Investment Institute Macroeconomics

Can Europe make it through another winter?

An update on Europe's gas crisis and a case study on Germany

Macroeconomic Research

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Key points

- In August 2022, Russia cut off its Nord Stream gas pipeline to Europe, triggering an unprecedented gas crisis. But the worst-case scenario was avoided thanks to a mild winter and material efforts in place to save gas consumption
- However, Europe's energy supply is still in a state of transition and despite lower risks, some uncertainties persist
- In this paper we review the current situation in Germany, Italy and France and explore different potential scenarios for this winter
- We also address France's nuclear programme and its uranium procurement

Another winter, another story

In August 2022, Russia cut off its Nord Stream gas pipeline to Europe, triggering an unprecedented gas crisis and prompting many - including ourselves - to predict a sharp contraction in output over the winter period. However, ultimately the Eurozone contracted by just 0.1% in Q4 2022, albeit with the German economy suffering a 0.4% drop that quarter and a recession. The impact could have been much worse without a mild winter and material efforts in place to save gas consumption.

But the risks to European economies are not restricted to last winter. European energy supply is still in a state of transition and although it made this adjustment more benignly than expected in 2022, risks remain for this year. In this research note, we review the outlook for this winter season - for most Eurozone economies, access to gas should be better than last year; however, Germany – historically the biggest beneficiary of Russian gas – is still the economy most at risk. We review the current situation in Germany, Italy and France and explore different scenarios for this winter.

It's all about supply…

Not long ago, Germany imported approximately 50% of its total gas supply from Russia[1] and had no capacity to import liquefied natural gas (LNG). Events have however moved quickly and today Germany does not receive any gas from Russia but owns three floating storage regasifications units (FSRU) through which it can import LNG from the rest of the world. LNG imports now partially compensate for approximately 15% of previous Russian imports (Exhibit 1). Moreover, Germany is not far from doubling its import capacity by year-end (up to around 30-35% of 2021 Russia supply). Installation of the first three FSRUs respected initial timelines and so we assign a high probability that the rest will follow.

Otherwise, Germany strongly rely on Norway which now represents almost half of its consumption. However, it can no longer rely on Dutch production as the Netherlands confirmed the closure of its Groningen production site.[2]

Exhibit 1: Germany ramps up on LNG imports

Source: Eurostat and AXA IM Research, September 2023

…and demand

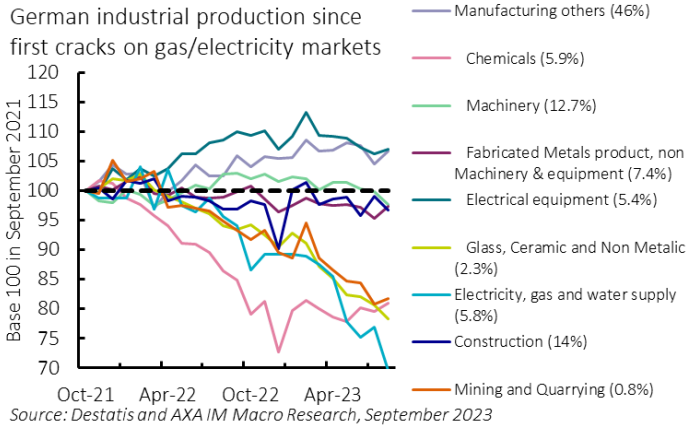
Last autumn and winter, German gas consumption was approximately 16% below the average level of the last decade. In detail, power generation and large industries - which represent broadly 60% of total consumption – consumed 20% less gas than the previous decade's average. Heating and small industries saved 10%. As of October 2023, the efforts are even more pronounced as total gas consumption is standing at around -30% of usual consumption. We believe this is due to households that have delayed starting their heating systems due to very mild temperatures. It is also true that price incentives to save gas remain extremely high. Indeed, despite a government intervention at the beginning of 2023, German gas bills didn't decline and broadly remain at twice the prices paid before the beginning of the war in Ukraine[3].

At this stage, it is very hard to distinguish between structural savings (permanent reduction of energy waste and switches to alternative power) and conjunctural savings (higher prices forcing companies to prioritise or temporarily stop some activities).

On the first, we can have a look at German electricity consumption which is broadly down by 10% versus 2021 levels while prices are broadly evolving in parallel with gas[4]. This probably means some households and small industrial processes shifted from gas powered equipment to electricity - otherwise electricity consumption would have been lower. However, we doubt heavy industrial processes based on gas have transitioned already to electricity due to technical constraints and/or costs.

The latest can be confirmed by looking at output in intensive energy industries such as chemicals, glass, ceramics and fabricated metal products and we observe a large drop since the beginning of 2022. In other words, they have voluntarily reduced output due to rising input costs (Exhibit 2). Such reductions are likely to persist until energy prices fall, either from underlying market prices or from further government intervention. Indeed, the German government implemented a theoretical cap for energy costs for industries, which is still in place at 7 cents for gas and 13 cents for electricity (up to 70% of consumption). But prices are still very elevated, around twice the level before the crisis (up to two-and-a-half times at the peak).

Exhibit 2: Strong divergence across German industrial sectors



Source: Destatis and AXA IM Macro Research, September 2023

Still on conjunctural savings, Spanish case is interesting. After prices skyrocketed in 2022, they have substantially eased in 2023 due to lower spot prices[5] and government interventions.

[1] *Source: Bundesnetzagentur - Press - Bundesnetzagentur publishes gas supply figures for 2022*

[2] *The Netherlands will remain an important partner but only as a gas reexporter. Les Pays-Bas ferment les vannes du plus grand gisement de gaz d'Europe | Les Echos*

[3] *Data extracted from monthly HICP German data on gas.*

[4] *Electricity prices are set by the variable cost of the marginal plant, i.e., the most expensive plant that is required to serve demand, and this is usually the gas plant.*

[5] *Spanish gas contracts are extremely volatile as a large part is indexed on spot market.*

Looking again at gas consumer bills from HICP data, Spanish households now broadly pay the same price but the impact on consumption is mixed. After falling by 30% last autumn/winter, gas consumption is now only at -15% but seems to be only explained by lower gas use from industry[6] while households have normalised their consumption benefitting from diminishing price incentives.

It is too early to conclude but at present, it seems that most of the consumption was reduced by higher prices. At this stage, it does not represent a key risk for gas consumption as prices remain high in almost all countries, but this reminds us the importance of price signal (in both side).

The gas outlook

The outlook for industry – particularly intensive energy users – remains bleak. We don't see any near-term improvements coming from the cost or demand side, with outlooks for Chinese and US economies both relatively weak. In other words, a revival of gas demand from industrial consumption looks unlikely.

For households, the price signal provided a useful tool to reduce gas and electricity consumption. But on the negative side, we believe this impact has likely peaked and the current government energy price cap may disincentivise households to continue to manage their consumption. Moreover, household anxiety was high last year given the Ukraine war and elevated prices, which likely added to household efforts to reduce consumption. We doubt anxieties will be as intense this year.

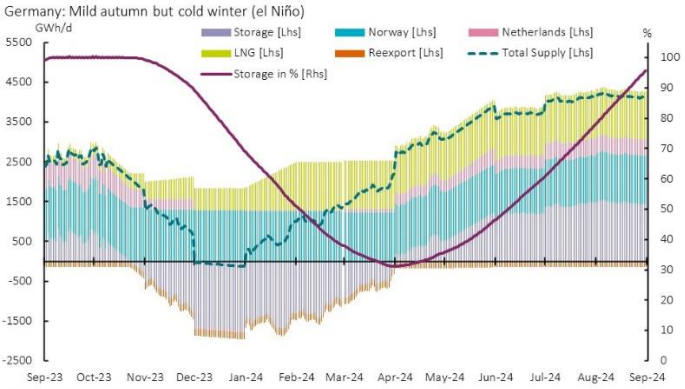
Finally, winter temperatures will be key to determining the demand profile. Winter 2023/2024 is likely to be an 'El Niño' phenomenon. We considered this topic some months ago, looking how this mega phenomenon is currently influencing weather across the globe. In Europe, it is usually characterised by a mild autumn followed by a sharp, cold winter.

Most likely scenario: Beware end-of-winter storage levels

In our baseline scenario we profile the gas demand assuming a typical El Niño effect of a mild autumn and cold winter. We assume current gas consumption efforts of -16% versus the last decade could be replicated until December, but then colder temperatures could force households to increase gas consumption. However, we doubt consumers would go all the way back to previous levels as gas prices remains above the pre-invasion level. We assume a marginal saving of 5% instead of 10%. This is also consistent with past episodes showing German households increasing gas consumption by some 8% during cold winter episodes. Assuming large industries and power generation remains at the same level of consumption (-20%), that would be consistent with an overall reduction of -14%.

Such a scenario could mean Germany would drain its gas reserves more intensively from January (Exhibit 3). This suggests storage levels would end the winter at around 30% to 35%. This would see Germany comfortably getting through another winter but will cause a strain on imports over next summer. Equally, 30% to 35% storage at the end of this winter is far above 2022's level of 20% (albeit this was while the Nord Stream pipeline was still running) but is below the 2023 level of 65%, which is probably similar to current supply constraints. Replicating 2023's refill pace (0.2 percentage points per day) would take 350 days to replenish reserves. Even if Germany's greater LNG capacity allowed a doubling of this refill pace, it would still need nearly six months and so would be full at the end of September 2024, not allowing any margin for error.

Exhibit 3: Germany is "safe" in our baseline scenario



Source: Refinitiv, assumptions and computations made by AXA IM, as of October 2023

In this scenario, Germany is likely to proceed relatively smoothly this winter, but the focus would rapidly turn to difficulties for replenishing storage for next winter. Hence savings are still welcome and Germany absolutely needs to expand its import capacity.

Alternative but not unlikely scenarios

On one hand, global warming is constantly increasing average temperatures. There are cycles within this trend (some colder, some milder) but another mild winter could occur again. In such a scenario, we can easily assume that previous household efforts would be maintained while our outlook for industry would remain unchanged. Overall, we would have relatively high confidence that Germany would get through this winter without pain and face a less fraught storage refill next summer.

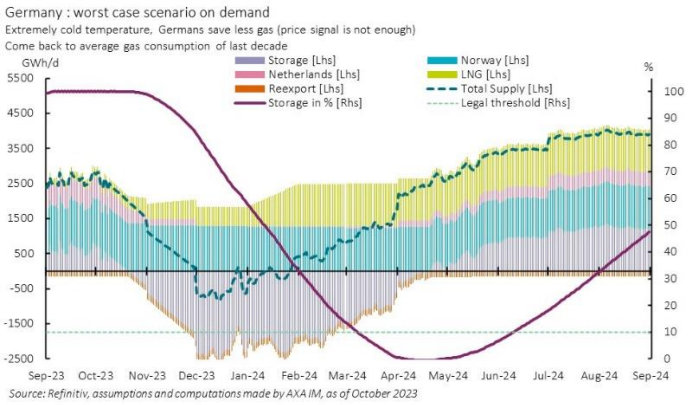
Other alternative scenarios could include supply disruption or an even colder autumn/winter. So far, we have assumed that everything goes well on the supply side, but there are plenty of examples which could trigger a worse outlook: Norwegian pipeline disruption, Germany misses its ambitious timeline for FSRU installation, disruption of the LNG market (Russia still

[6] *Government measures are more supportive for households than for industries.*

delivers 12% of total LNG imports to the Eurozone[7]) and strikes. This creates a skew of downside risks, although such outcomes are clearly difficult to foresee.

Another way to model an extreme, but not unlikely scenario is to look on the demand side. We examine a scenario where consumption edges gradually back to last decade's average (around December) due to a very cold winter and/or fatigued efforts to save gas. This scenario would be painful for Germany, reducing storage to its minimum legal level of 10% by the beginning of March (Exhibit 4). In such circumstances, the government would likely need to pre-emptively ask some industries to reduce activities further (probably around end of Q4 2023). It would also make the outlook for winter 2024/2025 that much more perilous, both as full storage would be hard to achieve over summer 2024 and higher demand would continue to threaten. We consider this scenario as unlikely, but it worth remembering what Germany can afford and what it cannot.

Exhibit 4: Watch out for the slightest slackening on gas savings



Source: Refinitiv, assumptions and computations made by AXA IM, as of October 2023

Is Germany the only country to consider?

We consider the same scenarios (baseline, optimistic and extreme) for Italy, identified last year as the next most vulnerable country after Germany. This time we conclude that Italy should be broadly safe in both most likely scenarios. However, we arrive at similarly worrying conclusions if the extreme cold/rising consumption scenario occurs. Italy would probably get through the winter in this scenario, but storage would be empty by mid-March. Indeed, despite more diversified suppliers[8], this is again a matter of demand and Italy cannot afford to use as much as it consumed before.

For France, the three scenarios point to the conclusion that it should be able to go through the winter, even under the most extreme. The outstanding risk for France concerns LNG supply, with Russia still providing around 20% of LNG imports to France, around 14% of its total consumption[9][10]. Much of this is coming from the Yamal site, a private gas field partially operated by a French operator. We can't exclude a compulsory expropriation. This would force France to increase purchases in the open LNG market, not covered by long-term supply contracts. This should be achievable in volume terms but may have an impact on wholesale gas costs.

The French atypicality

As such, and unlike its neighbours, France does not appear threatened by a lack of gas for this coming winter. However, there is another energy concern for France related to its nuclear generation.

Last year, corrosive issues on several nuclear plants shook the electricity grid and made generator shutdowns a highly monitored issue. It seems to have been successfully resolved for now, but we can't exclude another round of trouble. We are particularly worried about the natural uranium stock. France gets nearly half of its natural uranium from Kazakhstan (27%) and Uzbekistan (19%). Despite being independent countries, both have strong ties with Moscow, highlighted through recent Russian military support after massive protests in Astana in January 2022. Moreover, much of this uranium is transported through Russia before arriving in Europe[11]. Niger, another supplier, also represents a risk after its recent military coup. Niger supplies 20% of France's uranium. Currently, France has approximately two years of natural uranium[12] (a bit more including depleted uranium). This seems manageable for the immediate outlook, but the stock would rapidly decline if flows are disrupted.

[7] Source: Refinitiv

[8] Italy imports approximately 70% of its gas through pipelines (Algeria+Libya =70%; Azerbaidjan=30%) and 30% with LNG, splitted between Qatar (39%), the US (31.4%), Algeria (16%) and others Source: Refinitiv

[9] France imports approximately 1/3 of its gas from Norway through pipelines and 2/3 with LNG (45% from the US, 9% from Qatar, 15% from Algeria, 20% from Russia and 11 from other countries. *Source: Refinitiv*

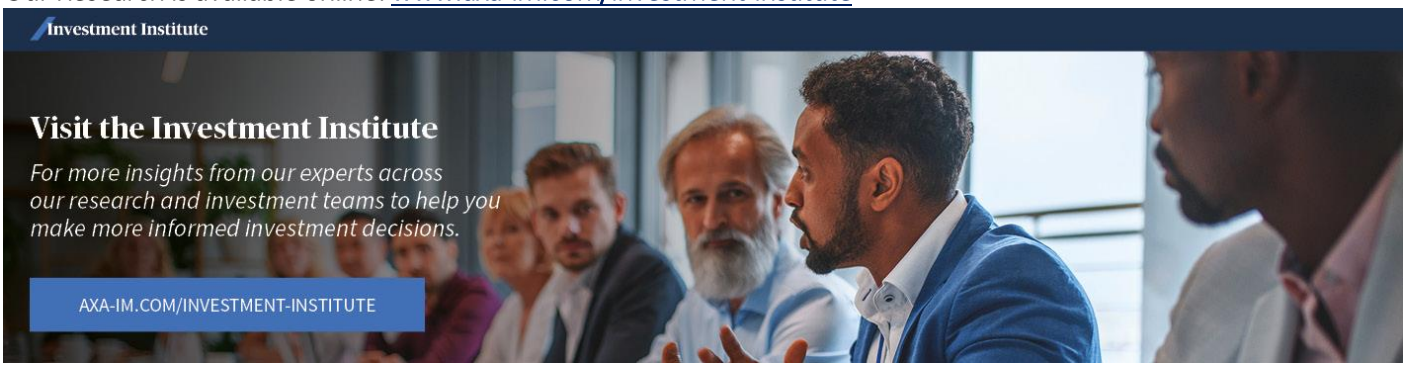
[10] If we expand this to the Eurozone, Russia is still providing 12% of total LNG imports. This represents a major risk for the bloc. *Source: Refinitiv*

[11] Anna Creti, Economic teacher at Paris Dauphine-PSL University in October 2022

[12] Figure published by Orano on September 6, 2023

19 October 2023

Our Research is available online: www.axa-im.com/investment-institute



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