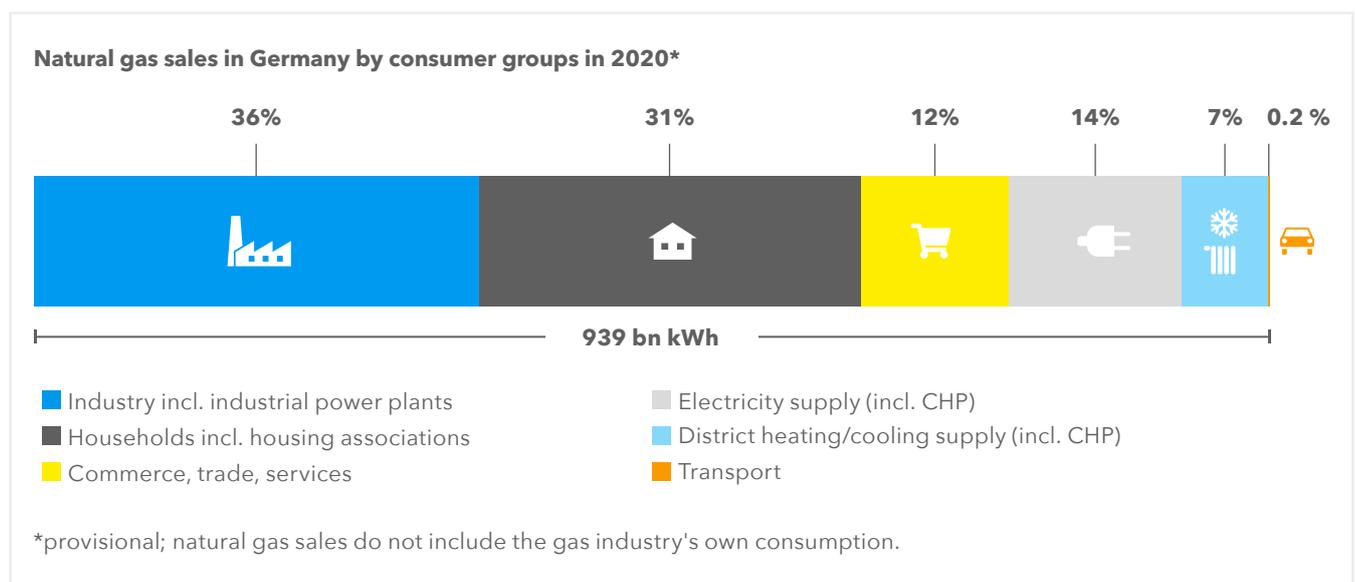


Natural gas in industry

Versatile and flexible energy source with an elementary role

The numbers tell a clear story: natural gas is indispensable, especially for industry and industrial applications. **In 2020, 36 percent of natural gas sales were to industry and industrial power plants.**¹ This means that industry has the greatest demand for natural gas in Germany.

The importance of natural gas as a reliable energy source for industry is also shown by the ten-year comparison of consumer groups: in 2010 industry had a natural gas share of 34 percent, still two percentage points less than in 2020. This shows: The demand for natural gas has been at a **constant high level** for years. And a look into the future also reveals: **natural gas** remains elementary, **especially for industrial applications** – and has **great potential** with regard to the intended use of hydrogen on an industrial scale, since natural gas can be used very well as a basic material for the production of hydrogen.



In industry, natural gas is used in many ways – whether as a pure heat source for heat-intensive processes, as fuel for gas turbines, e.g. in combined heat and power plants for electricity and heat generation, or as an elementary raw material, for example in the production of chemical substances. With a share of 50 percent, natural gas is also the **most important energy source in industrial electricity generation.**²

Natural gas as a basis for chemical substances and fertilisers

Natural gas is also a **valuable raw material** and can be used in different ways through various processing steps. For example, methanol can be extracted from natural gas, which in turn can be used as a basis for the production of chemical substances such as formaldehyde, insulation materials, varnishes, paints, adhesives, fuel additives or acetic acid. In addition, natural gas can also be used to produce fertiliser. Over the course of further processing, the methane contained in the natural gas is combined with nitrogen to produce a nitrogenous fertiliser.³

At a glance: industrial applications of natural gas⁴

Chemical industry: In the chemical industry, natural gas is used as an energy source and raw material. One example is the production of ammonia – an important basic material for fertiliser production. In ammonia synthesis, hydrogen is produced from natural gas, which reacts with nitrogen to form ammonia. The advantage: the high temperatures required for ammonia synthesis can be generated with natural gas.



Glass: In addition to sand, potash, lime and soda, glass production also requires a very high temperature that can be precisely regulated. Natural gas is very suitable for this purpose, as it is a precise and efficient supplier of heat. This means that the temperature can be set very precisely when heating a melting furnace and that the liquid glass mass can be produced from the additives.



Paper production: To produce paper (toilet paper or tissues), a lot of electricity and heat is needed. Both can be generated in state-of-the-art combined heat and power plants with a gas turbine. The electricity is essential for the production processes (e.g. for driving the machines). The heat is needed, among other things, as hot air of up to 500° C to dry the paper webs. In addition, the warm air flow is used to heat the factory halls.



Steel and metal: The production of steel and metal is very energy-intensive and has so far been based primarily on coal-fired blast furnaces. In order to make production more climate-friendly, (green) hydrogen should be used in the future (by using electrolysis, from renewable energies). Until this is possible, natural gas can be used as a fuel substitute for coal, but also as a basic material for the production of (turquoise) hydrogen through methane pyrolysis.



Food and consumer goods: Natural gas is used as an important energy source in food production and processing. One example is meat and sausage production, in the manufacture of so-called sausage casing. Here, natural gas is used, among other things, as a fuel for modern gas turbines to generate the energy required for the factory halls. In addition, natural gas also plays an important role as a fuel for heat generation in the drying process.



Automotive: In the automotive industry, natural gas is used, among other things, as fuel for industrial furnaces to heat steel sheets at very high temperatures before they are formed and cooled. These are used in vehicle production, for example for the passenger cell of a car. The advantage: as a primary energy source, natural gas is cheaper, more climate-friendly and technically compatible.



Conclusion

For industry, the versatile and flexible use of natural gas is irreplaceable – and as a bridging technology of the energy transition, it is more CO₂-efficient than coal and oil. In addition, natural gas is the most important fuel for modern combined heat and power plants to generate electricity and heat.⁵ This shows: natural gas is the reliable backbone of the manufacturing economy – from medium-sized industry to industrial parks.

Sources:

¹ BDEW: Natural gas sales by customer group (05/2021): www.bdew.de/service/daten-und-grafiken/erdgasabsatz-nach-kundengruppen/
² Federal Statistical Office (10/2020): www.destatis.de/DE/Presse/Pressemitteilungen/2020/10/PD20_410_43312.html
³ BDEW: Three practical examples of the use of gas in industry: www.bdew.de/energie/erdgas/gas-der-industriellen-nutzung-drei-praxisbeispiele/
⁴ WINGAS: www.wingas.com
⁵ Federal Environment Agency: Combined Heat and Power (06/2021): <https://www.umweltbundesamt.de/daten/energie/kraft-waerme-kopplung-kwk#kwk-stromerzeugung>