GAS UND WASSERSTOFF WIRTSCHAFT

THE GERMAN GAS AND HYDROGEN INDUSTRY

Gas Review 2025

Natural Gas, Hydrogen and Biogas in Germany

Why Natural Gas Is Important for Germany

26.9 %

of Germany's primary energy consumption is accounted for by natural gas

44.4 %

of the energy used in industry is supplied by gases

56.2 %

of homes are heated with natural gas

Contents

Gas as a Structural Pillar of Germany's Energy System

German Energy Market Stabilises in 2025

Germany's energy market remained broadly stable in 2025. Following the severe disruptions triggered by the 2022 energy crisis, market conditions continued to normalise. Primary energy consumption increased marginally by 0.1 percent to 2,931 TWh.

Compared to the pre-crisis year 2021, overall energy consumption remains approximately 15 percent lower. This reflects sustained efficiency gains, structural adjustments in industry and households, and continued economic weakness.

Gas and Renewables Continue to Displace Coal

Although total primary energy demand has largely stabilised, supply and demand are increasingly operating within a new equilibrium. Diversified import routes, new sourcing structures and structurally lower demand have strengthened market resilience. Energy nevertheless remains a significant cost factor for households and businesses — albeit without the extreme price volatility observed during the crisis years.

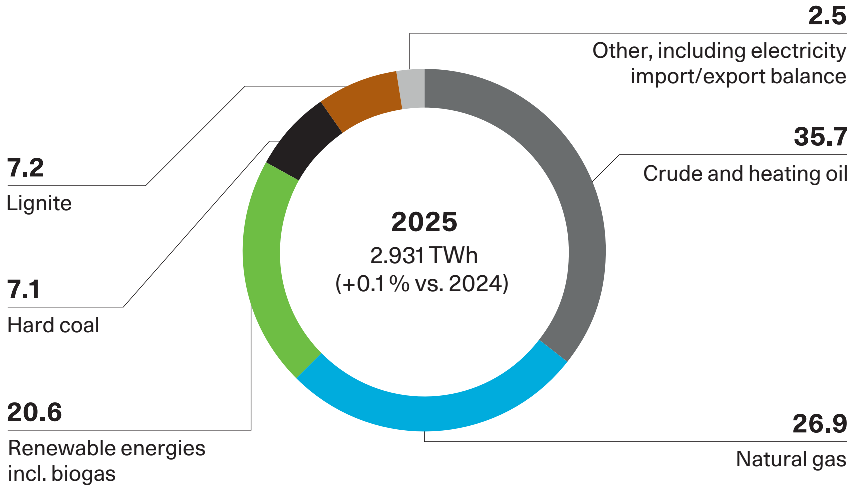
Within the energy mix, developments differ by energy carrier. The share of natural gas in primary energy consumption rose by around one percentage point to 26.9 percent in 2025. Gas therefore expanded more strongly than renewables, whose share increased by 0.7 percentage points. Alongside renewables, natural gas remains a central component of Germany's energy system.

This trend is consistent with longterm structural change. Over the past three decades, gases and renewable energy sources have steadily expanded their share of total energy consumption, while hard coal and lignite have declined significantly. The gradual substitution of coal has been a key driver of Germany's greenhouse gas reductions.

Gas Consumption Increases Across Most Sectors

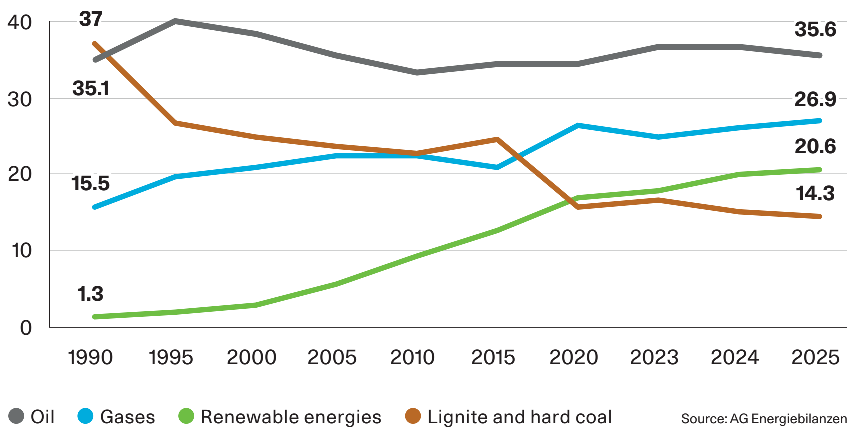
Emission trends since 1990 underline this development. The energy sector, industry and buildings have achieved substantial emission reductions, supported by efficiency improvements, fuel switching from coal to gas, and the growing integration of renewable energy sources. By contrast, emissions in transport and agriculture have largely stagnated, with limited structural progress to date.

Primary Energy Consumption in Germany 2025
in percent



Source: AG Energiebilanzen

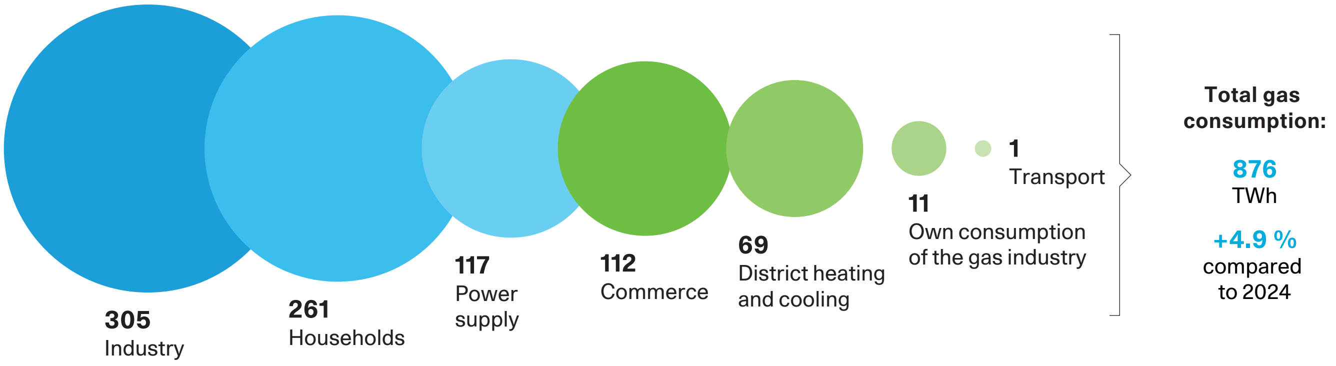
Development of Primary Energy Consumption 1990 - 2025
in percent



Source: AG Energiebilanzen

Gas Consumption by Customer Groups 2025

in TWh



Source: BDEW

Following the sharp demand reductions during the crisis years, gas consumption in Germany increased again in 2025 by approximately 5 percent, reaching 876 TWh.

Industry remains the largest consumer of gas, accounting for 305 TWh. Households represent the second-largest segment (261 TWh), followed by power generation (117 TWh), commerce and services (112 TWh), and heat and cooling supply (69 TWh). The gas sector's own consumption and transport account for comparatively small shares.

Growth was observed across nearly all customer groups. Particularly strong increases were recorded in commerce and services (+17.9 percent), district heating supply (+11.3 percent), and power generation (+10.4 percent). Industrial demand and household consumption also rose compared to the previous year.

This development indicates that both companies and households have returned to natural gas following the exceptionally high price levels of 2022 and 2023. Lower wholesale prices, improved supply security and the operational flexibility of gas-based applications have strengthened its attractiveness.

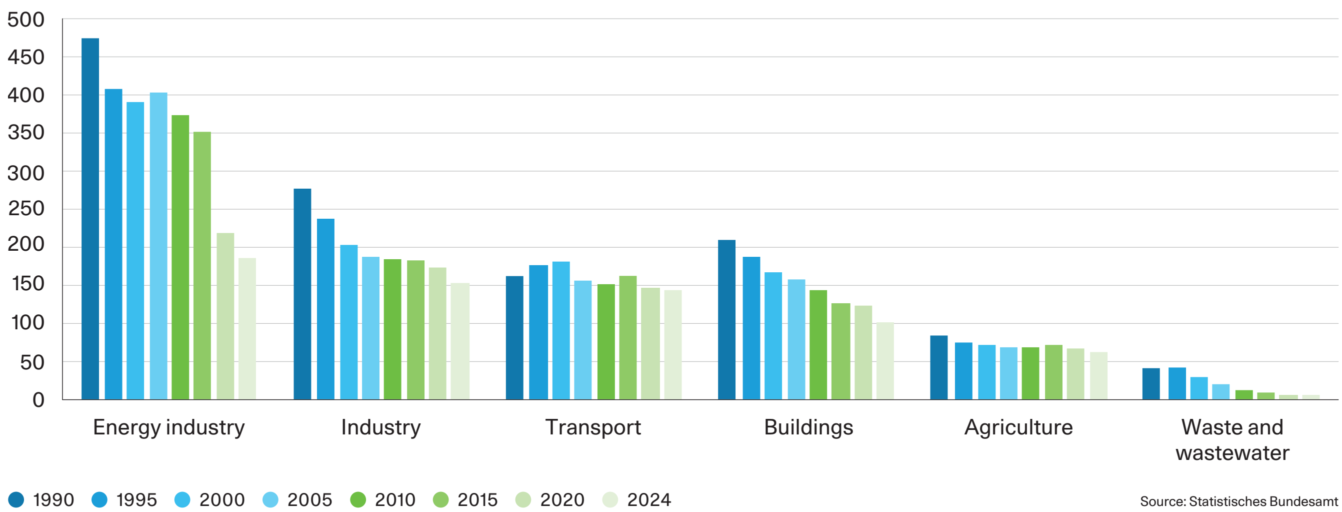
Weather conditions also played a role. Although average annual temperatures were higher than in the previous year, cooler periods during the course of 2025 contributed to higher consumption compared to 2024.

Natural gas continues to play a central role within Germany's energy architecture. As a flexible energy carrier, it contributes to security of supply across industry, commerce, households and electricity generation.

In particular, gas-fired generation provides balancing capacity during periods of low renewable output. At the same time, the continued use of natural gas has enabled a further reduction in coal-fired power generation, thereby making a measurable contribution to lowering energy-related greenhouse gas emissions.

Greenhouse Gas Emissions 1990 - 2024

in million tonnes of CO_2 equivalents



Source: Statistisches Bundesamt

European Gas Market Prices Stabilise – Structural Uncertainties Persist

Prices Remain Within a Moderate Corridor

Following the extreme volatility of the crisis years, European gas market prices have stabilised considerably. Since the acute phase of the 2022 energy crisis subsided, prices have fluctuated within a comparatively narrow corridor.

Over the past two years, benchmark prices at the Dutch TTF hub have largely ranged between €30 and €50 per megawatt hour (MWh) — significantly below the crisis-induced peaks. Market volatility has declined markedly. While short-term fluctuations continue, the extraordinary price spikes observed in 2022 have not reoccurred.

The current price environment reflects a rebalancing of global gas markets after the supply shock of 2022. Moderated demand levels and diversified import structures have eased supply constraints and contributed to more stable pricing dynamics. The calmer wholesale environment is increasingly visible in end-consumer tariffs. At the beginning of 2026, many suppliers reduced their gas prices, particularly in the basic supply segment. On average, households signing new contracts now pay approximately 19 percent less than at the beginning of 2025.

An additional relief effect results from the abolition of the gas storage levy as of 1 January 2026. The levy had been introduced during the energy crisis to ensure adequate storage filling levels.

The national CO_2 price under Germany's emissions trading system continues to have a comparatively limited impact on final gas prices. In 2025, the carbon price stood at €55 per tonne of CO_2. For 2026, legislation foresees an auction-based mechanism with a price corridor between €55 and €65 per tonne.
Even if the carbon price were to reach the upper end of this range, the

Natural gas price predominantly between

30 – 50

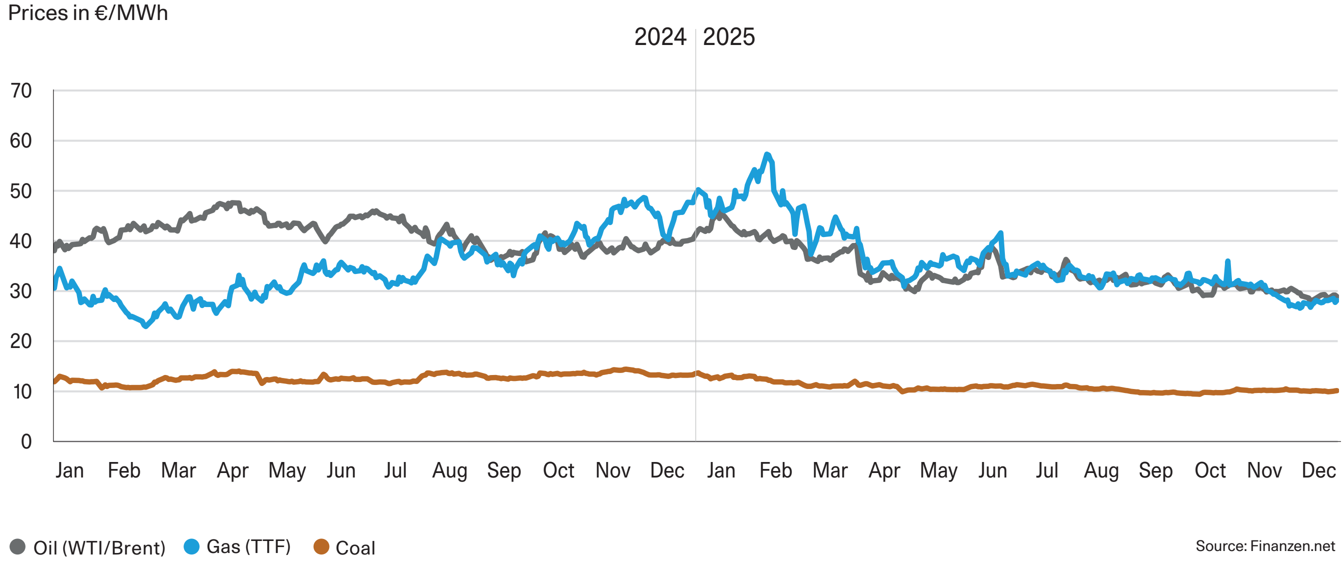
euros per megawatt hour

impact on household gas prices would amount to a maximum of around 0.2 euro cents per kilowatt hour (kWh). This is because a carbon price of €55 per tonne is already embedded in current tariffs, corresponding to roughly 0.11 euro cents per kWh (gross).

Despite current stability, gas price levels remain exposed to external influences. Geopolitical developments, structurally rising carbon prices and increasing network charges may affect future price trajectories. Continued diversification of supply sources and further expansion of LNG import infrastructure therefore remain essential to maintaining price stability and strengthening market resilience.

Development of Wholesale Prices 2024 - 2025

Prices in €/MWh



Source: Finanzen.net

New Supply Routes Strengthen Europe’s Gas Security

The US Leads in LNG Imports, Norway Dominates Pipeline Imports

The European gas supply system is more integrated than ever. Cross-border trade, closely interconnected transmission systems and largely harmonised market prices ensure that supply and demand interact across Europe in real time. A purely national assessment of security of supply is therefore insufficient — what matters is the resilience of Europe’s overall import and infrastructure architecture.

In 2025, Norway and the United States remained the EU’s key gas suppliers. Norway continues to be Europe’s most important pipeline supplier and represents a stable and reliable pillar of supply. At the same time, the United States has established itself as a major LNG exporter, securing a substantial share of short-term available gas imports.

Overall, Europe’s gas supply is now considerably more diversified than prior to Russia’s war of aggression against Ukraine. Pipeline gas from multiple origin countries is complemented by a growing global LNG supply.

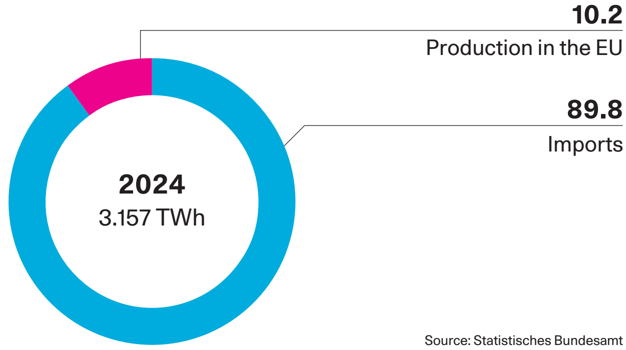
In addition to Norway, Europe continues to receive pipeline deliveries via corridors from North Africa, the Caspian region and South-Eastern Europe. Together with LNG imports, this mix of supply routes contributes to a broader and more resilient supply structure compared to the pre-war period.

At the same time, the United States is placing greater emphasis on LNG exports within its broader energy and industrial policy framework. The predominantly spot-market-based trade in US LNG increases flexibility but also introduces new dependencies and price risks.

Price comparisons illustrate structural differences between markets: the average Henry Hub spot price in

Gas Consumption in the EU

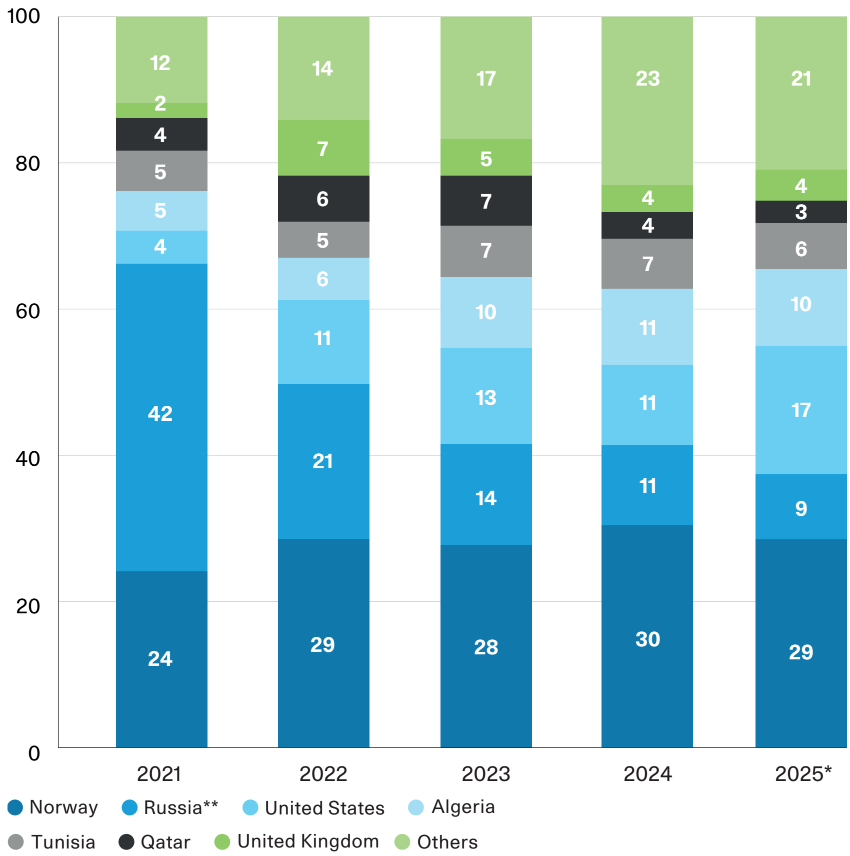
in percent



Source: Statistisches Bundesamt

Development of EU Natural Gas Imports 2021 - 2025*

in percent



*Preliminary data up to and including October 2025 **The Russian share includes import volumes from Belarus Source: Eurostat the United States stood at approximately €11 per MWh in 2025, significantly below the European TTF corridor of around €30–50 per MWh.

Global Liquefaction Capacity Is Expanding Significantly

LNG cargoes can be redirected to other regions when price conditions are more attractive. Moreover, export approvals and energy policy decisions are increasingly discussed as strategic instruments. Against this backdrop, continued diversification of supply sources remains essential — both through additional supplier countries and through a stronger use of long-term contracts.

The geopolitical dimension of these developments became more apparent in 2025. Relations with the United States have noticeably deteriorated under President Donald Trump; current political debates — including those concerning Greenland, Venezuela and Iran — underline that energy policy reliability cannot be viewed independently of geopolitical interests. For Europe, it is therefore essential to avoid new dependencies and to further broaden and diversify its import architecture.

Gas Storage and LNG Infrastructure Remain Crucial for Security of Supply

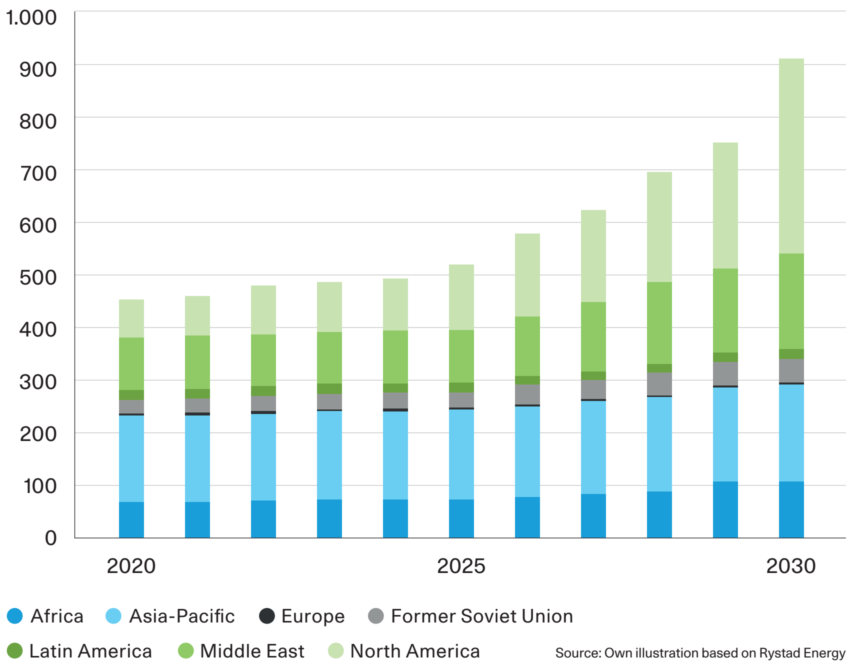
A key driver of current market developments is the expansion of global LNG liquefaction capacity. By 2030, global capacity is expected to nearly double compared to 2020 — from around 450 million tonnes per year to more than 900 million tonnes. New projects in North America, the Middle East and Africa are increasing available supply and intensifying competition among exporters.Pipelinekorridoren.

For the European Union, this expansion creates opportunities: greater available volumes and a broader range of supplier countries may exert downward pressure on prices and enhance security of supply. At the same time, structural import dependency remains high. In 2024, EU gas consumption amounted to approximately 3,157 TWh, of which around 90 percent had to be imported. Only about 10 percent was covered by domestic production. The continued decline in European gas production underlines that diversification and resilience will remain central energy policy priorities in the long term.

Gas flows to Germany in 2025 indicate an overall stable supply situa-

Development of Global Liquefaction Capacities 2020 - 2030

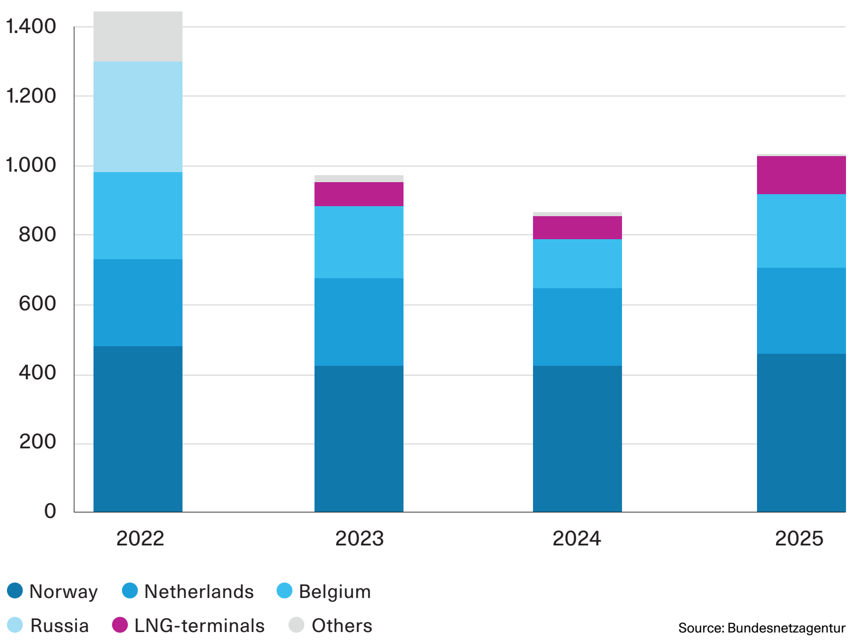
in million tonnes per year



Source: Own illustration based on Rystad Energy

Origin of Gas Flows to Germany 2022 - 2025

in TWh

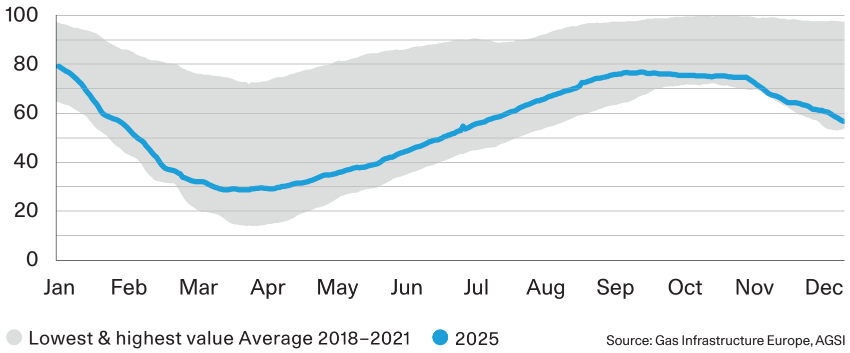


Source: Bundesnetzagentur

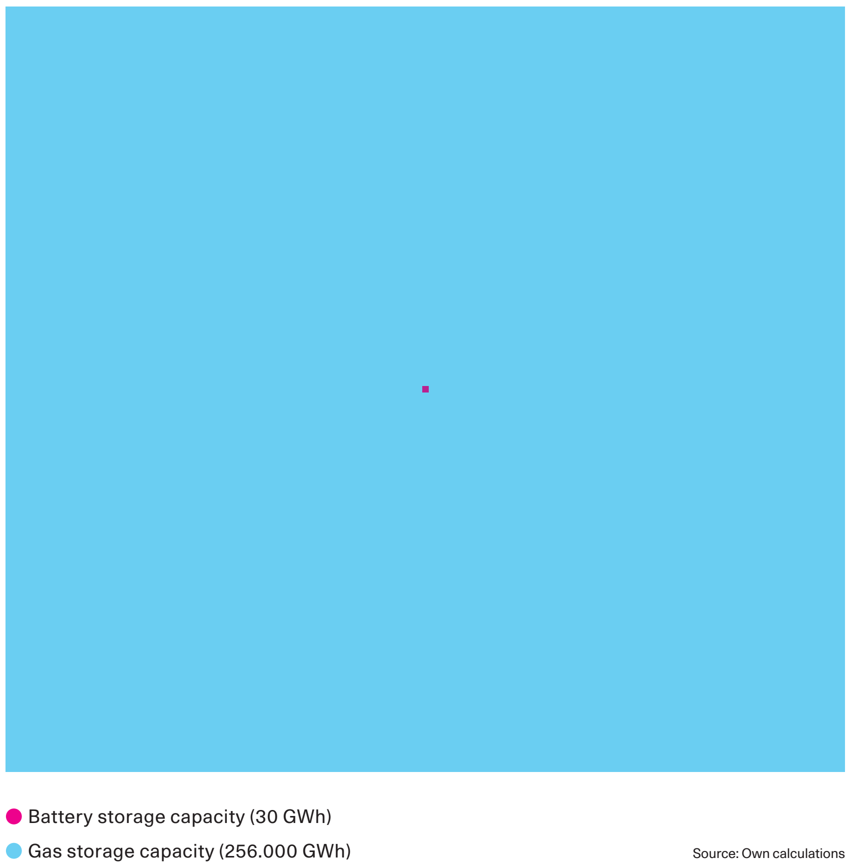
tion. Norway continues to dominate German imports, accounting for roughly 44 percent. In total, approximately 1,031 TWh of natural gas were imported into Germany in 2025 — significantly less than the more than 1,400 TWh recorded in 2022. Following the cessation of Russian deliveries, Germany now functions less as a European gas transit hub and more as a final consumer market.

German LNG terminals continue to play a central role in safeguarding supply security. They act as a strategic insurance mechanism for the energy system. In 2025, more than 100,000 GWh of LNG were landed in Germany for the first time — an increase of around 54 percent compared to the previous year. The terminals therefore strengthen diversification of supply routes and reduce dependence on individual pipeline corridors.

Gas Storage Levels in Germany
in percent



Gas and Battery Storage in Germany 2025
10,000 pixels, 1 pixel = 25.6 GWh



Independently of LNG infrastructure, German gas storage facilities remain a key stabilising factor. With a working gas volume of approximately 256,000 GWh, they can store energy not only for hours or days but for several months. This enables temporal decoupling of procurement and consumption, mitigates peak demand during cold periods, and provides strategic reserves in the event of import disruptions or infrastructure failures. Seasonal storage capability is therefore indispensable for maintaining security of supply.

At the same time, storage filling levels are facing increasing structural challenges. Due to higher LNG imports, the European market has become more flexible, which reduces the winter-summer price spread. When additional volumes are available at short notice via LNG, the seasonal premium for winter deliveries declines.

As a result, the traditional storage business model is weakening: injecting gas in summer and withdrawing it in winter is less economically attractive if price differentials no longer reliably cover storage, transport and financing costs.

Historically, gas was stored during summer months and withdrawn during winter. This seasonal pattern is becoming less predictable. As the current storage filling requirements expire at the end of 2027, the regulatory framework will become increasingly important. Clear policy guidance and an adjusted regulatory approach will be required to ensure reliable storage filling and long-term security of supply.

Security of Supply in the Power Sector: Gas Remains Indispensable

German Electricity Generation Increases Slightly

In 2025, approximately 509 TWh of electricity were generated in Germany. This represents an increase of 1.7 percent compared to the previous year. Overall generation therefore remains at a stable level. At the same time, a longer-term perspective shows that electricity demand in Germany remains below levels seen in earlier years.

In its 2025 energy transition monitoring report, the Federal Government revised downward its projections for gross electricity consumption through 2045. While the expected increase in demand is reaffirmed, the overall level is now assessed more cautiously. This adjustment reflects uncertainty regarding the pace of electrification in transport and buildings, as well as future industrial electricity demand. For 2035, projected consumption is now estimated at between 700 and 800 TWh.

Renewable energy sources accounted for approximately 56 percent of electricity generation in 2025, an increase of 0.3 percentage points. The limited change is largely attributable to weather conditions: wind generation was weak during the first half of the year, constraining overall renewable growth. By contrast, photovoltaic generation increased significantly, reaching a share of 17.6 percent (+2.6 percentage points compared to the previous year).

Installed renewable capacity also expanded further. According to the Federal Network Agency, 16.4 GW of photovoltaic capacity, 4.6 GW of onshore wind and 0.3 GW of offshore wind were newly installed in 2025. The year confirms a structural trend: on an annual average basis, the electricity mix is becoming increasingly renewable. However, availability continues to fluctuate significantly across weeks and seasons. This has important implications for system design: variability in renewable generation must be balanced by system flexibility and sufficient firm capacity.

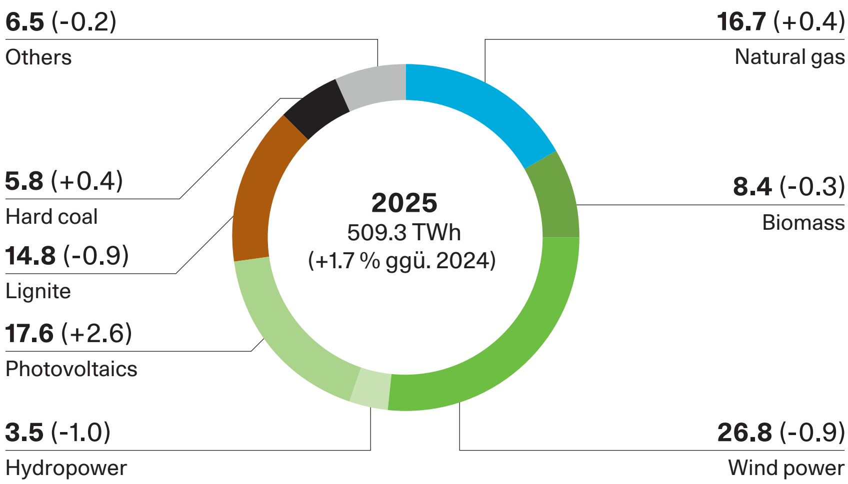
Even with the large-scale expansion of renewable generation and comparatively low generation costs, declining electricity prices are not guaranteed. The decisive factor is overall system cost.

Electricity Prices Remain Elevated — System Costs Drive End-User Prices

Transmission and distribution grids require extensive expansion and mo-

Gross Electricity Generation by Energy Source

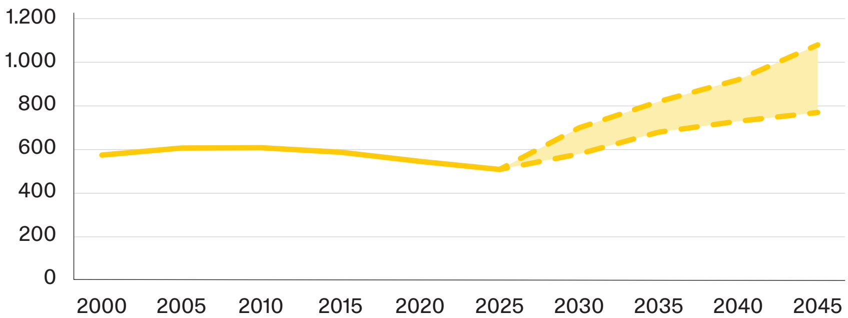
in percent (change in percentage points compared to the previous year)



Source: AG Energiebilanzen

Development of Gross Electricity Consumption in Germany since 2000 and projection until 2045*

in TWh

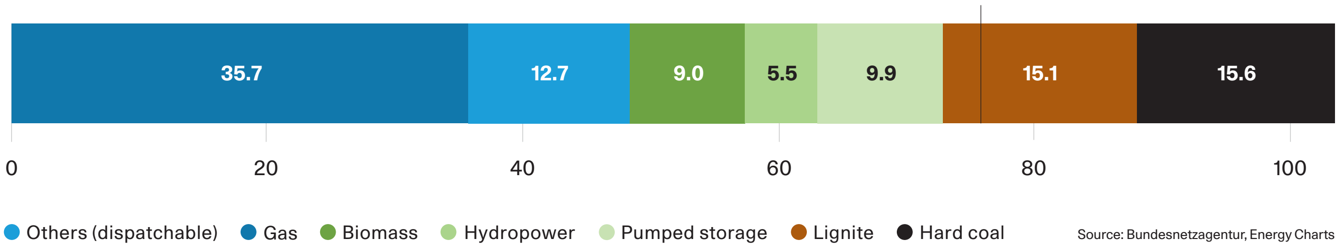


* according to the Federal Government's Energy Transition Monitoring 20255

Source: Own illustration based on the Federal Statistical Office and the Institute of Energy Economics at the University of Cologne (EWI)

Installed Dispatchable Capacity 2024

in GW



Source: Bundesnetzagentur, Energy Charts

dernisation. Storage facilities, control systems and connection infrastructure must also be developed further. These investments are reflected in network charges and levies and therefore directly influence end-user prices — irrespective of the marginal cost of renewable generation.

Electricity also remains scarce during critical hours. As coal capacity is phased out, the availability of firm capacity declines. In scarcity situations, dispatchable power plants continue to set the price — currently often gas-fired plants, and increasingly in the future hydrogen-ready power generation assets. While state relief measures may mitigate cost burdens, fiscal constraints limit their scope. Electricity prices are therefore likely to remain comparatively high and subject to uncertainty for the foreseeable future.

Coal Phase-Out Increases Demand for Firm Capacity

Natural gas further reinforced its importance in the power sector in 2025. Gas-fired electricity generation increased by around 4 percent. Gas therefore contributes not only to energy supply but, crucially, to system stability. Gas-fired power plants can be deployed at short notice and provide capacity when wind and solar output is low due to weather conditions. Compared to lignite-fired generation, gas-fired power plants also have a carbon footprint that is approximately 65 percent lower.

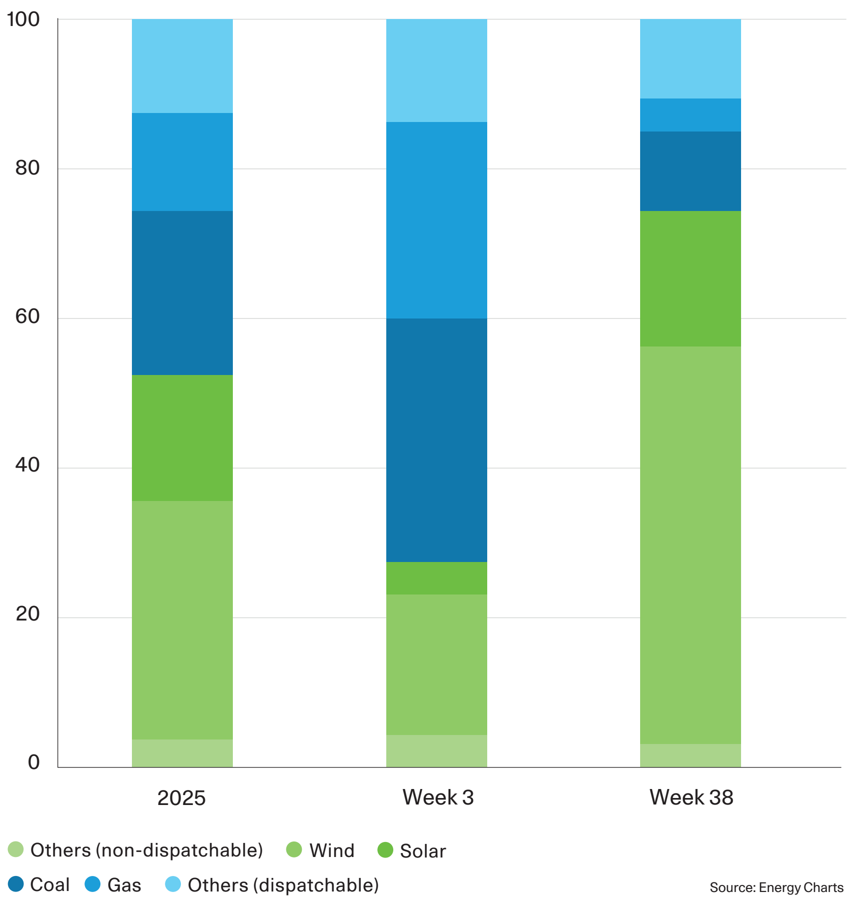
The importance of dispatchable generation becomes particularly evident during so-called “Dunkelflauten” — periods of low wind and solar output. While wind and solar together supplied around 52 percent of electricity generation on an annual average basis in 2025, there were periods with significantly lower feed-in levels. In calendar week 3, for example, approximately 72 percent of electricity generation had to be covered by dispatchable capacities such as coal- and gas-fired plants.

By contrast, in calendar week 38, around 74 percent of generation was supplied by non-dispatchable sources such as wind and solar. For security of supply, the decisive factor is therefore not installed nominal capacity, but the volume of firm capacity that can actually be delivered during critical hours.

Additional pressure arises from the ongoing coal phase-out. In the medium term, more than 30 GW of firm

Comparison of Net Electricity Generation 2025 with Selected Calendar Weeks

in percent



Source: Energy Charts

generation capacity will be withdrawn from the system in Germany. The Federal Network Agency's 2025 monitoring report on security of supply also highlights the need for additional dispatchable capacity to ensure long-term system adequacy. Against this backdrop, the Federal Government's announced power plant strategy must be translated swiftly into concrete tenders and bankable projects.

At the same time, load dynamics are changing. Peak demand reached 75.8 GW on 14 January 2025. With further electrification in transport and heating, higher peak loads can be expected in the future. This increases the importance of flexible firm capacity, as well as the effective interaction between grid expansion, storage and demand-side flexibility.

Moderate CO_2 Performance in International Comparison

Developments in the power sector directly affect climate performance. During periods of low renewable output, the remaining fossil generation mix determines the carbon intensity of electricity. Coal-fired power generation significantly worsens the emissions balance. Lignite- and hard coal-fired power plants emit approximately 1,120 and 860 grams of CO_2 per kilowatt hour respectively, whereas modern gas-fired plants emit around 392 grams of CO_2 per kilowatt hour.

The lower emissions profile of gas-fired plants results from both a lower carbon content of the fuel and higher efficiency. Modern gas plants can achieve efficiencies of up to 57 percent, compared to approximately 43 percent for hard coal and 39 percent for lignite.

In international comparison, Germany's electricity carbon intensity remains relatively high. Differences between countries reflect not only the pace of renewable deployment but also structural differences in generation portfolios. In some countries, nuclear power continues to play a significant role; in others, combined heat and power (CHP) has a stronger position, or coal capacity was replaced earlier by gas-fired generation — the United Kingdom being a prominent example.

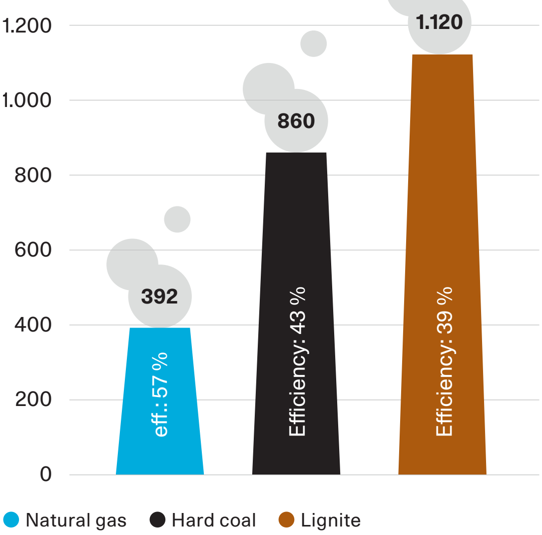
For Germany, this implies that accelerated renewable expansion remains essential. At the same time, additional modern and hydrogen-ready gas-fired power plants will be a crucial building block to replace coal capacity, secure supply during low-renewable periods and improve the carbon performance of the power mix.

344 g CO_2

per kWh was the carbon intensity of Germany's electricity mix in 2024.

CO_2 Emission Factors of Electricity Generation

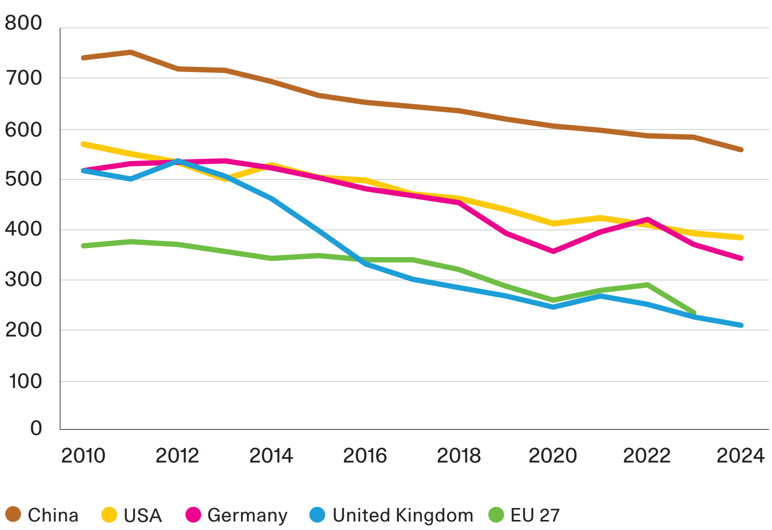
in g CO_2/kWh



Source: Umweltbundesamt

International Comparison of CO_2 Intensity in Electricity Generation

in g CO_2/kWh



Source: Our World in Data

Natural Gas as a Foundation of Industrial Production

Natural Gas Remains Indispensable for Industry

Gases are by far the most important energy source for German industry. 44.4 percent of industrial energy consumption is accounted for by gaseous energy carriers — primarily natural gas, supplemented by biomethane, process gases, hydrogen and liquefied petroleum gas (LPG). Electricity follows at around 21 percent, coal at 14 percent and mineral oil at 9.5 percent. This structure underscores that industrial processes in Germany continue to depend heavily on molecular energy carriers.

The use of gases is concentrated primarily in high-temperature and process heat applications that are indispensable for many industrial production processes. In sectors such as metals, glass, ceramics, paper and food processing, gas is deployed wherever continuously high temperatures, steam or precisely controllable heat are required. Alternative energy carriers can currently meet these requirements only to a limited extent or at significantly higher cost.

Beyond its role as an energy source, natural gas plays a central role as a feedstock, particularly in the chemical industry. Natural gas provides not only energy, but also the carbon and hydrogen atoms contained in methane (CH_4), which form the basis of key industrial value chains. From this feedstock, basic chemicals such as ammonia and methanol are produced, as well as numerous precursors for plastics, fertilisers and industrial intermediates.

Around

1.8 million

industrial and commercial enterprises are supplied via the gas distribution system.

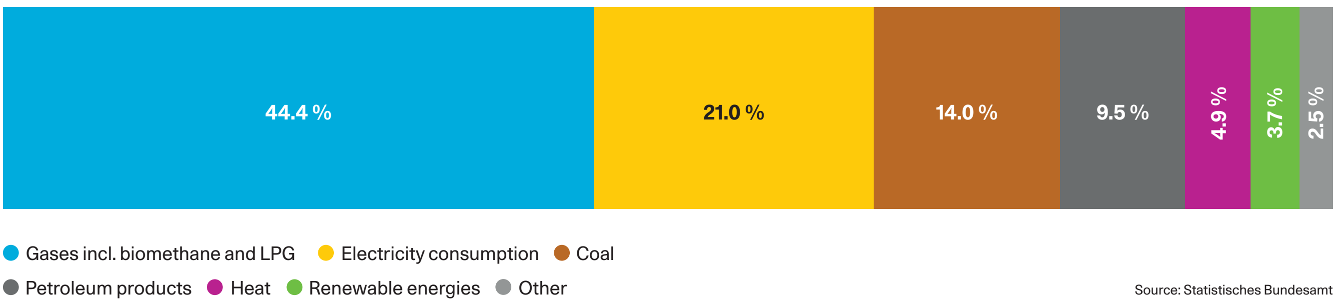
The European chemical industry covers roughly one third of its energy consumption with natural gas. At the same time, the material use of natural gas represents what is often referred to as a “no-regret application”: this share cannot simply be electrified, as it is not heat that would need to be replaced, but the molecular feedstock itself. Without secure and affordable gas supply, the foundation of basic chemical production in Germany and Europe would therefore be at risk.

Industrial Competitiveness Under Pressure

Gas distribution systems play a central role in this context. Around 1.8 million industrial and commercial enterprises in Germany are connected to these networks. They ensure reliable supply for both the industrial small and middle-sized enterprises and large production sites, and at the same time provide the infrastructure necessary for integrating climate-neutral gases such as biomethane.

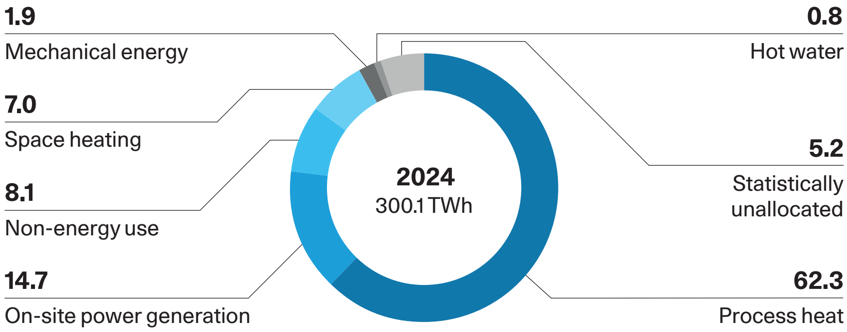
This applies not only to large-scale industry: bakeries, breweries, metal-processing companies and food producers also rely on process heat and steam to ensure uninterrupted operations. The maintenance and further development of gas distribution systems therefore constitute a fundamental prerequisite for industrial value creation and for a successful transition towards climate neutrality. At the same time, German industry

Energy Use in Industry by Energy Source 2024



Source: Statistisches Bundesamt

Natural Gas Consumption in Industry 2024
in percent



Source: Own calculations based on data from the Federal Statistical Office and AG Energiebilanzen

has been under considerable pressure for several years. The production index for energy-intensive industrial sectors remains well below pre-crisis levels. High energy prices, regulatory burdens, increasing bureaucracy and uncertainty regarding future framework conditions have significantly raised production costs in Germany and weakened international competitiveness.

The consequences extend far beyond individual sectors. Energy-intensive basic industries are positioned at the beginning of numerous industrial value chains. When production capacity is reduced, plants are shut down or investment is postponed, downstream sectors are also affected — from mechanical engineering to construction and the broader industrial small and medium-sized enterprises.

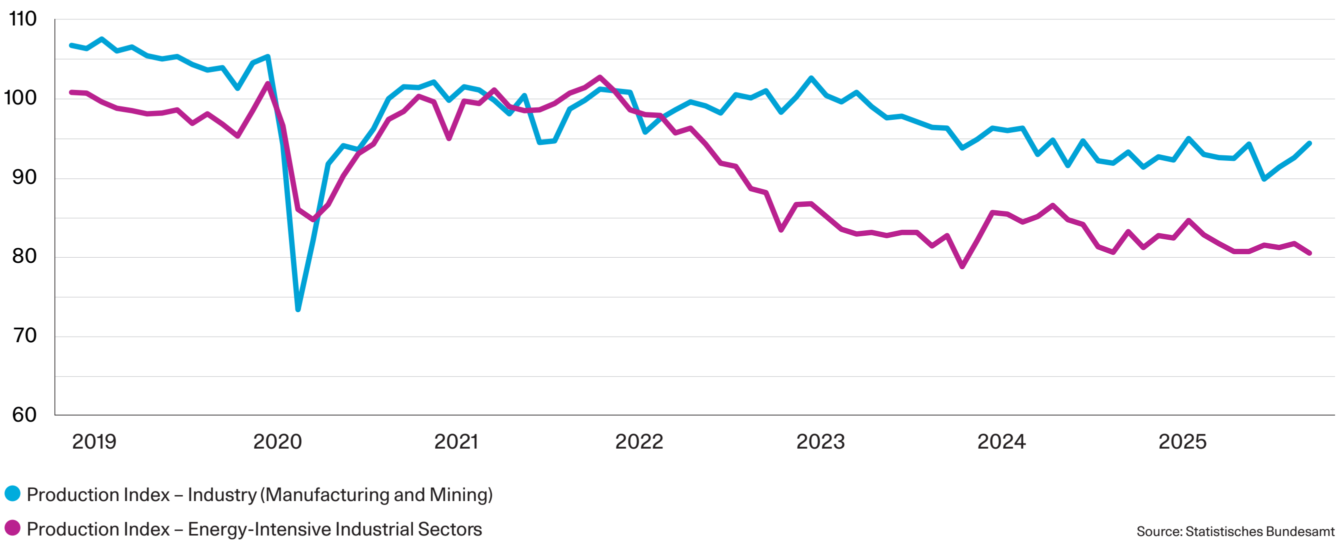
The risk of carbon leakage is therefore increasing. Relocation of production to regions with lower environmental and climate standards would not only weaken Germany as an industrial location, but also undermine climate policy objectives.

A lack of planning certainty in energy and infrastructure policy acts as a brake on investment. Without reliable prospects for competitive energy supply, necessary transformation investments are either postponed or carried out outside Europe.

Particularly energy-intensive sectors such as chemicals, steel and other basic materials industries are facing mounting challenges. According to the European Chemical Industry Council (Cefic), capacity utilisation in the EU chemical industry stood at only 74 percent in 2025, significantly below the long-term average of over 80 percent. Low capacity utilisation is thus both a visible symptom of industrial strain and a factor that further intensifies pressure, as fixed costs are distributed over lower output volumes and investment activity declines.

The conclusion is clear: without gases, there is no industrial value creation in Germany — and without industrial value creation, there can be no sustainable economic growth. A secure and, in the long term, climate-neutral gas supply therefore remains an indispensable foundation for Germany as an industrial location.

Production Development in Energy-Intensive Industrial Sectors
Base year 2021 = 100



Source: Statistisches Bundesamt

Natural Gas Remains the Backbone of the Heating Sector

Natural Gas Continues to Shape the Housing Stock

Natural gas remains the most important energy source for heating in Germany in 2025. 56.2 percent of residential units are currently heated with natural gas. The long-term trend since 2000 shows a clear and consistent pattern: the share of natural gas in the heating market has steadily increased — from 41.5 percent in 2000 to over 56 percent today. Over the same period, the share of heating oil has declined significantly, from 32.3 percent to just 17.3 percent. This shift in the heating market has been driven primarily by the widespread availability of gas infrastructure and comparatively low modernisation costs. The transition from oil to gas enabled measurable CO_2 reductions and efficiency gains without requiring fundamental changes to buildings or heat distribution systems. Natural gas has therefore established itself as a reliable energy source within the existing building stock. At the same time, the heating market remains strongly shaped by existing infrastructure: heating systems typically operate for decades, and structural change therefore occurs gradually.

District heating also continues to play an important role. Its share in the residential sector increased from 14.2 percent in 2000 to 15.5 percent in 2025. Although growth has been moderate due to high investment costs, district heating is gaining importance, particularly in urban areas. Gas remains central even within district heating systems: approximately 50 percent of the energy used for district heat generation is based on natural gas.

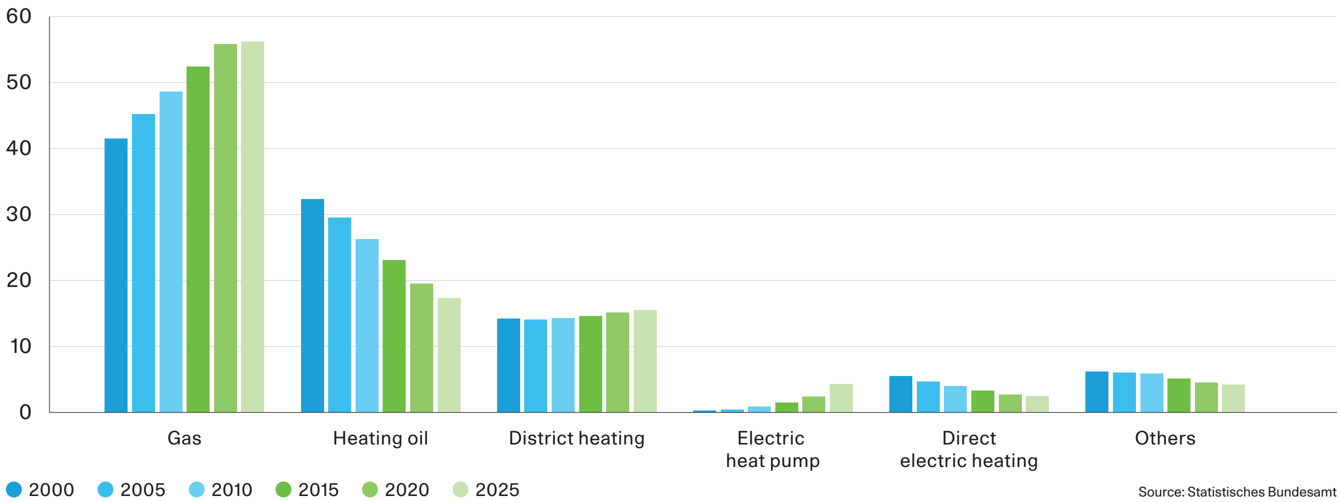
Gas-fired combined heat and power (CHP) plants ensure efficient, flexible and reliable heat supply — particularly in densely populated urban areas with simultaneous high electricity and heat demand. By coupling electricity and heat generation, CHP increases overall fuel efficiency compared to separate production. Other energy sources used for district heating include renewables (19.5 percent) and coal (12 percent). This distribution illustrates that decarbonising heating networks is a gradual process that affects both infrastructure and generation assets.

Heating Market Under Pressure

By contrast, the contribution of electric heating systems and heat pumps within the existing building stock remains comparatively limited. While both technologies together accounted for 5.8 percent in 2000, their combined share in 2025 stands at just 6.8 percent. This illustrates the slow pace of structural change in the existing building stock — and how important a continuous replacement of heating systems is in order to achieve efficiency improvements, emissions reductions and technological modernisation at scale.

Heating Structure of the Housing Stock 2000 - 2025

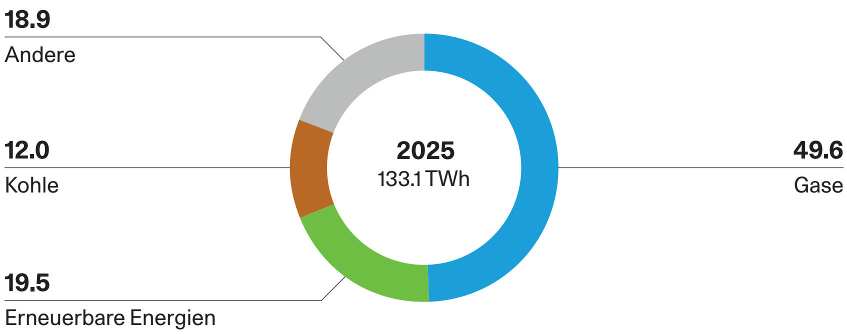
43.6 million dwellings, in percent



Source: Statistisches Bundesamt

Use of Energy Sources for District Heating Generation

in percent



Source: BDEW

The limited structural momentum is also reflected in the market for heating systems. Between 2015 and 2021, an annual average of between 700,000 and 900,000 heating systems was installed. The replacement rate remains too low to modernise the building stock at sufficient speed. With approximately 21 million heating systems in operation and around one million units replaced per year, a full replacement cycle would take roughly 21 years.

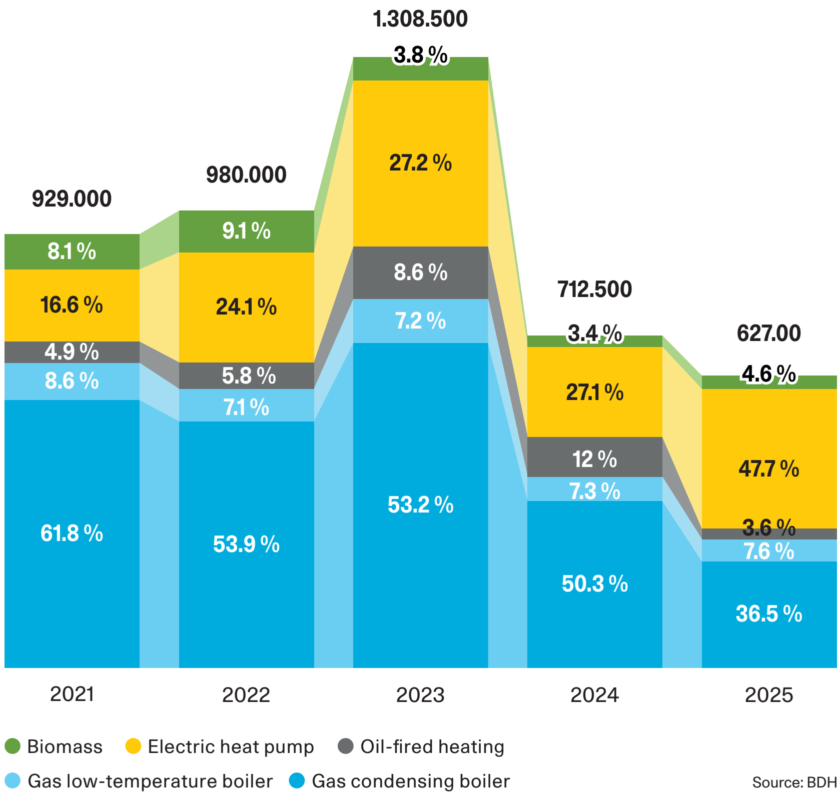
The intense political debate surrounding the Building Energy Act initially triggered a significant pull-forward effect in 2023. With more than 1.3 million heating systems sold, a historic record was reached. Many households and property owners invested ahead of anticipated regulatory changes.

Since then, however, the market has entered a pronounced downturn. The years 2024 and 2025 rank among the weakest of the past decade. In 2025, only 627,000 heating systems were sold — a decline of 12 percent compared to the previous year. The market therefore remains well below its long-term average and continues the downward trend following the record year of 2023. These figures indicate that many investment decisions in the building stock are being postponed, despite substantial renovation and modernisation needs.

A look at installed technologies shows strong growth in heat pumps. For the first time, they account for the largest share of sales at 47.7 percent. Natural gas heating systems follow at 44.1 percent. Modern gas condensing boilers offer high efficiency, comparatively low specific emissions and broad applicability within the existing building stock — often without requiring deep interventions in building envelopes or heat distribution systems. In many cases, they represent a pragmatic replacement option where urgent system renewal is required.

Due to market developments over the past two years, significant CO_2 reduction potential remains untapped, as many investment decisions are being deferred. Uncertainty among property owners remains high, with many delaying decisions in order to avoid reinvestment within a few years. Unclear prospects regarding municipal heat planning, ongoing debates about the future role of gas networks and shifting expectations regarding subsidy schemes and technology requirements have reinforced this hesitation. This slows the replacement of heating systems and delays efficiency gains and emissions reductions that could already be achieved with modern heating technologies.

Installed Heating Systems in Germany 2021–2025



Source: BDH

Biomethane Requires Reliability and Long-Term Perspective

Biogas Enhances Flexibility in the Energy System

Biogas production in Germany is far more than a contribution to renewable electricity and heat generation. It strengthens regional value creation, secures income in rural areas and increases the resilience of the energy system. Biogas plants generate energy where feedstocks are available — decentralised, predictable and largely independent of weather and time of day.

Unlike wind and solar power, biogas can be stored and dispatched according to demand. In an energy system with a growing share of variable renewable generation, this characteristic is of central importance: biogas can adjust electricity output at short notice and contribute to system stabilisation during periods of low wind and solar availability.

Germany currently operates around 10,000 biogas plants with a combined installed electrical capacity of approximately 6,000 MW. They represent a substantial pillar of renewable energy production. Many of these facilities are closely integrated into local material cycles — from agricultural residues and bio-waste to the use of digestate as fertiliser.

However, a significant share of the existing plant fleet will reach the end of its support period under the Renewable Energy Sources Act (EEG) in the coming years. Without viable follow-up business models, plant closures or economically risky continued operation may occur — with negative implications for security of supply, climate protection and regional value creation.

Maintaining biogas within the long-term energy system will require more than simply continuing existing electricity generation models. Rather than relying exclusively on direct power generation, additional incentives and reliable demand markets for biomethane are needed.

In Germany, there are around

10.000

Biogas plants with an installed electrical capacity of approximately.

6.000 MW.

Unlike raw biogas, upgraded biomethane can be injected into the existing gas infrastructure, transported across regions and utilised in multiple sectors. This enables more efficient use of available potential, opens new revenue models and provides a more robust economic perspective for plant operators — particularly in rural regions.

Biomethane as a Near-Term Solution for Transport, Buildings and Power Generation

Biomethane offers precisely this perspective. Today, it is primarily used in combined heat and power (CHP) plants for electricity and heat production, but it is increasingly gaining relevance as a fuel in heavy-duty transport and as a climate-neutral energy carrier in the heating sector. Germany currently operates around 260 biomethane upgrading plants. In 2025, approximately 11.5 TWh of biomethane were injected into the natural gas grid.

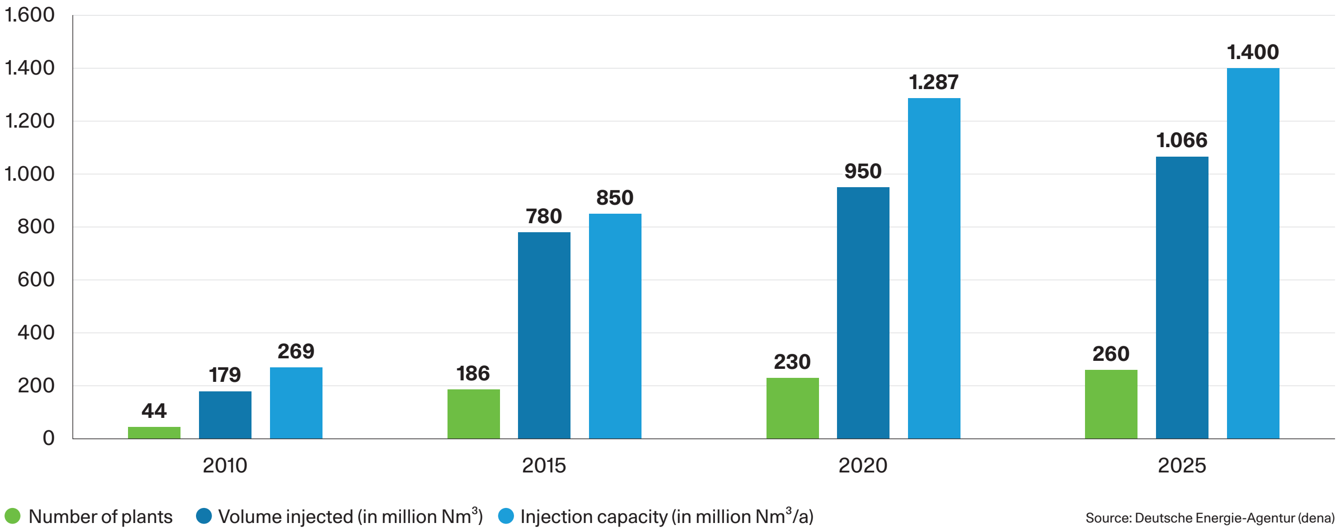
Biomethane represents a key solution component for the transformation of the energy system. It utilises existing gas infrastructure, enables cross-sectoral application in electricity, heating, transport and industry, and can be scaled comparatively quickly. At the same time, it offers a bridge to the hydrogen economy — for example through methanation using biogenic CO_2 or through material use in the chemical sector, such as the production of green methanol.

Biomethane is not a niche issue but part of a broader European trend. Across the European Union, biomethane production has developed dynamically in recent years. In 2023, approximately 4.9 billion cubic metres were produced EU-wide. The European Commission projects that this volume could increase to around 35 billion cubic metres by 2030. Several Member States — including France, Denmark, Italy and the Netherlands — are actively promoting expansion and systematically integrating biomethane into their energy, climate and industrial strategies.

With the expansion of biomethane production, an increasingly integrated European market is emerging. Cross-border trade, harmonised sustainability standards and the use of existing gas infrastructure make it possible to direct biomethane flexibly to sectors where it delivers the highest systemic value — whether

Development of Biomethane – Plants and Feed-in

Figures based on gross calorific value (Hs)



Source: Deutsche Energie-Agentur (dena)

as firm capacity in electricity generation, as a renewable energy carrier in the heating sector, or as a molecular feedstock for industrial applications.

The linkage with hydrogen and CO_2 cycles also opens additional perspectives, including the production of synthetic methane or methanol.

Market Dynamics: Growing Capital Interest

Biomethane is developing into a central building block of a climate-neutral and resilient European energy system. For Germany, this implies consistently advancing existing biogas and biomethane potential as part of an increasingly cross-sectoral gas market.

Alongside its increasing importance within the energy system, a new momentum is emerging in the biomethane market. Across the value chain — from plant operation and efficiency improvements to upgrading and marketing — investor and strategic stakeholder interest is rising.

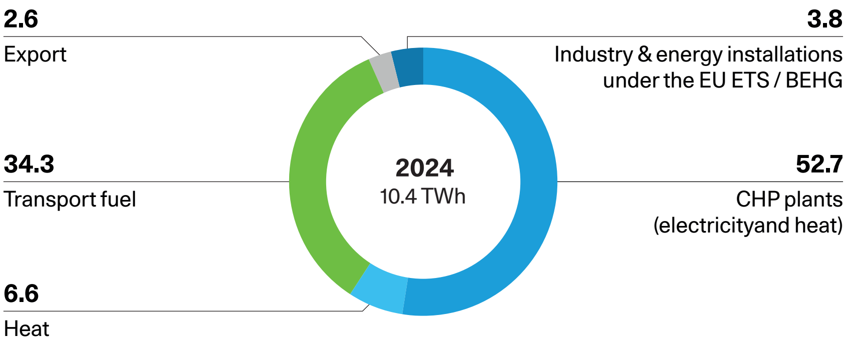
Biomethane is increasingly perceived as a scalable, grid-compatible renewable molecule capable of delivering near-term impact across multiple sectors.

At the same time, the market environment in recent years has been characterised by considerable uncertainty — particularly due to highly volatile revenues in the transport segment and overall fluctuating pricing of climate policy instruments.

Notably, however, where robust certification frameworks, long-term offtake agreements and resilient revenue models come together, projects continue to advance and portfolios are being consolidated. The market is thus beginning to professionalise further — sending clear signals that, despite short-term volatility, biomethane is regarded as a long-term building block of the future energy system.

Use of Biomethane by Sector

in percent



Source: Deutsche Energie-Agentur (dena)

Hydrogen Ramp-Up Depends on Reliable Framework Conditions

Hydrogen Ramp-Up Loses Momentum

Germany's hydrogen ramp-up slowed noticeably in 2025. While the previous year still saw electrolysis projects with a planned capacity of around 11.3 GW by 2030 being announced, this figure has declined significantly. Currently, concretely planned electrolysis capacity stands at around 7.2 GW. Numerous projects have been postponed or cancelled, moving the expansion target further out of reach.

The reasons are clear: key barriers remain high electricity prices and missing mechanisms to reduce production costs for green hydrogen. Despite funding programmes, viable business models are often lacking. High investment costs coincide with limited willingness to pay, as fossil alternatives are frequently cheaper. Regulatory uncertainty adds to the challenge, for example regarding network charges, support conditions Without reliable framework conditions, the ramp-up will not succeed. The market still faces a classic chicken-and-egg problem: supply, demand and infrastructure must develop in parallel. This requires political support — for example through long-term offtake instruments, internationally competitive electricity prices and improved coordination.

The Federal Network Agency's monitoring report also shows that congestion management and loss energy in the electricity system are increasing. This increases the need for flexible, grid-supportive consumers that can absorb surpluses and relieve bottlenecks. Electrolysers can contribute — provided they are integrated into the market and regulatory framework in a way that makes flexible operation economically viable.

Rapid Expansion of the Hydrogen Core Grid Is Critical

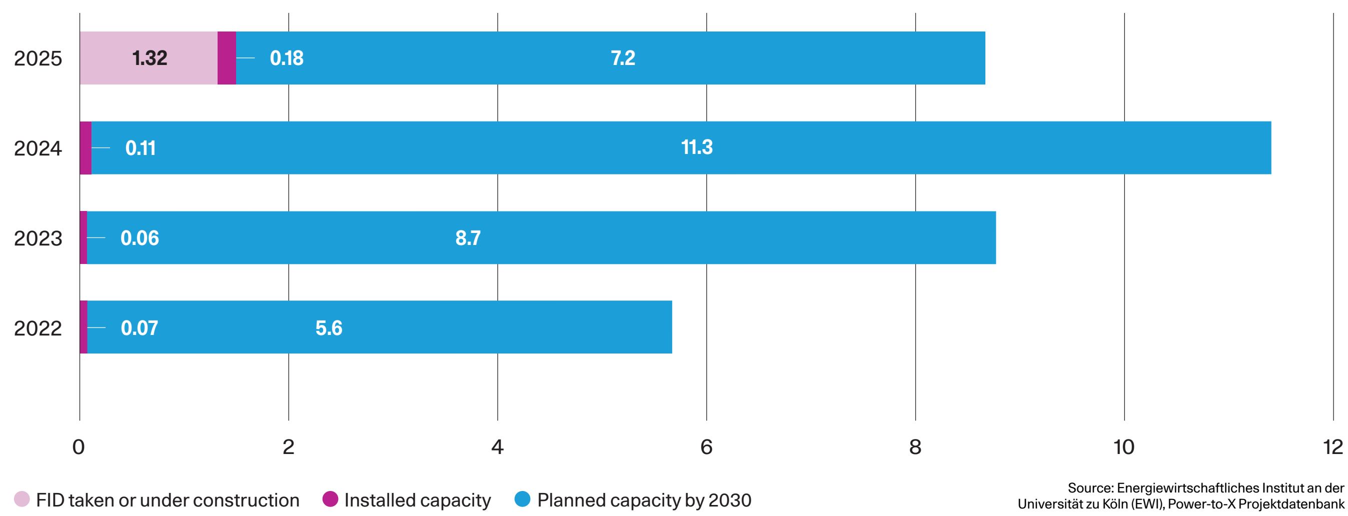
Important first steps were taken in 2025 in building hydrogen infrastructure. With the start of implementation of the hydrogen core grid, concrete pipeline projects were delivered for the first time — primarily through the conversion of existing natural gas pipelines.

In total, around 525 kilometres of hydrogen pipelines were realised, approximately 507 kilometres of which resulted from converting existing natural gas pipelines. These early implementations mark the transition from planning to delivery and send a key signal to the market.

In addition, the topic of hydrogen storage is increasingly coming into focus. Storage will be crucial to balance supply and demand over time and to ensure security of supply — particularly in an energy system with strongly fluctuating renewable electricity generation.

Electrolyser Capacity in Germany

in GW



Source: Energiewirtschaftliches Institut an der Universität zu Köln (EWI), Power-to-X Projektdatenbank

Bio-LNG Reaches Nearly 100 Percent Market Share

LNG Trucks Operate Virtually Climate-Neutral in 2025

In no other sector is tangible climate progress as urgently needed as in transport. While industry, the energy sector and buildings have significantly reduced greenhouse gas emissions since 1990, emissions in the transport sector have declined only marginally — from 163 million tonnes of CO_2 equivalent in 1990 to around 143 million tonnes in 2024.

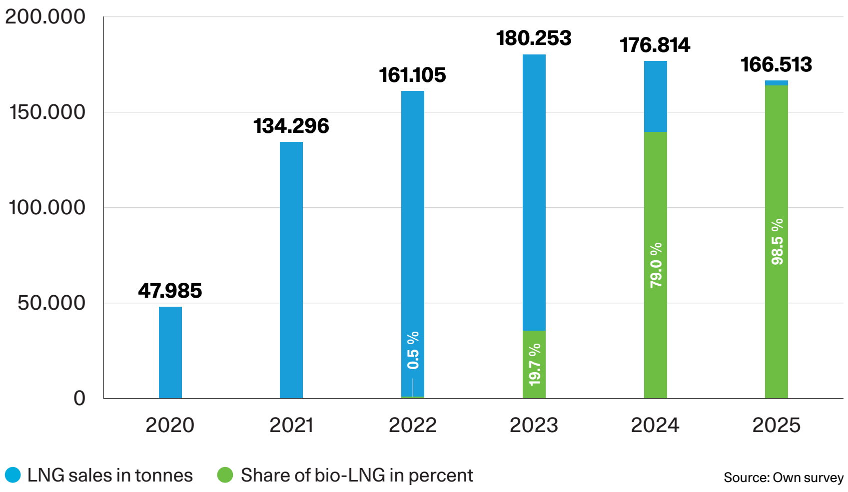
This corresponds to a reduction of less than half a percent per year. Heavy-duty road freight transport remains particularly problematic. Despite efficiency improvements and technological progress, emissions from heavy goods vehicles have not declined over recent decades. Instead, they have increased due to growing transport volumes.

At the same time, Bio-LNG — liquefied biomethane — is already available as a proven and cost-effective climate mitigation option. The climate impact is particularly strong when Bio-LNG is produced from manure, slurry and sewage sludge. Under European standard values, these feedstocks are assigned a negative emission factor of –100 g CO_2eq/MJ, as anaerobic digestion and energy use prevent methane emissions that would otherwise occur during storage and treatment.

The climate contribution of LNG in heavy-duty transport has increased significantly within a short period of time. The renewable share of LNG sales rose from around 17 percent in 2023 to approximately 75 percent in 2024, reaching nearly 100 percent in 2025. Accordingly, greenhouse gas savings compared to fossil diesel have grown substantially.

In 2025 alone, the use of Bio-LNG avoided more than 450,000 tonnes of CO_2 equivalent. In 2025, 199 LNG refuelling stations were in operation across Germany, providing nationwide coverage. Around 167,000 tonnes of LNG were dispensed at these stations during the year. This demonstrates that short-term, effective climate mitigation in heavy-duty transport is already feasible today — provided that market-ready solutions are consistently deployed.

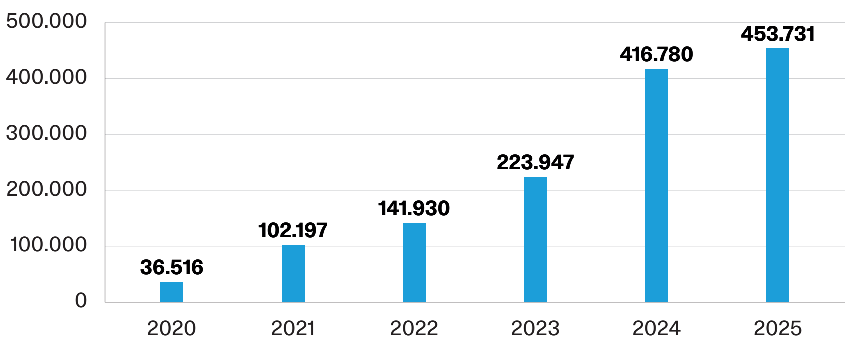
LNG Sales at German Filling Stations



Source: Own survey

GHG savings compared to diesel

in t CO_2 equivalents



Source: Own survey

More than

199

LNG filling stations are currently operating in Germany.

Transforming Energies Safely.

Publisher
DIE GAS- UND WASSERSTOFFWIRTSCHAFT e.V.
Neustädtische Kirchstraße 8
10117 Berlin
Germany

T +49 30 4606015-0
E-Mail: office@gas-h2.de
Web: www.gas-h2.de

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As the voice of the gas and hydrogen industry, the association DIE GAS- UND WASSERSTOFF-WIRTSCHAFT e.V. pools the interests of its members and is committed to utilising the potential of hydrogen and its derivatives as well as biogas and natural gas, including the associated infrastructure. The industry association also provides information on the opportunities offered by gaseous energy sources and their infrastructure in a climate-neutral and resilient energy system and drives the industry's transition to new gases. It is supported by leading companies in the energy industry and covers the entire value chain from production, transport and distribution to trading, sales and applications. Other industry associations and industrial companies support DIE GAS- UND WASSERSTOFF-WIRTSCHAFT e.V. as partners.