity, this results in a utilisation rate of around three quarters. This would allow significantly more biomethane to be produced as demand increases. However, both technical and authorisation-related restrictions stand in the way of expanding production. In addition, the output depends largely on the substrates used and their methane yield.

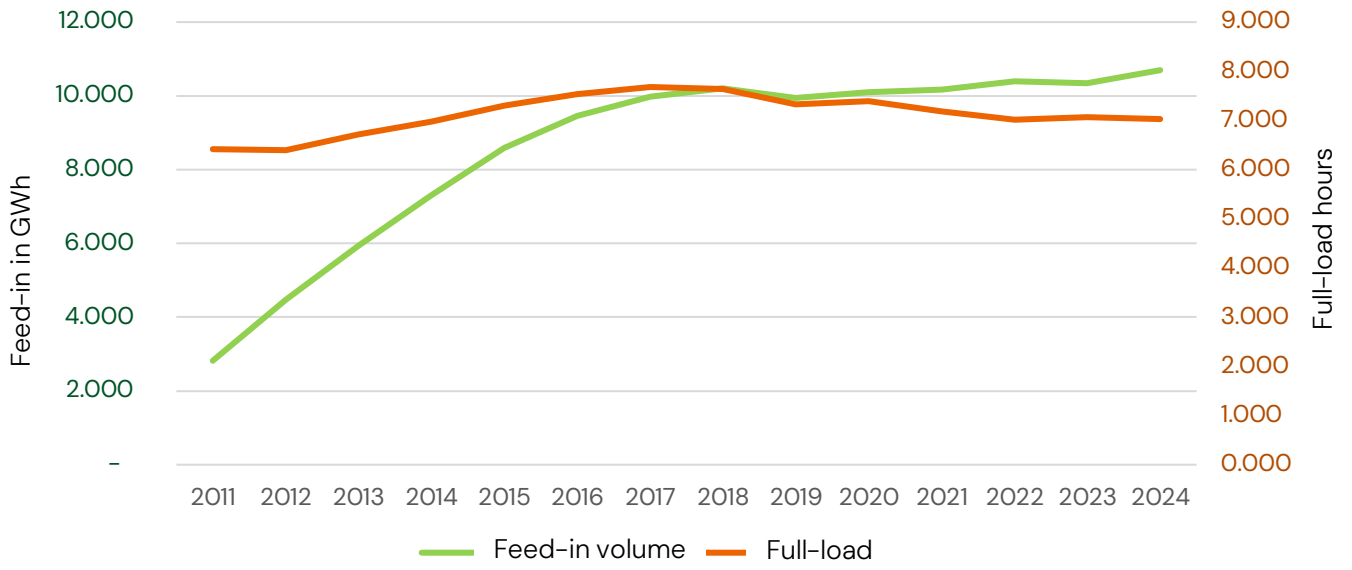


Figure 4: Feed-in volume and full-load hours of German plants from 2011 to 2024 (source: own graphic, dena 2025)

4 Development of input materials

The trend towards the increased use of liquid manure is continuing even with lower GHG quota prices. One reason for this is that the requirements for greenhouse gas savings in accordance with RED III will continue to increase in the electricity and heating sectors over the next few years and many plant operators are already aligning their plants with these future requirements. The increasing use of liquid manure is much more pronounced in existing plants than in new plants, which, with a mass-based use of liquid manure of around 25 per cent, are more in line with the average for all plants. Ultimately, the use of residual materials for producing biogas depends mainly on the regional availability of raw materials, regardless of whether it is a new or existing plant.

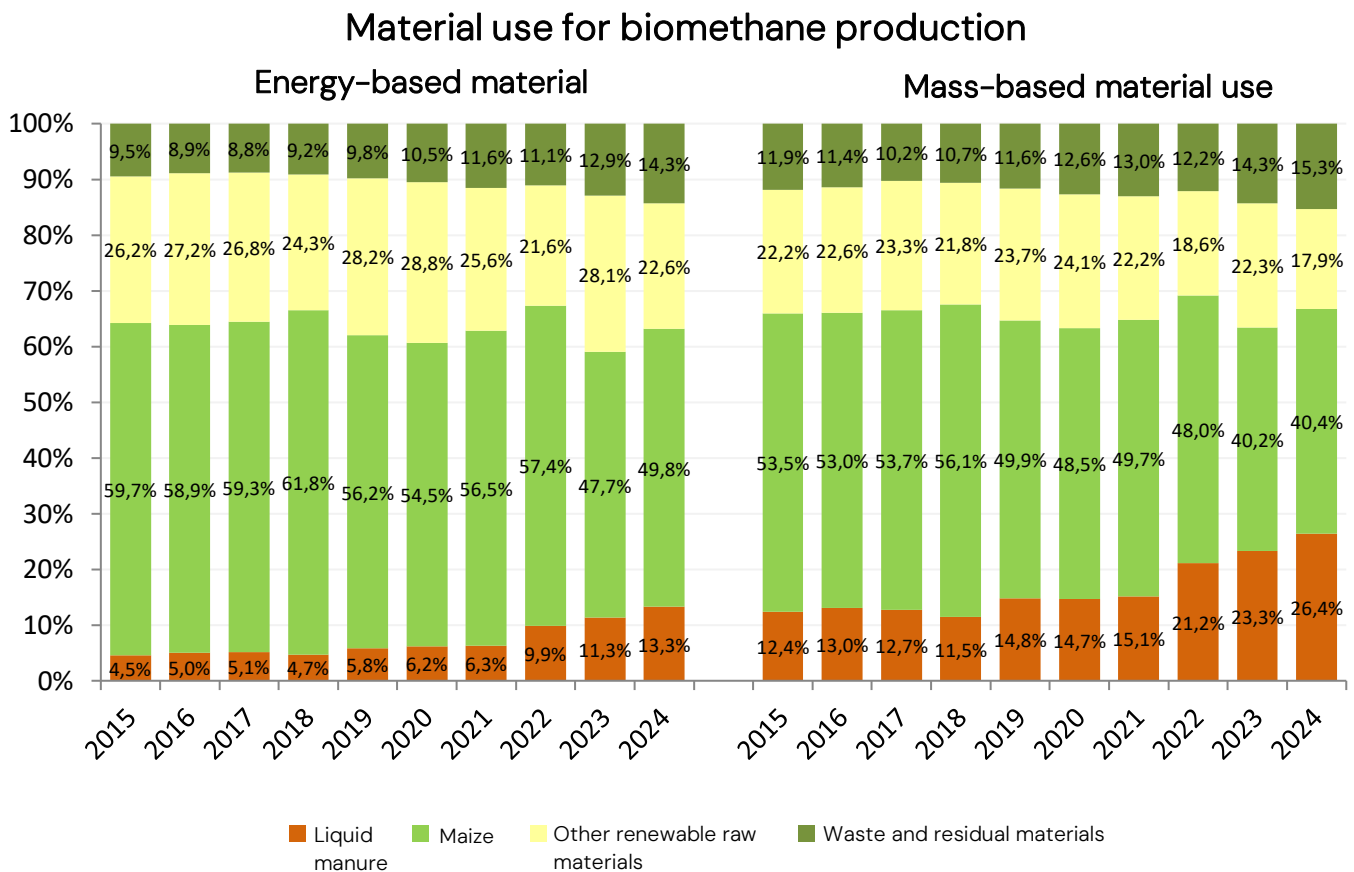


Figure 5: Mass- and energy-based material use for biomethane production 2015 – 2024 (n2022=191, n2023=192, n2024=189) (Source: own graphic, dena 2025)

5 Assessment of the general business situation in Germany and abroad

The current assessment of the business situation is at its most pessimistic since the survey began. The main reason for this is the price collapse in the fuel sector that has been underway since 2023, triggered by cases of fraud involving falsely declared biodiesel and upstream emission reduction (UER) projects. This led to the insolvency of Landwärme GmbH, Germany's largest biomethane trader, in autumn 2024. This was another major blow for the entire biomethane industry, after bmp greengas GmbH was only able to fulfil existing contracts in autumn 2023 under adjusted risk and timeline conditions as a result of the war in Ukraine and the subsequent market impacts. In many cases, the companies affected had to bear rising costs, make costly replacement purchases, or resort to fossil natural gas. The result was a loss of earnings or even the complete shutdown of power plants. In the short term, this led to rising biomethane prices for subsequent purchases and a loss of confidence in the security of supply on the market. These developments are having an ever greater impact on the renewable energy market, which remains the most important sales channel for biomethane, and have caused overall sales to fall significantly in recent years. Overall, there is currently little demand for long-term biomethane contracts, which in turn has a negative impact on the price level. The insolvencies have therefore not only caused considerable financial losses, but have also shaken trust in the biomethane market itself – trust which must now be painstakingly rebuilt.

In contrast, the business mood abroad remains positive. Ambitious expansion targets, a reliable investment environment and the continuing growth of international trade are creating favourable framework conditions for plant construction as well as for the production and trade of biomethane. The fact that the mood is no better is mainly due to the still unclear and extensive documentation requirements for imported biomethane, which make it difficult to conclude long-term supply contracts.

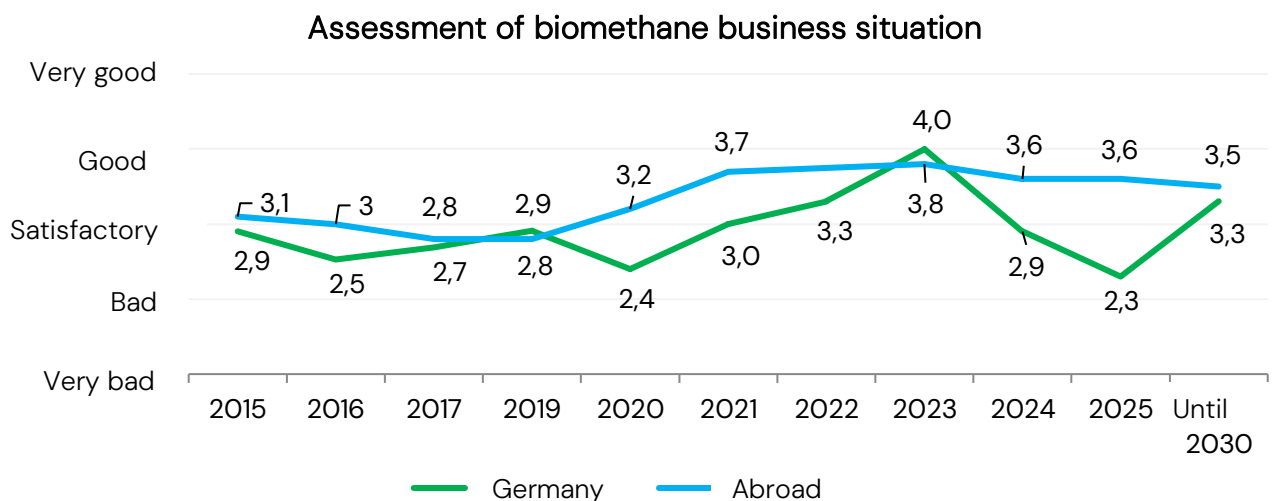


Figure 6: Assessment of the business situation from 2015 to 2025 and outlook (source: own graphic, dena 2025)

Outlook

Despite the predominantly negative developments in recent years, the longer-term outlook remains positive. With the support of its parent company, bmp greengas GmbH has now recovered from insolvency. The Landwärme contracts are partially financially secured and have been taken over by Anew Climate. Other affected players were also able to successfully restructure and are now looking to the future again. In addition, expectations of a recovery in quota prices in the fuel sector from 2026 onwards and an increase in demand due to the GEG in the coming years are cause for optimism. However, this confidence is dampened by the forecasts for 2027: once overfulfilment from previous years can once again be counted towards the GHG quota, a strong price-dampening effect can be expected. Nevertheless, recent market distortions also create opportunities: the increased buying and selling of plants observed over the past two years is continuing, and for some market players the current lower biomethane prices are making long-term contracts more attractive again.

Although the industry players surveyed expressed a strong desire for greater political support for the biomethane market, they do not expect it. In their view, the role of biomethane as a key pillar of the energy transition emphasised by market participants has not yet been sufficiently recognised by politicians. The uncertainty in connection with the Building Energy Act is viewed as particularly critical, as long-term planning certainty would be required here. The respondents see hope in the ongoing discussion about the introduction of a green gas quota and the implementation of RED III. In the long term, the use of biomethane could become a key driver, particularly in areas that cannot be electrified. One example of this is the EU Fuel Maritime Directive, which has already stimulated the first trading activities for biomethane in shipping.

6 Pricing and price development

The price development of biomethane is determined by a number of factors, some of which are difficult to predict. On the production side, increasing expenditure on operating resources and fertilisers has led to higher production costs in recent years. The main drivers were the Russian war of aggression against Ukraine, which drove up wholesale prices for natural gas, as well as high inflation in the wake of the coronavirus pandemic. While natural gas prices have now stabilised at a normal level, the production costs of biomethane remain at a high level. As a result, the price spread between natural gas and biomethane has widened again.

The high prices for GHG quotas in 2021 and 2022 led to an increased use of liquid manure in new and existing plants. However, this expansion was associated with considerable investment costs. In addition, biomethane production from liquid manure generally has higher specific production costs due to the comparatively low energy content, meaning that corresponding minimum revenues are required for the economic viability of these plants. However, quota prices in the fuel sector have been falling since 2023, making the economic use of biomethane in this segment more difficult in 2024. Although a price recovery is on the cards for 2025 and 2026, this has not yet led to an increase in the number of contracts concluded. Low gas sales in the transport sector remain a limiting factor: if the biomethane is not consumed, there is no tradable quota.

In the electricity sector with EEG subsidisation and fixed feed-in tariffs, production and procurement cost increases can hardly be passed on. There is only limited room for manoeuvre here in terms of heat revenues, but this is also limited due to the high cost pressure in the heating networks. When it comes to the use of biomethane in the heating market, for example in accordance with the GEG, little reliable price information is available to date as the sales volumes are negligible. Nevertheless, interest in this segment is growing significantly, meaning that a separate price category is likely to be established in the medium term.

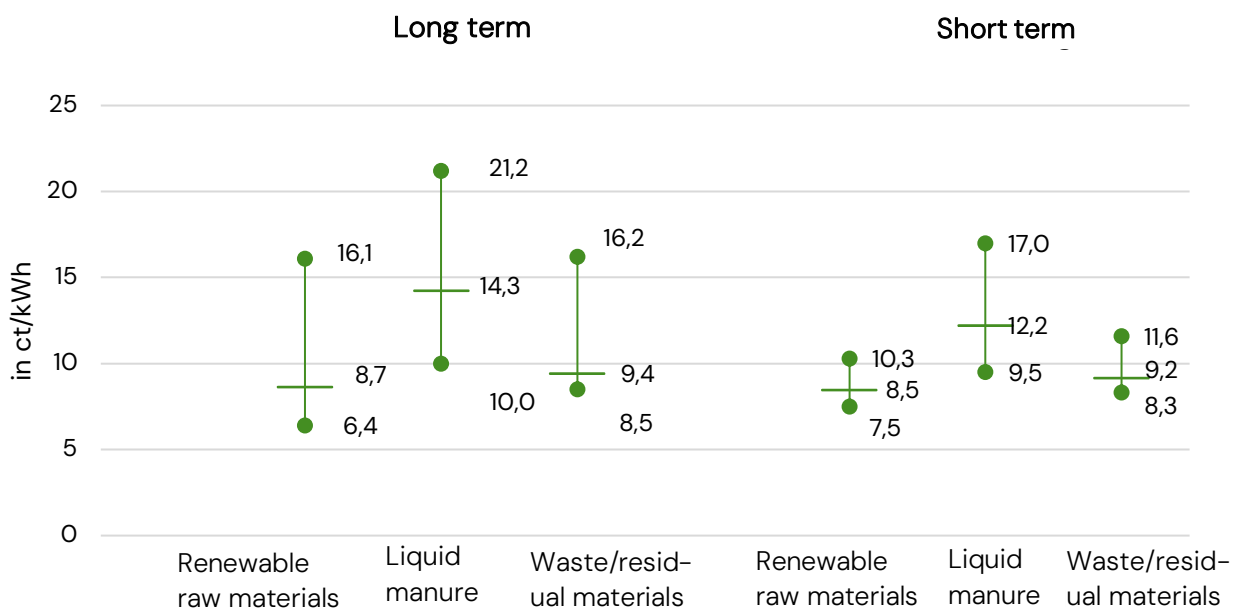


Figure 7: Average purchase prices in 2024 for biomethane by input materials for short-term and long-term procurement (Source: own graphic, dena 2025)

Prices fell in 2024 compared to the previous year, particularly for biomethane from liquid manure. In contrast, they remained largely stable for biomethane from renewable raw materials as well as for biomethane from waste and residual materials. The majority of respondents expected prices to fall further in 2025 – a trend that is already becoming apparent. For example, the price of biomethane from renewable raw materials has fallen below the 8 ct/kWh mark for the first time in a long time. Against the backdrop of the sustained rise in production costs, this has resulted in a difficult market situation. In addition, demand is currently low, which is putting additional pressure on prices. Contrary to expectations, the prices for liquid manure have stabilised slightly in 2025 and are currently around 11 ct/kWh.

Price development	2023 to 2024			2024 to 2025		
	Rising	Constant	Falling	Rising	Constant	Falling
Renewable raw materials (n=19)	7%	47%	47%	13%	40%	47%
Liquid manure (n=15)	0%	10%	90%	18%	18%	64%
Waste and residual materials (n=12)	0%	38%	63%	22%	33%	44%

Table 2: Development of biomethane prices compared to the previous year (source: own graphic, dena 2025)

International trade prices

International trade reveals a wide range of biomethane products and prices. Volumes based on waste and residual materials are in particularly high demand, as they command higher prices due to the high demand for offsetting in Switzerland – where biomethane from renewable raw materials is prohibited. There is also increasing demand for unsubsidised volumes. While imported biomethane is deemed acceptable in many scenarios, subsidised biomethane is repeatedly subject to discussions about over-subsidisation in terms of state aid law. Unsubsidised biomethane is therefore gaining in importance, as it can be offered to customers as a reliable, low-risk product in the long term.

Pricing is increasingly geared towards the target markets. Biomethane from renewable raw materials follows the prices in emissions trading (see section 7.4). Biomethane based on waste and residual materials, on the other hand, is sold in higher-priced markets such as Switzerland or, going forward, in the transport sector, particularly in shipping. The FuelEU Maritime requirements for the use of renewable fuels in shipping will create an additional demand segment that is likely to have a significant impact on price trends in the future.

Price range international trade

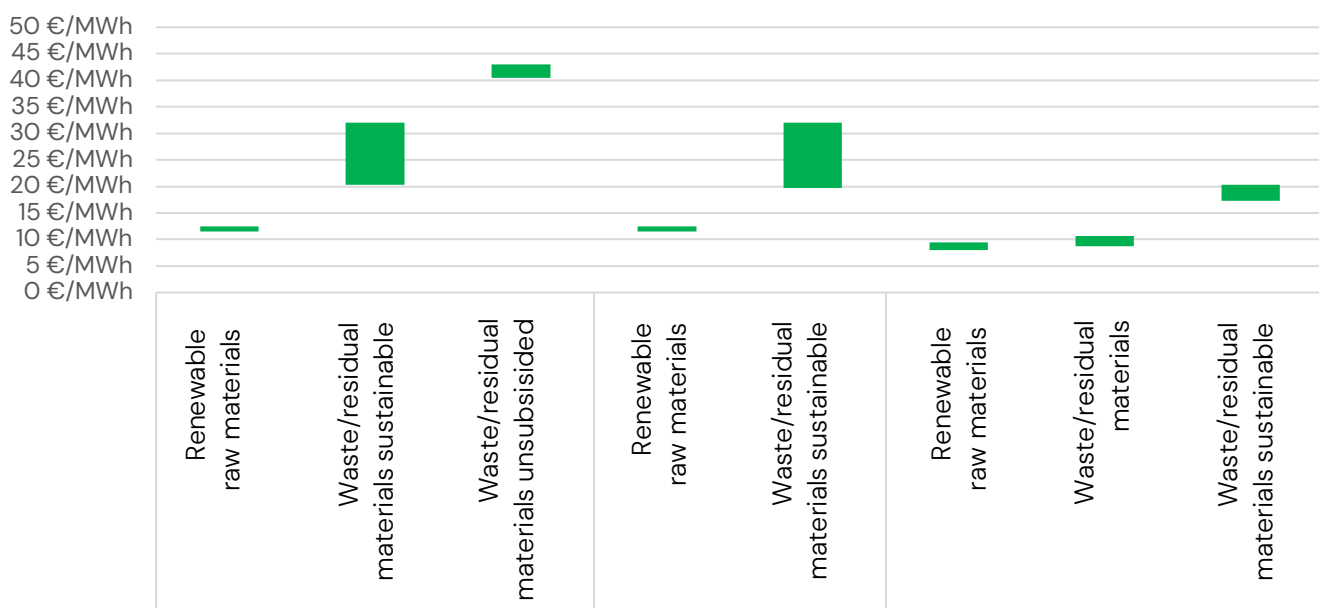


Figure 8: Price levels of international trade by country and product category (source: own graphic according to Argus Media, 2025)

7 Status quo and outlook for biomethane utilisation

Sales in the electricity sector, where up to 80 per cent of the biomethane produced in Germany was used in the past, are in sharp decline. Under the current framework conditions, there has been no significant increase in the number of combined heat and power (CHP) plants. On the contrary, a considerable number of existing plants are being taken off the grid – often as a direct result of supply shortfalls and insolvencies in recent years, which have caused numerous operators to lose their entitlement to EEG remuneration or to voluntarily give it up. In the future, some of these plants could be put back into operation, provided they are not already at the end of their EEG subsidy period.

In the heating sector, a decline was recorded for the first time after years of steady, albeit moderate, growth. It should be noted that at the time of the evaluation, not all certificates for heat applications in 2024 had yet been decommissioned. In addition, supply shortfalls due to the insolvency of Landwärme GmbH may have contributed to this decline. From 2029 at the latest, a significant increase in demand of several terawatt hours can be expected as a result of the provisions of the Building Energy Act (Gebäudeenergiegesetz, GEG). However, it is difficult to make reliable forecasts due to the federal government's current deliberations on a fundamental revision of the GEG.

The framework conditions for the greenhouse gas reduction quota (GHG quota) will be fixed until 2040 with the current amendment, resulting in a stable outlook for advanced biofuels such as biomethane. This could result in considerable additional demand, particularly in heavy goods transport and shipping – for example through the use of bio-LNG (liquefied natural gas).

The use of biomethane is also becoming increasingly important in other sectors. The EU Emissions Trading System (ETS I and II) and sustainability reporting as part of the EU Taxonomy and the CSRD are increasing the economic and regulatory attractiveness of biomethane as a climate-friendly alternative to natural gas. However, so far, only biomethane stocks that have already been subsidised have reaped the benefits. With trading prices of €40 to €50/MWh for internationally traded biomethane, biomethane produced in Germany can rarely be offered competitively on these markets at rates of €80 to €120/MWh.

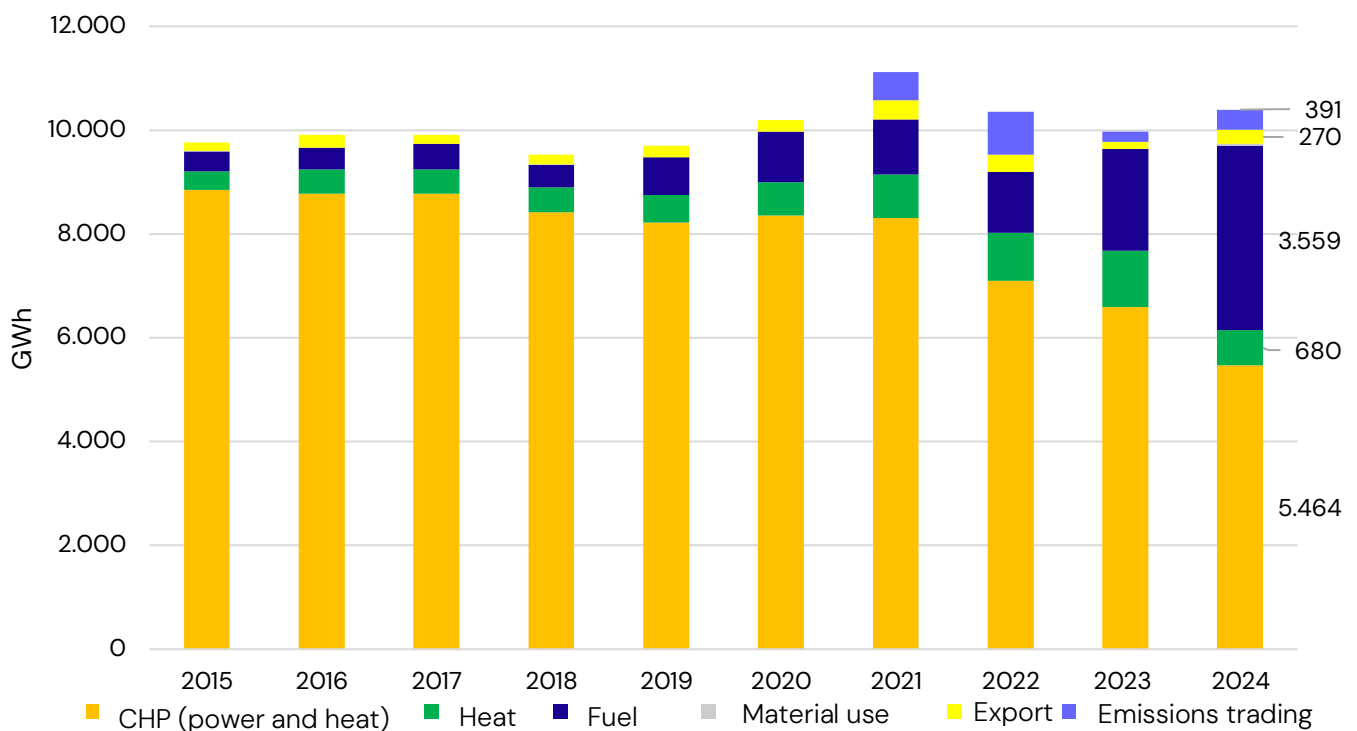


Figure 9: Time series for biomethane use by sector 2015 – 2024 (source: own graphic, dena 2025)

7.1 Biomethane in the electricity sector – limited appeal of incentive regulations in a challenging market situation

In light of the maximum bid value of 21.03 ct/kWh set for 2025, do you consider new projects to be economical?



Figure 10: Distribution of responses for economic viability of biomethane tender

No project was part of the tender rounds for biomethane funding in 2024 and 2025 either. Despite numerous amendments in recent years – most recently the so-called solar package at the end of 2024 – the expansion of highly flexible biomethane CHP units has failed to materialise.

Biomethane CHPs are to be subsidised under the EEG if they control their electricity generation in line with demand. They maintain reserve capacities and are only ramped up when necessary to compensate for short-term shortages in the electricity supply. The electricity prices on the spot markets generally serve as an indicator. In this way, they help to reduce the load on the electricity system and integrate volatile renewable energies. The subsidy provides targeted incentives for this form of flexible, system-friendly electricity generation and limits the maximum operating time to 876 full-load hours per year – around 10 per cent of the annual hours. In the past, however, this regulation only applied to the south of Germany, where there is a particularly high demand for flexible generation due to grid bottlenecks. In last year's survey, this regional restriction and the low maximum bid limit were identified as key obstacles to economically viable bids. With the solar package, the South German quota was abolished and the maximum bid limit was raised.

According to the survey, these amendments have significantly improved the initial situation, but they are still not enough. More than 70 per cent of those surveyed consider a further increase in the maximum bid limit or the flexibility surcharge to be necessary in order to ensure the projects' economic viability. The main problems here are the persistently high biomethane prices and the limited full-load hours of the plants. In addition, the long approval and planning times make project realisation considerably more difficult: a valid permit is mandatory for participation in tenders, and delays in this process are the biggest obstacle for around 80 per cent of respondents.

The German government is currently looking into establishing gas-fired power plants as a central pillar of supply security in Germany and is planning to rapidly expand controllable power plant capacities. The aim is to mitigate critical grid loads and increase the flexibility of the energy system. However, biomethane CHP plants have not yet been included in these plans. In the long term, they could even suffer from the price-dampening effects of these measures, as price peaks – which are crucial for the economic viability of these plants – would occur less frequently. The innovation tenders also involve similar challenges for renewable systems with storage facilities. In light of these framework conditions, no expansion of electricity generation from biomethane is to be expected in the short term. On the contrary, numerous existing plants are currently reaching the end of their twenty-year EEG subsidy period.

What obstacles to participation in the biomethane tender do you consider to be critical in 2025 as well?

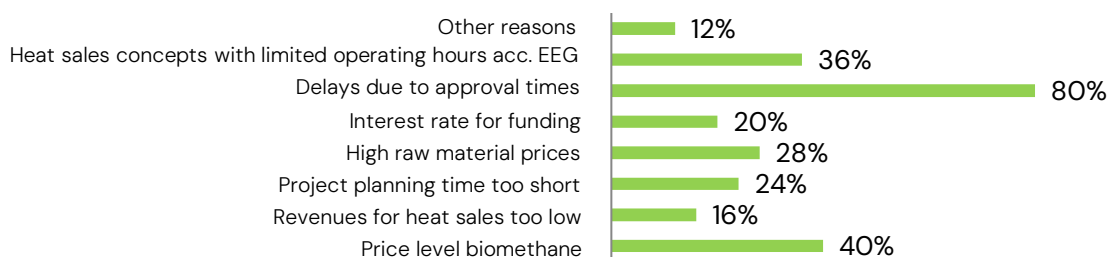


Figure 11: Obstacles in the context of the biomethane tender [multiple answers possible]

7.2 Biomethane in the heating market – GEG

A key source of hope for the industry is the rising demand predicted in the Building Energy Act (Gebäudeenergiegesetz, GEG). Current legal regulations continue to allow the installation of gas heating systems, provided they are operated with renewable gases such as biomethane or hydrogen in the future. This results in a theoretical sales potential of 13 to 45 TWh in 2040. (dena, 2024a) However, this potential is tied to certain prerequisites – in particular the rate of renovation and new construction, the future distribution of heat generators and the results of municipal heating planning. The latter may result in the decommissioning of individual sections of the natural gas grid and thus have a significant impact on market dynamics.

In the current survey, over 90 per cent of respondents stated that they had not yet noticed any increase in demand for biomethane as a result of the GEG. In any case, a noticeable increase is not expected until the deadlines for municipal heat planning have expired and the GEG obligations for all buildings come into force from 2029. A majority of respondents also emphasised that gas tariffs that comply with the GEG are currently hardly available; only two of the respondents had customers who purchase biomethane to meet the legal requirements. A recent analysis by Verivox came to the conclusion that only 42 of the 189 biogas tariffs listed meet the requirements of the GEG. (Verivox, 2025) At the same time, the additional costs of these tariffs compared to conventional gas offers are deemed to be critical. Against this backdrop, it remains to be seen how the biomethane market in the heating sector will develop in future. According to the Federal Association of the German Heating Industry (Bundesverband der Deutschen Heizungsindustrie, BDH), heating sales in the first quarter of 2025 were the lowest they have been in a decade; a decline in sales of heat generators had already been recorded in the previous year. At the same time, according to dena's building report, there is still a considerable need for modernisation: around 20 per cent of heating systems in Germany are more than 30 years old – predominantly the oldest generation of oil and gas heating systems. (dena, 2024b) The low modernisation rate is partly due to uncertainties surrounding the GEG and the accompanying subsidy programmes. For example, the sale of gas heating systems increased significantly before the law came into force in 2024 – out of concern that it would no longer be permitted to install them in future or that they would not be able to fulfil the requirements of the GEG. Gas-based heating systems currently still account for around 50 per cent of heat generator sales. As things stand, these will increasingly have to be fuelled with biomethane in the coming years. The introduction of the Emissions Trading System II (ETS II) could also favour the use of biomethane, as rising CO₂ prices increase its economic attractiveness (see chapter *Fuel Emissions Trading Act – BEHG*). At the same time, however, this leads to rising general gas tariffs.

In the coalition agreement of the 25th federal government (21st legislative period), there are also plans to revise the GEG again – or even abolish it, depending on how you interpret it. Important details on the promised openness to technology and the specific CO₂ reduction targets have yet to be finalised and could have a significant impact on the market strategy. Overall, the future sales potential of biomethane in the heating market remains closely tied to the regulatory framework, price trends and the expansion of additional production and import capacities.

Biomethane in the heating network

The district heating supply will play a central role in the decarbonisation of the heating market in the future. After oil and gas heating, it is already the third most common type of heating system in Germany. Around 18 per cent of the energy provided already comes from biomass – predominantly from solid biomass such as wood, wood pellets or wood chips. At the same time, biogas and biomethane are becoming increasingly important, especially in municipal and industrial heating networks. In the BMWK's (Federal Ministry for Economic Affairs and Climate Action) long-term scenarios for climate neutrality, biomass plays a rather subordinate role overall, as large heat pumps and hydrogen are envisaged as central pillars of the decarbonisation strategy. Nevertheless, the combination of large heat pumps and highly flexible biomethane CHP systems produces clear synergies – particularly with regard to a grid-friendly, resilient heating system. The Heat Planning and Decarbonisation of Heating Networks Act (Gesetz für die Wärmeplanung und zur Dekarbonisierung der Wärmenetze, WPG) has set ambitious targets: by 2030, at least 50 per cent of grid-based heat nationwide is to come from renewable energies or waste heat, with each individual

network having to achieve a share of at least 30 per cent. By 2045, the proportion of climate-neutral heat generated in the entire district heating network is to increase to at least 80 per cent; complete decarbonisation is even planned for some networks. The use of biomass in larger networks is limited to 25 per cent, while no restrictions apply to smaller networks with a pipeline length of up to 50 kilometres.

7.3 Biomethane in transport – amendment to the GHG quota as a hopeful sign

Until 2023, the fuel sector made a significant contribution to the biomethane industry's revenue due to exceptionally high quota prices – particularly as a result of the minimum quota for advanced biofuels. The existing incentive regulation primarily promoted the increased use of liquid manure in biomethane plants and led to a significant increase in grid connection requests for new or retrofitted plants. The attractive market situation subsequently triggered numerous investments in new capacities. However, with the drastic fall in prices in 2023, triggered by extensive cases of fraud involving falsely declared biodiesel volumes – particularly from China – many of the newly initiated projects ran into financial difficulties. In August 2024, the resulting market uncertainty led to the insolvency of Landwärme GmbH, Germany's largest biomethane and GHG quota trader, whose business model was highly dependent on stable quota prices. Due to the regulatory protection of legitimate expectations and the protracted investigation of the fraud cases, the quota price remained at a level below €150 per tonne of CO₂ equivalent for a relatively long period of time – a price that does not provide a sound economic basis for most biofuel projects.

Evolution of quota prices

The quota price for this period has risen again following the regulatory change, according to which overfulfilment from previous years may not be counted towards GHG quota fulfilment in 2025 and 2026. As fulfilment must now take place exclusively within the relevant year and the targets for the GHG quota continue to rise at the same time, the demand for quota fulfilment has increased in the short term. However, a negative side effect of this regulation was that quota trading almost came to a standstill towards the end of 2024: many obligated parties had already fulfilled their quotas early, which led to a further fall in prices during this period. From 2027, it will once again be possible to count overfulfilment from previous years towards the quota credit, which is expected to have a



Figure 12: Price development of GHG quota prices, penalties and required price level for new project development (Source: own graphic, dena 2025)

price-dampening effect. However, a well-founded assessment of this will only be possible with the publication of the 2024 quota statistics, when the actual level of overfulfilment will become known. The industry players participating in the survey emphasised that consistently higher quota prices are a basic prerequisite for the development of new projects. Whether such a price level will actually materialise remains to be seen in light of the regulatory uncertainties and market developments described above.

Adjustment of the GHG quota – RED III

As part of the implementation of the Renewable Energy Directive (RED III), a draft bill to adjust the GHG quota was presented in June 2025, which is due to come into force at the beginning of 2026 according to the German government's current schedule. In future, the GHG quota will be mandatory for all fuel suppliers and transport sectors. At the same time, the minimum quota for advanced biofuels will be raised: from 2026, it will be 2 per cent instead of the previous 1 per cent. With the abolition of the previous double counting, a higher actual energy input will be required in future to meet the quota. An automatic adjustment of the quota in the event of overfulfilment should also help to stabilise the quota market. The amendment also focuses on combating fraudulent imports and abolishing the crediting of so-called upstream emission reductions (UER), which were sometimes misused in the past. In the long term, the adjustments are expected to lead to a more stable price level and thus significantly improve planning and investment security for new plants. Depending on the development of the individual transport sectors, advanced biofuels could achieve an energy volume of 240 to 700 PJ (equivalent to around 66 to 200 TWh) in land transport alone in just a few years. (Naumann & Etzold, 2025) The use of biomethane is largely dependent on the further development of CNG and LNG mobility.

Development of CNG and LNG mobility

Biomethane is mainly used in the transport sector in the form of compressed biomethane (bio-CNG) or liquefied biomethane (bio-LNG). In the past, these fuels were mainly used in private cars and smaller CNG lorries, although their registration figures have declined in recent years. There is currently greater potential in the supply of heavy LNG lorries, CNG buses and in the refuelling of ships with bio-LNG – an area of application that is becoming increasingly important, particularly in the North Sea and Baltic Sea regions and also increasingly in inland shipping. A wide range of models is also available for agricultural vehicles such as tractors and working machines, although these have so far only been used to a limited extent in Germany.

While car traffic still accounts for the largest share of total traffic in Germany, gas mobility hardly plays a role in this segment. Falling registration figures and a shrinking petrol station network point to a continued decline. In medium and heavy road haulage, on the other hand, biomethane – especially in the form of bio-LNG – is an attractive option for reducing emissions. Their competitiveness currently depends heavily on financial incentives, such as tax breaks as part of the energy tax for natural gas (until 2026) or offsetting as part of the GHG quota, which allows for lower fuel prices at petrol stations. The number of gas-powered lorries and buses is currently increasing slightly, which indicates a growing, albeit limited, demand potential for biomethane as a pure fuel (see KBA registration figures and the DBFZ monitoring report "Renewable Energies in Transport").

However, the greatest source of hope for the use of biomethane is the shipping industry. With the amendment to the Federal Immission Control Act (Bundes-Immissionsschutzgesetz, BImSchG), this sector shall receive its own GHG quota and is thus increasingly moving into the focus of alternative fuels – which is also due to the European FuelEU Maritime Directive. Ocean-going and inland waterway vessels have the longest service life of all modes of transport, averaging over 30 and 50 years, respectively. Of the newbuilds ordered worldwide in 2024, 5.3 per cent will be equipped with LNG propulsion and a further 2.6 per cent with methanol propulsion. (Schröder & Görsch, 2025) This means that LNG is increasingly emerging as an alternative standard in shipping. Even if only a few ships sail under the German flag, this trend could give the biomethane industry a new boost in the context of the GHG quota. To meet the future increase in demand for bio-LNG, various projects are already underway that pursue different technical approaches – from liquefaction directly at the biogas plant to the liquefaction of biomethane

taken from the grid and "virtual" liquefaction processes using counter-nomination at LNG terminals, for example in Zeebrugge.

FuelEU Maritime Regulation

The FuelEU Maritime Regulation has been in force in the European Union since 1 January 2025. Similar to ReFuelEU Aviation in the aviation sector, it is intended to promote the increased use of renewable energies in shipping and reduce greenhouse gas emissions.

The central instrument of the regulation is a newly introduced GHG reduction quota that must be met by each individual ship. Emissions must be gradually reduced compared to a fossil reference value of 91.16 g CO₂eq/MJ (see Figure 4).

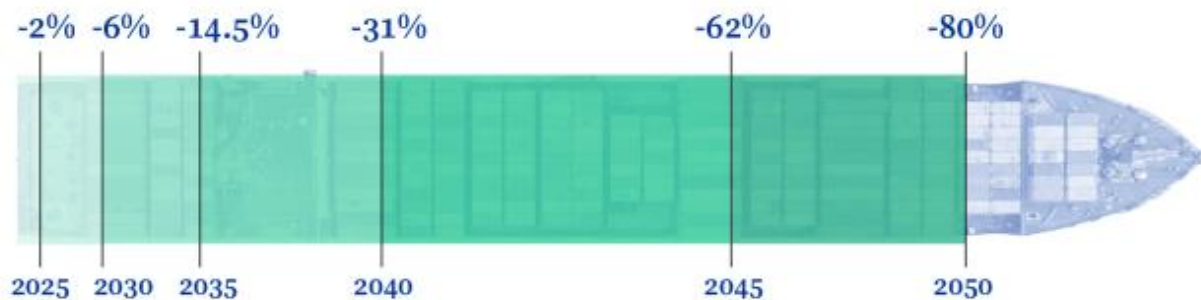


Figure 13: Reduction targets compared to 2020 (source: European Commission, 2025)

The use of RFNBOs, which can be credited with a multiplier of 2 up to and including 2033, is particularly encouraged. Compliance with the quota must be demonstrated for every ship with a gross tonnage (GT) of 5000 or more that calls at a port within the European Economic Area (EEA). If this obligation is not met, penalties of around €640 per tonne of CO₂ must be paid. In addition, shipping was incorporated into the European Emissions Trading System (EU ETS) at the beginning of 2024. As in other sectors, certificates must be purchased for the emissions produced. In 2025, 70 per cent of emissions must initially be taken into account, rising to 100 per cent from 2026. From 2026, methane and nitrous oxide emissions will also be included. Certified biofuels, RFNBO and RCF are counted as zero emissions. There are therefore two complementary incentives for the use of biomethane – via the FuelEU Maritime Regulation and via the EU ETS. In Sweden and Finland, the first loads are already being bunkered due to the increasing demand for bio-LNG, and plants for supplying bio-LNG for shipping and harbour operations are currently under construction. (Sawary-Kohnen, 2025)

Accounting for emissions in FuelEU Maritime and in the ETS

Emissions are taken into account differently in the FuelEU Maritime Regulation and in the EU ETS. A basic distinction is made between well-to-tank (WtT) and tank-to-wake (TtW) emissions. WtT emissions include the production, transport and supply of the fuel, while TtW emissions result from on-board combustion. Both WtT and TtW emissions are taken into account in FuelEU Maritime.

The actual, certified emission values are used for the WtT emissions; either certified or standard values can be used for the TtW emissions. Methane and nitrous oxide emissions are also included in the balance. In contrast, only TtW emissions are taken into account in the EU ETS. RED-certified fuels are generally counted as zero emissions.

7.4 Emissions trading and reporting

Emissions trading and emissions reporting are already an important driver for imported biomethane. Rising CO₂ prices reduce the price difference between natural gas and biomethane and, in some cases, close it completely for biomethane volumes that have already been subsidised. This is making the use of biomethane economically attractive in some applications and may produce a pull effect that should not be underestimated if prices continue to rise, as large gas consumers in particular form the central market for biomethane in ETS I. The Fuel Emissions Trading Act (Brennstoffemissionshandelsgesetz, BEHG) and the introduction of ETS II will also increase demand in

the future. Although prices in ETS II are likely to remain at a lower level initially, they are expected to rise significantly in the long term. This will have a noticeable impact on both natural gas and biomethane sales. With inelastic demand for gas, biomethane will inevitably become more of a focus for procurement as CO₂ prices continue to rise. This also applies to measures such as the use of biomethane as part of the Building Energy Act (Gebäudeenergiegesetz, GEG) and the efforts of companies subject to reporting requirements in connection with the EU Taxonomy and the Corporate Sustainability Reporting Directive (CSRD). However, it is currently difficult to predict how companies' willingness to pay for such products will evolve in the future.

In what areas do you see the demand for international certificates rising particularly strongly?

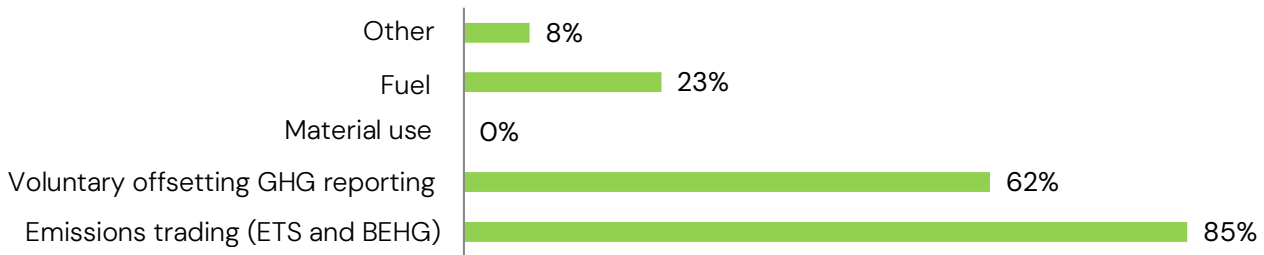


Figure 14: Demand drivers of international trade 1

Do you see additional demand for biomethane in the following areas even though gas prices have fallen again compared to previous years?

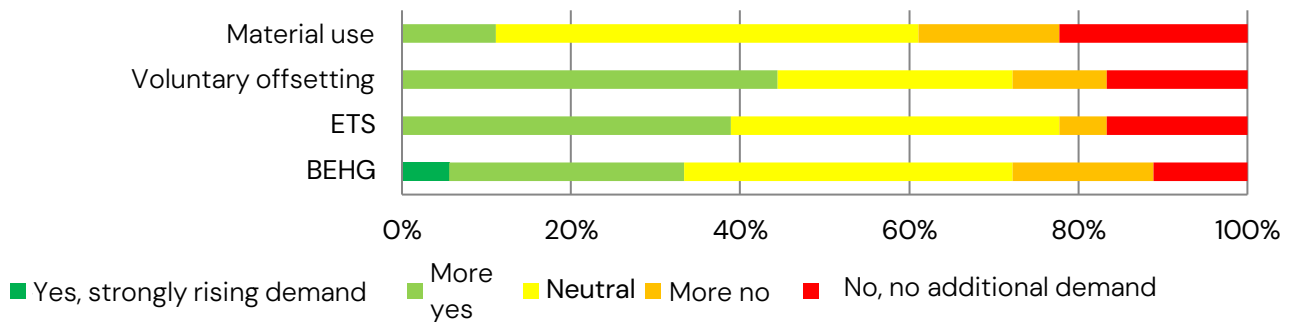


Figure 15: Demand drivers of international trade 2

Biomethane in ETS I

Biomethane is in particularly high demand in Germany and Europe as part of the EU ETS I. This is primarily due to the fact that biomethane – provided that it fulfils the sustainability and GHG requirements – is given an emission factor of zero and companies can fully offset their direct CO₂ emissions in EU emissions trading. According to agriportance and Argus Media, the current price level on the international biomethane market for the quality required by the ETS is usually between €10 and €15/MWh for spot and short-term supply contracts. This proves to be attractive and competitive compared to the cost of EU ETS certificates, the price level of which in 2025 was around €55 to €60 /t CO₂eq (which corresponds to around €16/MWh CO₂ mitigation costs for biomethane). Biomethane therefore offers companies an economical alternative to the traditional purchase of emissions certificates, particularly in energy-intensive industries that are subject to more extensive sustainability reporting or that are pursuing ambitious CO₂ reduction targets. The use of biomethane is therefore a strategic tool – especially for large plant operators and industrial companies that want to improve their carbon footprint in a market-based manner and, at the same time, gain investment security. The combination of price attractiveness, regulatory recognition and the predictable reduction in operational emissions has significantly accelerated the import of European-

certified biomethane to Germany in recent years. However, it should be noted that the required quality at the required prices is only available to a limited extent. Bulk buyers, in particular, quickly reach the limits of the achievable purchasing volume.

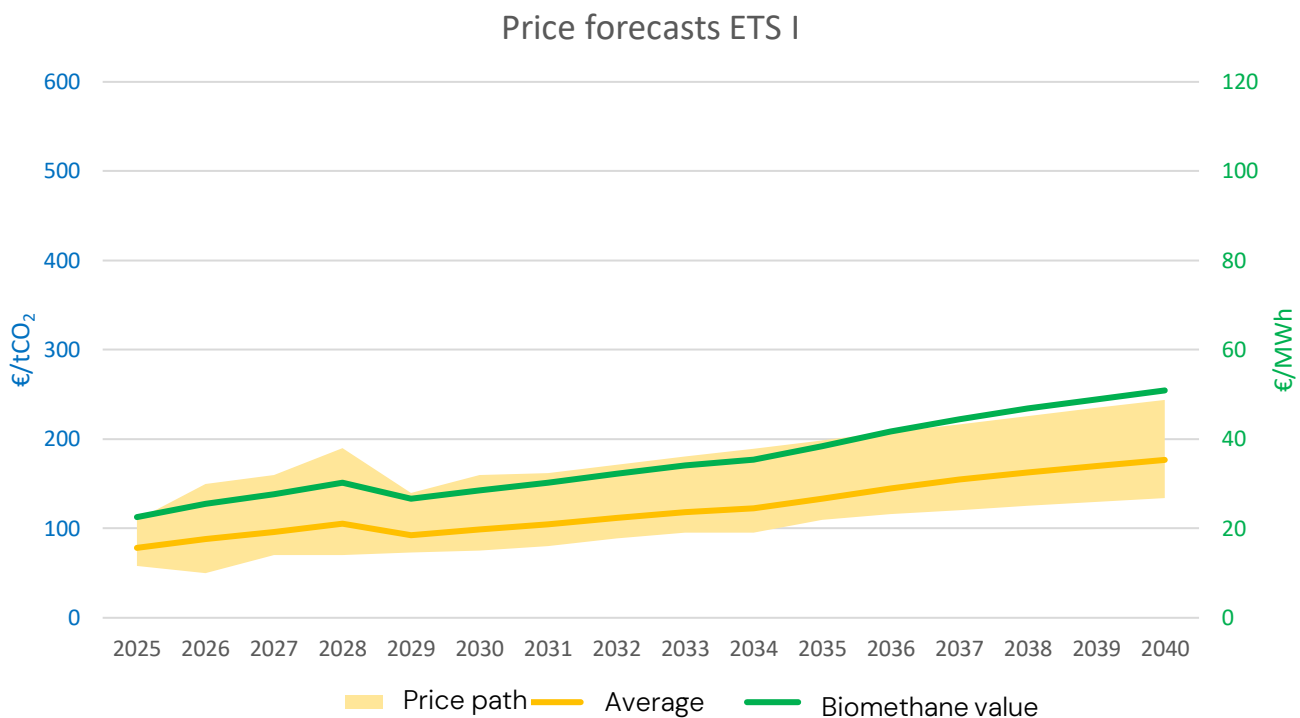


Figure 16: Price development ETS I forecast and equivalent biomethane value until 2040 (Source: own graphic according to Enerdata, 2025; Ariadne, 2022; Carbon Market Watch, 2025; Müller & Sacco, 2025)

Biomethane in BEHG/ETS II

The EU ETS II (European Emissions Trading System 2) is a new, independent emissions trading system that will be introduced in addition to the existing EU ETS I. In future, it will include the buildings and road transport sectors, which were not previously included in EU ETS I, as well as other specific sectors. In Germany, these sectors are already covered by the Fuel Emissions Trading Act (Brennstoffemissionshandelsgesetz, BEHG), which is to be replaced by the EU ETS II from 2027 or 2028. A fixed price or price corridor was set for the first few years under the BEHG. From 2027, the price is to be freely determined by supply and demand on the market – similar to ETS I. At €35 to €65 per tonne of CO₂, the price in the introductory phase was not yet at a level that made the use of biomethane economically attractive, but it was already helping to reduce the cost difference between natural gas and biomethane. Accordingly, the BEHG has not been the decisive driver of biomethane demand to date. However, as ETS II is starting without free certificates and with a stricter supply cap, it can be assumed that prices will rise more quickly than in ETS I. According to forecasts by the Potsdam Institute for Climate Impact Research (Potsdam-Institut für Klimafolgenforschung, PIK), the price could exceed the €100 mark as early as 2028, creating a cost advantage of around €20 per MWh over more emission-intensive alternatives.

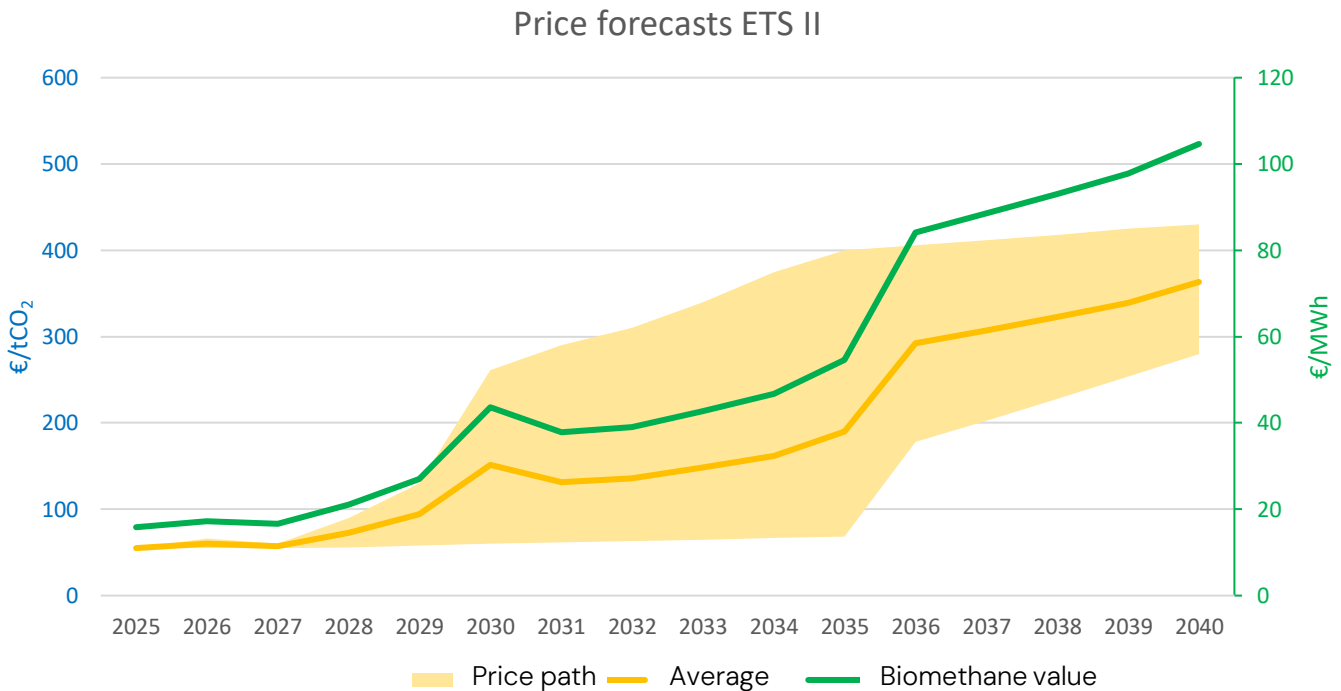


Figure 17: Price development ETS II forecast and equivalent biomethane value until 2040 (Source: own graphic according to PIK, 2025; EPICO Klimainnovation, 2025; BloombergNEF, 2025)

Voluntary compensation and emissions reporting

In addition to the ETS, reducing emissions is now a key driver for the use of biomethane as a substitute for natural gas. The EU Taxonomy and the Corporate Sustainability Reporting Directive (CSRD) form the legal framework for larger European companies, some of which are obliged to report on the sustainability of their business activities. The GHG Protocol and the VSME Standard serve as a basis for small and medium-sized enterprises and for voluntary sustainability reports. However, the regulations on the use of biomethane have not yet been sufficiently clarified or standardised, meaning that its use remains subject to certain uncertainties. (dena, 2025)

Biogenic CO₂

CO₂ from biogenic sources – such as biogas plants, bioenergy production or industrial biomass processes – is becoming increasingly important as a sustainable raw material for material use and as a carbon carrier in the hydrogen economy. The demand for biogenic CO₂ is likely to increase significantly in the coming years, particularly as a result of efforts to defossilise industry, the emergence of a hydrogen economy and the possible creditability of CO₂ capture towards the GHG value of biomethane.

7.5 International trade

Intra-European trade in biomethane has been growing steadily for years. Not only is demand increasing – for example in Germany, Switzerland and the Netherlands – but supply is also expanding. Driven by growing demand and investment efforts at European level, supported by the REPowerEU plan among others, the first feed-in projects are being implemented in numerous countries. At the same time, established biomethane markets such as France are also opening up more to international trade due to European regulations.

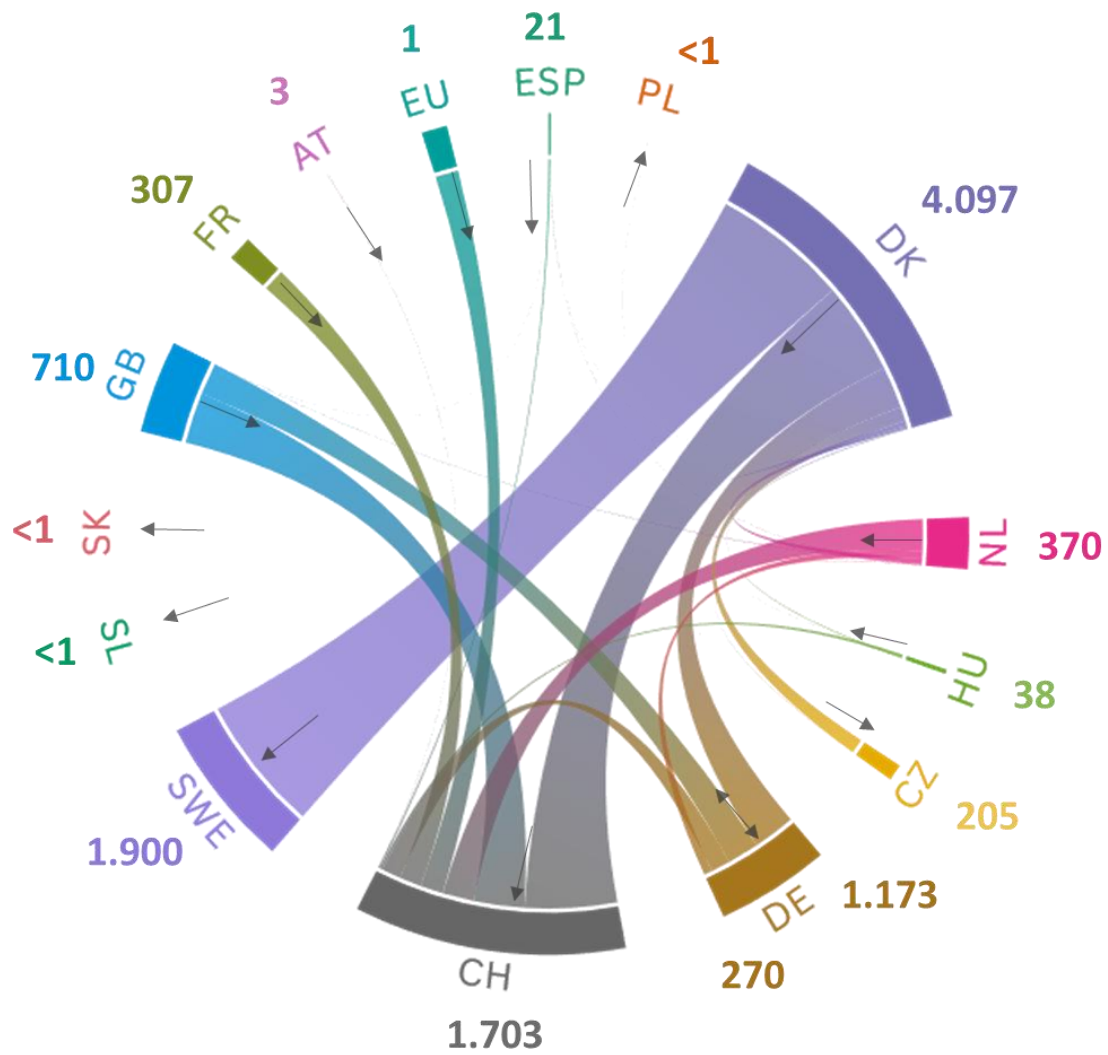


Figure 18: National trade in biomethane in 2025 (in GWh) (source: own graphic, dena 2025)

According to the third EBA Investment Outlook from June 2025, the investment volume in biomethane production currently amounts to around €28 billion. By 2030, around 7.3 billion cubic metres of biomethane are to be fed into the European grid. Investments are primarily focused on established production countries such as Denmark, the United Kingdom and France. At the same time, many "newcomer" countries are also starting to invest massively in expansion – above all Spain, which could become the second largest biomethane producer in Europe after Denmark by 2030 if the planned projects are fully implemented.

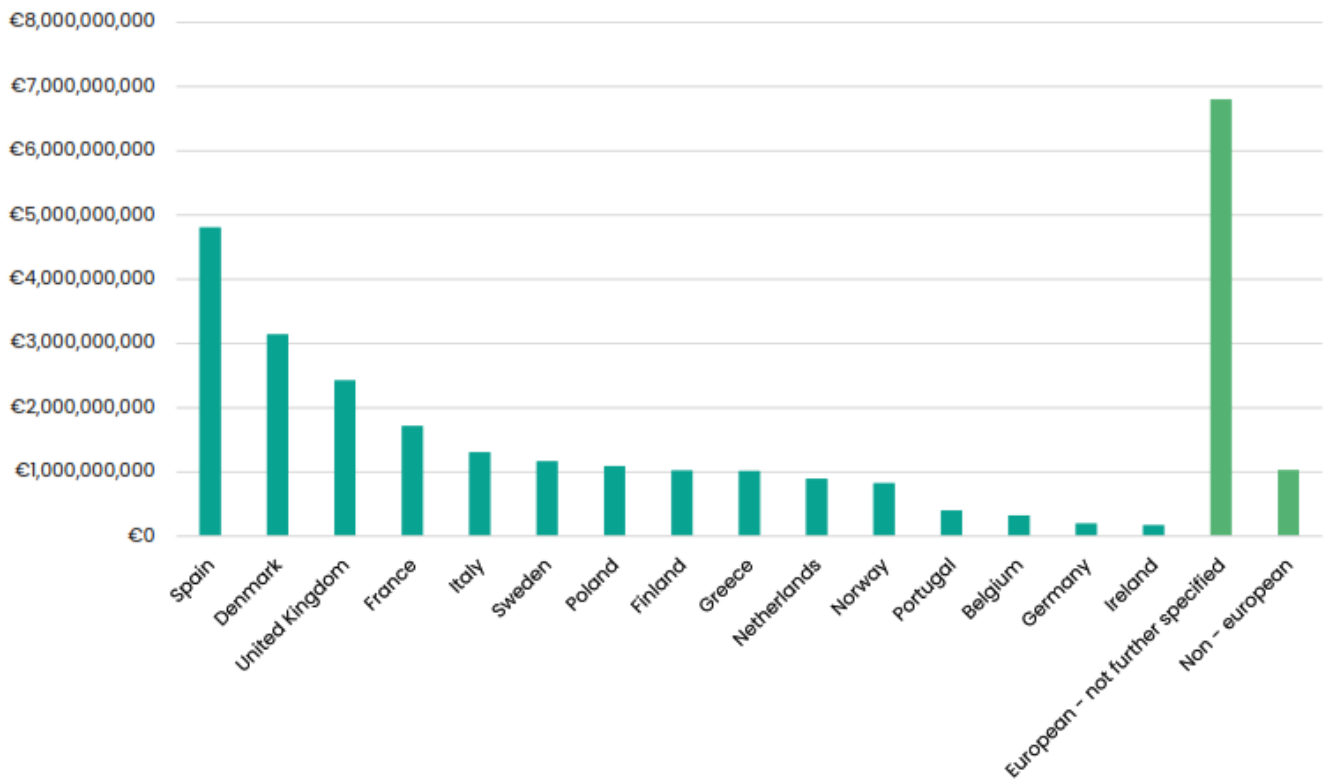


Figure 19: Distribution of investment volumes by country according to EBA Biomethane Investment Outlook

United Kingdom

Around 5 TWh of biomethane is currently produced in the UK every year. The country has been an export nation for this renewable gas for years and makes an important contribution to the European biomethane trade. The positive development of the sector is largely due to effective state support mechanisms. The Renewable Heat Incentive (RHI) programme formed the basis for investments for many years by guaranteeing long-term feed-in tariffs for renewable gases. In addition, biomethane certificates could be traded nationally and internationally via the Green Gas Support Scheme (GGSS).

The RHI has since been replaced by the Green Gas Levy – a levy on gas deliveries. In addition, the inclusion of biomethane in national emissions trading is currently being discussed, which could further increase feed-in volumes in the UK. National biomethane production is expected to increase to around 50 TWh per year by 2030.

Spain

Spain has announced that it will massively drive forward the expansion of biogas and, in particular, biomethane plants in order to diversify its energy supply, achieve its climate targets and empower rural regions. This new expansion is closely linked to the European REPowerEU initiative, which envisages the production of 35 billion cubic metres of biomethane across Europe by 2030 in order to reduce gas dependency on Russia and drive forward the decarbonisation of the energy system. Many of the planned projects are supported by the InvestEU plan and other EU funding programmes. (Europäische Investitionsbank, 2024)

A target of 20 TWh per year by 2030 has been set for biomethane in the national climate and energy plan (PNIEC) – an increase of 10 TWh compared to the previous target. Only a few plants are still in operation, but numerous projects are already being planned or are under construction. Spain is considered to be a particularly attractive market for biomethane production due to the large quantities of agricultural and industrial by-products. The Spanish Gas Association estimates the technical potential at up to 163 TWh per year (Deutsche Handelskammer für Spanien, 2024). According to estimates from the European National Energy and Climate Plans (NECP), Spain could

cover around 13 per cent of Europe's gas demand by 2030 (Europäische Kommission, 2025). Around 50 projects with a total capacity of around 3.5 TWh have currently been announced or are already being implemented. The plants are primarily intended to serve the domestic market, but some of the companies involved are already active in cross-border trade. It is therefore likely that Spanish biomethane volumes will also be traded internationally in the future.

Netherlands

The Netherlands was one of the first countries to trade biomethane internationally. Back in the 2010s, volumes were imported to Germany from the Netherlands and used to fulfil Baden-Württemberg's Renewable Heat Act (EWärmeG). After Denmark, the Netherlands is currently the second largest exporter of biomethane in Europe – but this could change from 2027. On 1 January 2027, the Netherlands will introduce a blending obligation for green gas ("Bijmengverplichting"), which also includes biomethane. This measure is similar to the green gas quota being discussed in Germany and replaces the current system of gas feed-in tariffs with a quota market. Energy suppliers are thus obliged to gradually add increasing proportions of biomethane to their natural gas supplies. The aim is to feed around 1.1 billion cubic metres of biomethane into the Dutch gas grid every year by 2030. The current feed-in volume is around 0.3 billion cubic metres or around 3 TWh. The national production target for 2030 is 20 TWh, which is well above the amount required to fulfil the blending obligation. Biomethane volumes from other European countries can also be explicitly counted towards the target, which could lead to the development of a new import market. Originally, the Dutch government wanted to exclude this possibility, but refrained from doing so following a warning from the European Commission to safeguard the internal market. All biomethane quantities that fulfil the sustainability and greenhouse gas reduction requirements of the RED are eligible. (Overheid, 2024)

Ireland, Romania, Slovakia, Czechia

New to the list of production countries for international biomethane trade are **Slovakia, Romania, Ireland** and **Czechia**. **Slovakia** is massively promoting the expansion of renewable energies with a particular focus on the construction of biogas and biomethane plants and the conversion of existing plants to biomethane. Ten biomethane projects are currently being planned (SAPI, 2024) and the first plant has been feeding biomethane into the natural gas grid (EnviTec Biogas, 2025) since June 2025.

In **Romania**, the national energy strategy also provides for a targeted expansion of biomethane production. By 2030, five per cent and, by 2050, ten per cent of the national demand for natural gas is to be covered by biomethane. Current demand is around 100 TWh, but is likely to increase further due to the planned construction of new gas-fired power plants (Ernst, 2024). However, as there are currently hardly any subsidy programmes for plant construction, it is uncertain whether these goals will be achieved. The first-generation plant is already being planned and is due to go into operation within the next two years. (Black Sea Oil & Gas, 2025)

In **Ireland**, around 75 GWh of biomethane is currently produced per year in two generation plants – still well below the national target of 5.7 TWh by 2030. Since 2025, however, the Renewable Heat Obligation (RHO) has been part of the Support Scheme for Renewable Heat (SSRH). The RHO obliges energy suppliers to provide a proportion of renewable energy, with biomethane playing a central role. The utilisation of imported biomethane volumes is also possible in principle. In order to keep domestic production competitive with imports, Irish biomethane is valued with a multiplier of 1.5. Imported biomethane would therefore have to be around 30 per cent cheaper to be competitive. Another large-scale plant is already being planned by an Irish investment group; around 1.8 TWh of biomethane is to be produced by 2030 (Greengate Biogas, 2025).

In **Czechia**, the first biomethane plant went into operation in 2022, followed by the second in 2025. With four new plants planned, the pace of expansion has now increased noticeably. This development is being driven by the announced introduction of a feed-in tariff for biomethane as part of the Biomethane Action Plan (Ministerstvo životního prostředí, 2025) and the creation of the so-called GO+, a guarantee of origin that also contains relevant sustainability information. The first quantities have already been traded internationally via this new register (OTE, 2025).

France

Biomethane production in France has been expanding steadily since 2015. The basis for this is a state-guaranteed tariff for biomethane ("tarif d'achat"), which can be up to €120/MWh depending on the size of the plant, substrates used and other factors. In the current year, France has replaced Germany as the country with the largest biomethane production capacity. Despite the strong growth, French biomethane has not yet been available for international trade. Previously, export was only possible via so-called ex-domain cancellations of guarantees of origin, as direct transfer of guarantees of origin between different registers was not previously envisaged. However, this will change in future as a result of the RED requirements. The European Energy Exchange (EEX), as the new register operator, has already initiated this process. This obstacle was largely removed when operation of the register of guarantees of origin was reassigned to EEX in 2023. This enabled international trade and the conclusion of long-term contracts for the first time. For example, Engie – the largest biomethane producer in France – and BASF have concluded a seven-year supply contract for biomethane for material use. (ENGIE, 2024)

Italy

Italy is already one of Europe's established biomethane markets and is likely to continue to play a leading role in the future. Numerous announced investment projects envisage the construction of more than ten new plants. At the same time, the expansion of the grid infrastructure for connecting biomethane plants is being subsidised by the European Investment Bank with more than €200 million. National biomethane production is to be increased to around 50 TWh by 2030.

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