

Germany: Limiting economic pain from going cold turkey on Russian gas

25 March 2022



Katharina Utermöhl
Senior Economist
Katharina.uterhoehl@allianz.com

Markus Zimmer
Senior ESG Economist
markus.zimmer@allianz.com

EXECUTIVE SUMMARY

- Should gas supplies from Russia come to a halt, we estimate Germany's supply gap at 30% of total gas consumption. Additional storage withdrawal, tapping new gas suppliers, substitution measures such as fuel-switching (from gas to other energy sources such as coal and nuclear power) and self-rationing by the private sector due to sky-high gas prices will help reduce the shortfall and cause limited economic disruptions. However, the remaining gas supply gap of 13% will require rationing actions.
- The impact of rationing on economic activity and employment in Germany will depend to a large extent on which gas consumers will have to face the brunt of the shortage. Household gas consumption – which is currently protected by Germany's Gas Emergency Plan – offers significant saving potential. For every 1pp reduction in the gas consumption of households, gross value added to the tune of EUR2.5bn and up to 25,000 jobs will be protected in manufacturing – not accounting for positive second-round effects. To limit the economic outfall, the burden of rationing should hence be spread widely.

The risk of a rationing scenario is rising.

This week, Germany announced that it plans to wean itself off Russian gas by mid-2024. However, the ongoing escalation in tensions between Russia and the West – including Russia's demand to be paid in rubles – could ring in a "black-out" scenario¹ well before that. In this context, it is no surprise that German authorities are preparing for a potential rationing of energy.

Estimating the gas supply gap.

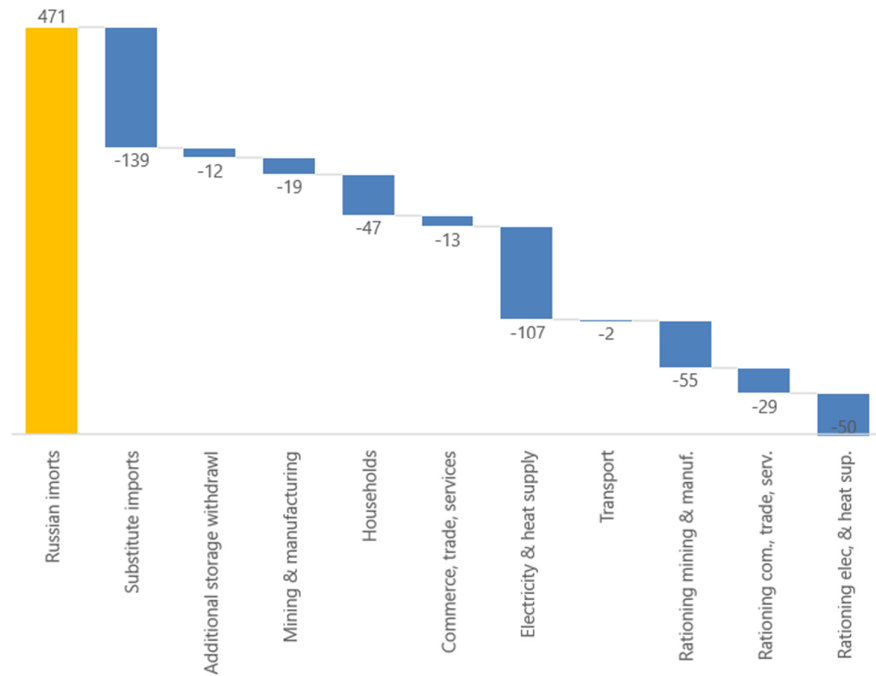
In 2021, supply from Russia accounted for 55% of total gas consumption in Germany. Since October 2021, however, deliveries from Russia have decreased, and the share of imports is currently below 40%. Should gas supplies from Russia come to an abrupt halt, the supply gap should be much smaller (around 30% of total gas demand, see also energy flows Figure 4).

As seen in Figure 1, additional imports from other suppliers can substitute for one-third of Russian imports used in Germany (the increased US gas exports to Europe for 2022 announced

¹ See our report [Economic Outlook: Energy, trade and financial shockwaves](#).

this week already represent 30% of these import substitutes)² while additional storage withdrawal can also contribute on the margin. In addition, sectoral substitution measures (such as fuel-switching from gas to other energy sources such as coal and nuclear power) together with self-rationing by the private sector due to sky-high gas prices would further reduce the gap by 40% without causing fundamental disruptions to the economy. However, the remaining gas supply gap of 30% of Russian imports (132 TWh or 13% of total gas demand) would require rationing actions.

Figure 1: Estimating the gas supply gap (in TWh)



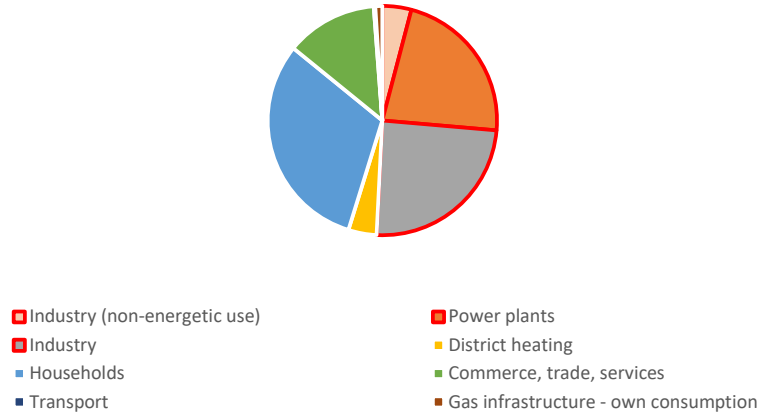
Source: Allianz Research, IEA, bdew, AGORA, Destatis

Spread the rationing pain widely!

The impact of rationing on economic activity and employment in Germany will depend to a large extent on which gas consumers will have to face the brunt of the shortage. Germany’s gas emergency plan currently stipulates that certain protected consumers of natural gas - including above all private households but also the commercial, trade and services sector (given that it includes basic social services) – cannot be subject to rationing.

²The European Commission calculates with additional imports of around 50 bcm in the current year, of which the US 15 bcm constitute 30%. 50 bcm are an equivalent of 488 TWh of which Agora estimates that 139 TWh will reach the German gas market. Consequently the US commitment lowers the German gas gap by 42 TWh.

Figure 2: Gas consumption by consumer group (% total)



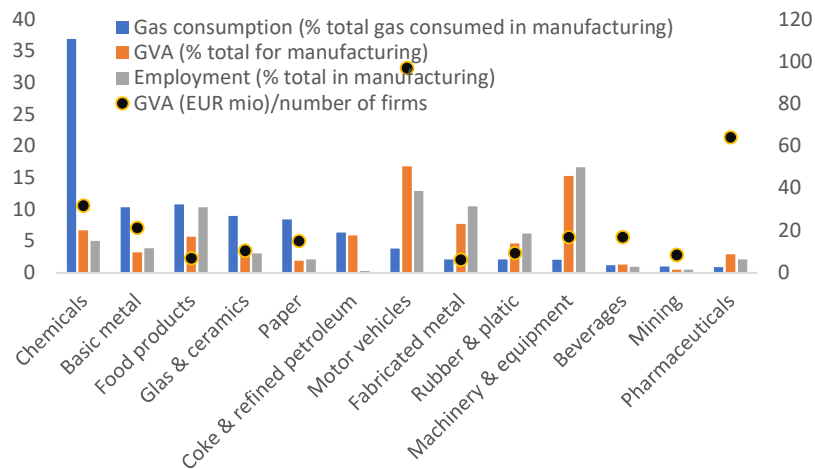
Source: Destatis, Allianz Research

When factoring in district heating used by households, protected customers made up 49% of total gas consumption in 2021. Therefore, under this emergency plan, the remaining gas consumers – above all industry and electricity and heating suppliers – will have to bear the brunt of any rationing impact, which would call for sharp cuts in their gas consumption.

Gauging the black-out risk by manufacturing sector.

The factors that could be used to determine a sector’s rationing potential include (1) a high absolute consumption of gas and (2) the presence of large firms.

Figure 3: Gauging black-out risk by sector



Sources: Destatis, Allianz Research

Judged on the first metric, the chemical sector stands out with the highest absolute consumption of gas (37% of the total consumed in manufacturing), followed – with some distance - by food, basic metals, glass & ceramics, paper and coke & refined petroleum. The remaining sectors each account for less than 5% of total gas consumption in manufacturing and hence offer a much more limited rationing potential.

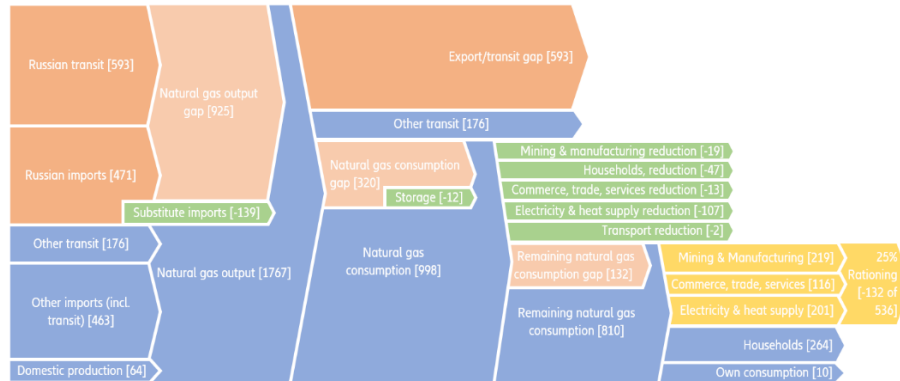
Rationing gas supply to German manufacturing could lead to serious economic disruptions.

Given highly specialized production processes, and in turn a low ability to engage in fuel-switching, the rationing of gas supply to industry will inevitably halt production. This concerns above all the chemicals sector, which also uses gas in a non-energetic manner i.e. as a production input. Apart from the gross value added and the employment put at risk by rationing-induced production stops, second-round effects such as heightened supply-chain disruptions in other sectors that depend on inputs subject to rationing could prove significant. In contrast, the impact on electricity suppliers should prove less painful, given their higher fuel-switching ability.

To reduce the economic pain, the rationing pain should be shared more evenly. Households should be included in any forced-rationing to reduce the economic pain instead of centering it on German industry. Maintaining their preferential treatment laid out in the Gas Emergency Plan (we do assume that households contribute through behavioral changes and reduce their consumption by 15%, particularly as energy prices surge)³ calls for a 25% cut in the remaining gas consumption in industry, services and utilities through rationing. Exploring the gas energy flows in Figure 4 shows that even a full stop to gas consumption in the industry alone would not bring about sufficient savings to close the gas supply gap.

³ The Agora study "Energiesicherheit und Klimaschutz vereinen – Maßnahmen für den Weg aus der fossilen Energiekrise" (Energy security and climate protection unite - measures to get out of the fossil energy crisis) gives a detailed breakdown of the measures in households and the service sector. These include reducing the room temperature by approx. 1 °C (this reduces the heating energy requirement by an average of 6%), reducing hot water consumption by changing behavior and using economy fittings, hydronic balancing and operational optimization of the heating systems, short-term building insulation measures (with simple and quick insulation methods that can be implemented by private individuals, for example on heating pipes and niches as well as windows), increased short-term use of wood stoves and propane gas heating systems, short-term installation of heat pumps, efficient end devices and lighting, conversion from cooking gas to electricity and propane gas and the replacement of gas external wall heating systems with monoblock -(Wall) air conditioners. The price elasticity of the demand for natural gas in the building sector is low in the short term and the most effective measure - lowering the room temperature - is only possible if consumers accept a significant loss of comfort.

Figure 4: Estimated gas energy flows & projected reductions (2021)



Source: Allianz Research, IEA, bdew, Destatis, AGORA

Meanwhile, household gas consumption offers substantial savings potential, for instance in heating, at a low economic cost. A reduction of the room temperature in the heating period by three degrees on average leads to savings in gas consumption that are equivalent to the total combined gas consumption of the basic metal and food products sectors (about 50 TWh) – which in 2020 accounted for a gross value added of EUR53bn and employed roughly 1mn people. As every second company in the sector relies on gas⁴, around 25% would face severe production cuts if exposed to gas rationing. More generally a 1pp reduction in the consumption of gas by households helps protect EUR2.5bn in gross value added in the manufacturing sector and around 25,000 jobs – not accounting for potential second-round effects along the production chain⁵.

The required reduction in gas consumption could also be achieved by lowering the remaining gas consumption in households by 50%, or, on paper, to stick to our example, the equivalent of reducing the room temperature in buildings by 9°C. It seems advisable to go towards neither extreme but to consider spreading the burdens over a broader base of contributors and to exploit concentrated measures that have proven to work other contexts. Utilizing the full potential of remote working could, for example, allow for the reduction of office heating.

The most efficient way to achieve such measures is through sufficiently high energy prices, which in turn must be accompanied by targeted fiscal transfers to lessen the burden for vulnerable households and businesses. It is essential, though, that the transfer mechanism doesn't counteract against the price signal as otherwise the intended demand reduction will not materialize. Protecting households on the expenditure side by imposing price ceilings or

⁴ The evidence on the structural decomposition of fossil fuels by number of companies that use them in a sector is scarce. It typically focuses either on electricity production or heating systems. Looking at the difference between the winter maximum and summer minimum in gas usage by sector, we see that about 75% of gas usage is related to seasonal heat demand, with industrial demand being slightly less seasonal than in the other sectors September demand being around 30% of January demand.

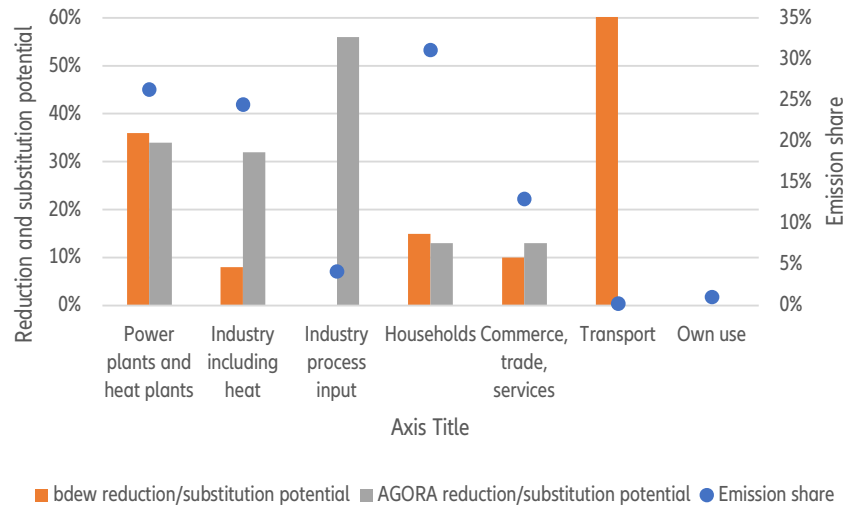
⁵ Using the simplified assumption that the 25% of gas usage for non-seasonal heating leads to a similar fraction of business activity to close down. Total GVA positively exposed to the benefits from a 1pp reduction in the consumption of gas by households is about EUR1bn, which is associated with 100,000 jobs.

subsidies for gas is very short-sighted, as they will only be hit harder on the income side when the alternative of rationing leads to inefficient business disruptions.

ANNEX

Comparing the reduction and substitution potentials in different sectors over recently released studies by bdew and AGORA, we see close correlations for power and heat plants as well as for households and commerce, trade and services (AGORA observes the latter ones combined as buildings). The transport sector is neglected by AGORA but it is also neglectable by total gas consumption. The main remaining difference is the industry for which the bdew sees a reduction potential below 8% while AGORA suggests a potential of more than 30%.

Figure 5: Comparison of reduction potentials



Source: Allianz Research, bdew, Agora

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