

EXECUTIVE SUMMARY

STRATEGIES TO TRANSITION AWAY FROM RUSSIAN GAS AND DELIVER CLIMATE GOALS IN GERMANY

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Germany faces the twin challenges of rapidly phasing out gas supply from Russia and accelerating onto an emissions reduction trajectory consistent with more than halving emissions by 2030 from 1990 levels and achieving net-zero emissions by 2045. The challenge, however, is significant: in 2020, about 65% of Germany's gas imports were from Russia. This assessment shows that successful pathways to address both challenges effectively do

exist—and, moreover, can be mutually reinforcing. **Through a set of sector-specific strategies to reduce gas demand and parallel strategies to increase gas supply from other regions, Germany can safely move away from Russian gas before 2025, continue to reduce gas consumption thereafter, stay on track to deliver a 2030 coal phaseout, and secure the emissions reductions needed to be on track towards net-zero.**

The key to success requires **immediate actions and investments** in a diverse set of feasible technologies and policy approaches that must be pursued quickly and simultaneously. The ten strategies for sustainable gas reductions, from largest to smallest reductions, include:

1. **Invest heavily in renewable electricity generation, adding 97 GW of solar and 46 GW of onshore wind** through 2027, following the plan announced in the Easter Package by the German government;
2. **Electrify 50% of the gas-based low-temperature heat industrial processes by 2027**, including food and beverages, paper and pulp, machinery, and other sectors;
3. **Double the deployment of heat pumps** in residential and commercial buildings for space heating and hot water;
4. **Retrofit 5% of existing building stock every year to achieve an average of 30% reduction** in total energy consumption for the retrofitted buildings;
5. **Switch 20% of gas consumption in high-temperature heat industrial processes** to low-carbon fuels (biomass and hydrogen) by 2027, including chemical and petrochemical, non-metallic minerals, and iron and steel sectors;
6. **Improve energy efficiency in industrial processes** to lower total energy demand by 9% through 2027;
7. **Improve material efficiency through the economy to reduce food waste**, demand for paper and pulp products, and transport equipment;
8. **Install smart meters for 10% of households and 7.5% of commercial buildings** every year to lower total energy demand in space heating; combined with building retrofits (strategy 4), space heating demand decrease by about 14% from 2015 to 2027, in line with the 18% EU-wide reduction target by 2030;
9. **Change the boiler settings in residential and commercial hot water** for three-quarters of the total population by 2027;
10. **Double the existing biomass combined heat and power (CHP) deployment** to replace gas in electricity and heat generation.

FULL REPORT: [GO.UMD.EDU/GERMANYGAS](https://go.umd.edu/germanygas)

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All these actions can sustainably reduce gas demand, lower emissions, and save energy costs. While some of them require time to implement, temporarily ramping up the operation of existing coal plants and increasing gas supply from other regions could help fill the near-term gap. Specifically, addressing this gap implies an 8-15% increase in coal electricity generation from 2022 to 2024, a two-year delay in the planned retirement of 3.2 GW of coal plants during the same period, and up to 22 bcm of new gas supply through available infrastructure by 2025.

When combined with the ten strategies listed above, **emission impacts from these short-term coal increases can be offset by a larger reduction in overall energy demand with efficiency improvement and demand management efforts** outlined here, even in 2022. Moreover, overall emissions continue to decline with these efforts in combination with rapid renewable deployment and are potentially

accelerated in the medium and long term in line with 1.5C trajectories. As a result, energy CO2 emissions from electricity and heat generation, industry, and buildings decrease by 177 MtCO2 or 43% from 2021 to 2027. Last but not least, the reductions in gas consumption through 2027 can save nearly 30 billion Euros if gas prices stay at the recent high level.

These results show the potential major benefits of a concerted and well-coordinated strategy for implementing emergency energy security actions in a way that also prioritizes climate outcomes. Seizing this opportunity will require significant near-term investments in infrastructure that may not see all benefits realized today. Joint work across the EU will be needed to ensure that enhanced investments for climate-friendly strategies are not offset by support for long-term fossil-intensive infrastructure in other areas.

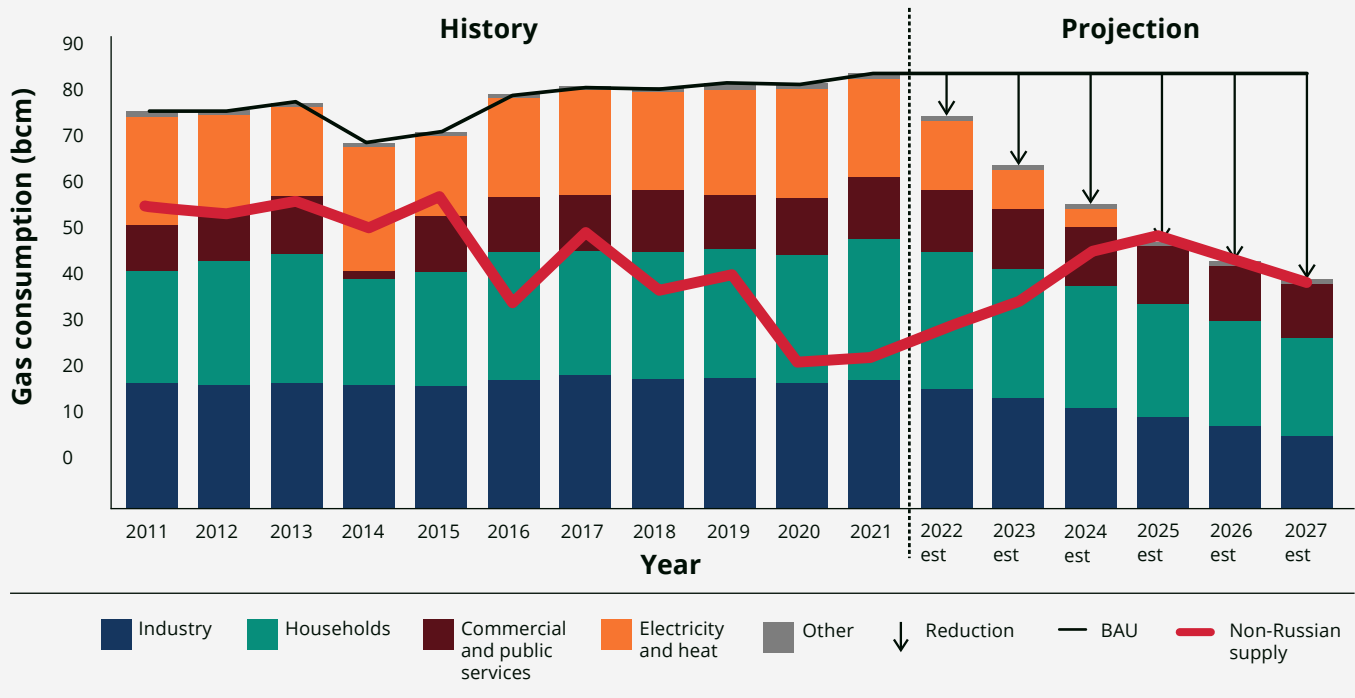


Figure 1. Historical and projected gas consumption by sector (bars) and non-Russian gas supply (line). The figure shows historical data to 2021 and projections of the medium scenario from this analysis. The magenta line shows the level of non-Russian gas supply. Non-Russian gas supply meets demand in 2025 in our analysis.

¹Data source: Eurostats, <https://ec.europa.eu/eurostat/data/database>