European Economics Analyst

The Impact of Gas Shortages on the European Economy (Schnittker)

- Europe heavily depends on Russian natural gas, with Russia accounting for about one-third of the Euro area's imports. With the Euro area generating about 25% of its energy from natural gas, we assess the impact of any further gas import disruptions due to the war in Ukraine on Euro area output and inflation.
- Given the high degree of uncertainty, we consider three scenarios: first, one in which there are no further supply disruption beyond the flow reduction since last September; second, a scenario in which gas imports through Ukraine cease for the remainder of the year; and third, a full stop of all Russian pipeline imports to Europe, also for the remainder of the year.
- By mapping physical gas supply constraints and upwards price pressures into GVA effects in the Euro area and the UK, we estimate that for 2022 as a whole-high gas prices could weigh on Euro area GDP growth by 0.6pp and the UK by 0.1pp relative to our baseline forecast if we assume no further gas supply disruptions. The impact in Germany is likely to be even greater (-0.9pp) due to its high reliance on Russian gas. The scenario in which Russia stops all pipeline exports could see Euro area GDP growth fall by 2.2pp in 2022 relative to our baseline forecast, with sizable impacts in Germany (-3.4pp) and Italy (-2.6pp).
- Turning to inflation, the scenario in which gas flows through Ukraine are stopped would add at its peak in December 2022 about 0.7pp to our Euro area headline inflation forecast. If gas prices rise further due to gas pipeline flows from Russia being shut down, our headline inflation forecast could be up to 1.3pp higher, with likely also significant pass-through into core prices. In the UK, we expect a range of 22% to 90% for the October price cap under the three scenarios, signalling two-sided risk around our current assumption of 55%.

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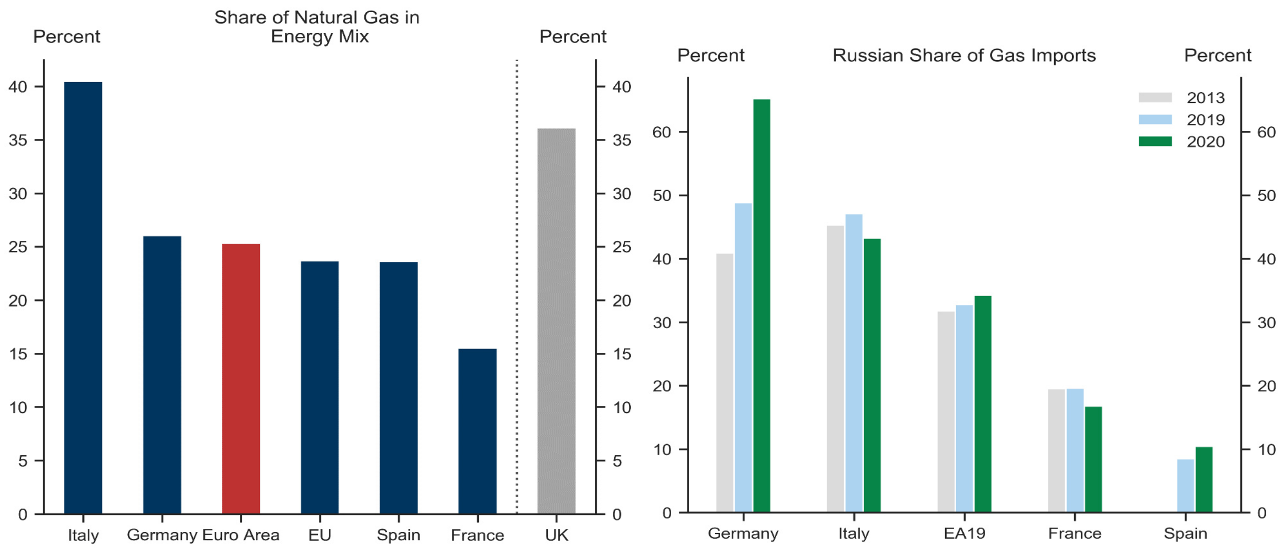
The Impact of Gas Shortages on the European Economy

In light of Russia's war against Ukraine, investors have increasingly become concerned about Europe's dependence on Russian energy supplies, in particular natural gas. In today's Analyst, we assess the impact on activity and inflation across three scenarios: first, no further Russian gas flow disruptions in addition to the curtailment of flows from September last year; second, a supply stop of gas flowing through Ukraine lasting throughout the year; and, third, a total stop of pipeline flows of Russian gas to Europe for the remainder of the year.

Europe's Heavy Reliance on (Russian) Natural Gas

Europe relies on natural gas for about one-quarter of its energy supply (Exhibit 1, left). Across countries, the dependence in Italy and the UK at 40% and 35%, respectively, stand out, and ex ante suggest a bigger exposure to any gas shortages. Zooming in on the reliance on Russian gas in particular, Germany (~50% of its total imports) and Italy (~45%) are noticeable, while the UK's exposure with a Russian gas share around 5% is much smaller (Exhibit 1, right).

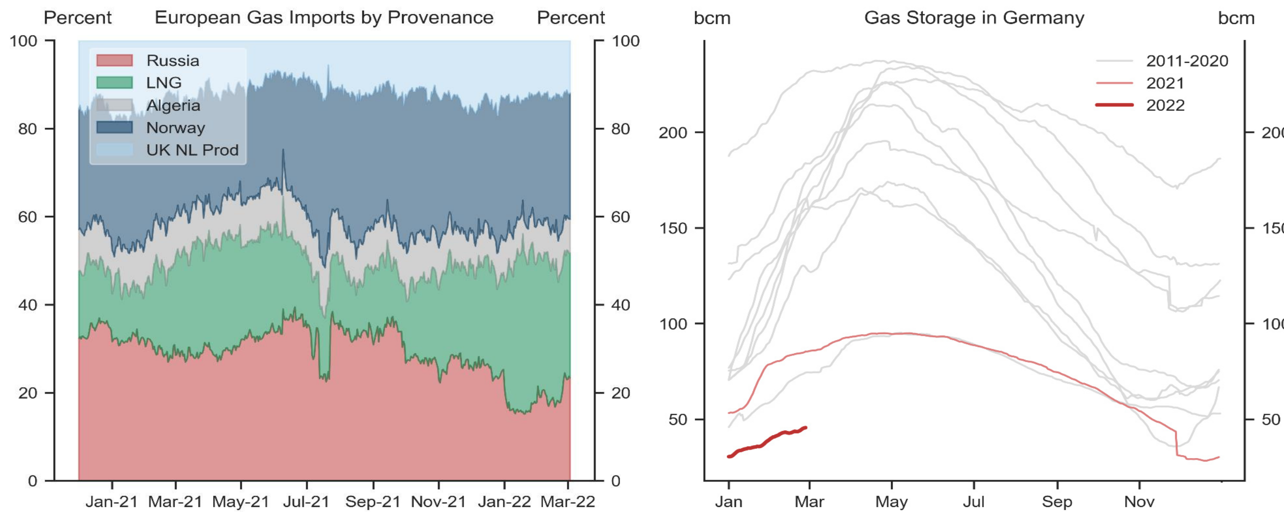
Exhibit 1: The Importance of Gas In The Energy Mix



Source: Goldman Sachs Global Investment Research, Eurostat

While Russia has curtailed its gas flows to North-Western Europe since September last year, flows have not been further reduced since the onset of the war (Exhibit 2, left). In fact, flows have picked up in recent days due to high spot prices. But the risk of further geopolitical escalation paired with close to historically low gas storage levels could lead to production shutdowns, either because of a physical lack of gas or because production is unprofitable given high spot gas prices (Exhibit 2, right). In fact, zinc and aluminium smelting capacity has already been suspended from the end of Q3 2021 to the beginning of this year across a number of countries, including France, Spain, and Germany among others.

Exhibit 2: Flows So Far Not Disrupted, but Storage Levels are Low



Source: Goldman Sachs Global Investment Research, Bloomberg, AGSI

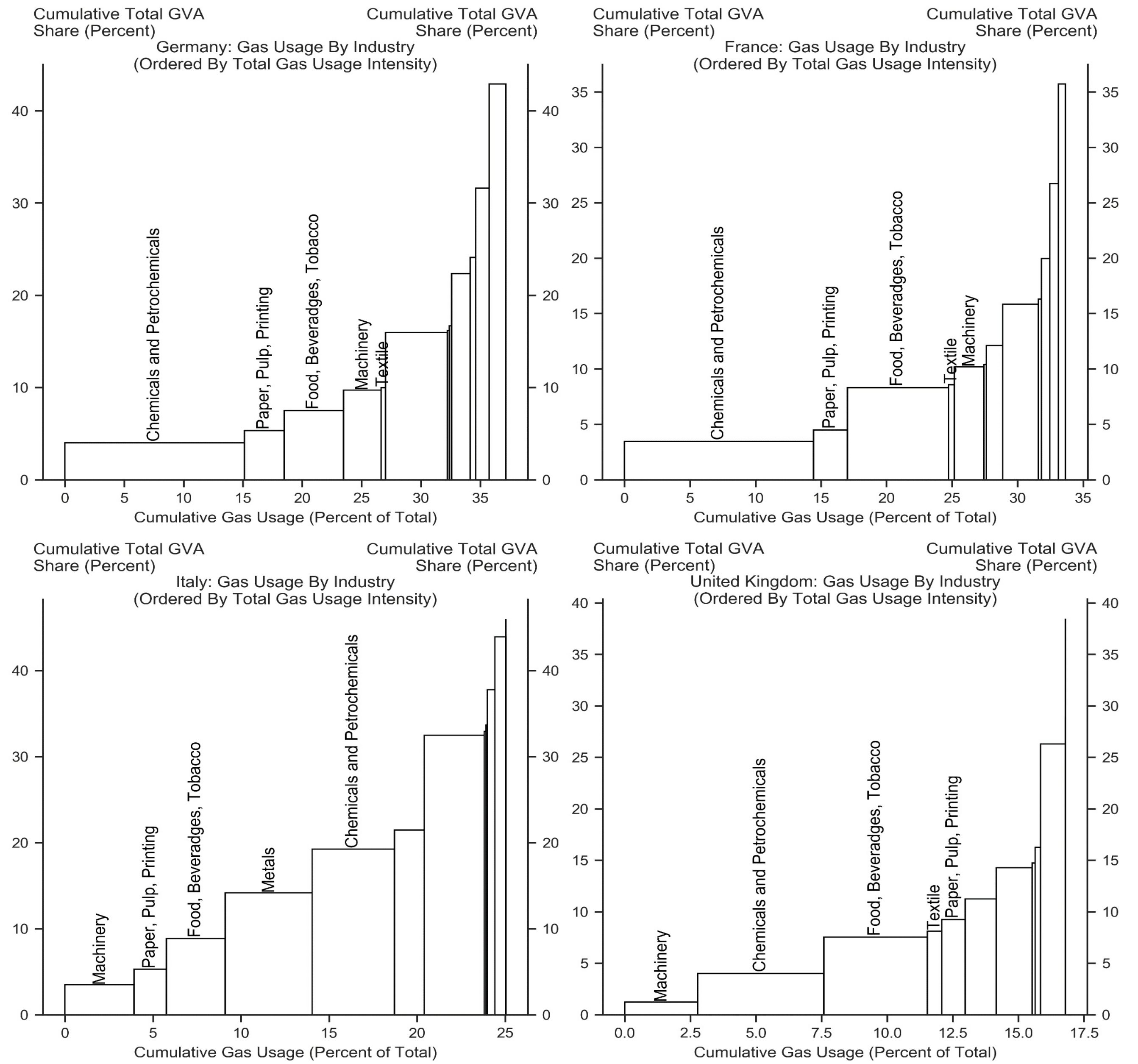
Gauging the Impact on Output

We therefore gauge the impact on European GDP using our commodity team's three scenarios (see here) for gas prices and flows: first, a scenario in which there are no further Russian gas flow disruptions in addition to the curtailment of flows from September last year; second, a scenario with a supply stop of gas flowing through Ukraine for the remainder of the year; and, third, a scenario that sees a full stop of all gas pipeline exports from Russia to North Western Europe for the whole of the year.[1]

We start with a simple quantity exercise to gauge the impact of gas supply disruptions on European output. To map the impact of gas shortages onto GVA, we use our estimates of gas demand reduction with the least GVA impact possible. In Exhibit 3, the x-axis plots the cumulative gas usage, while the y-axis shows the cost in terms of total GVA. We calculate the direct GVA impact using the industry's GVA share, and proxy for the domestic indirect GVA impact using world input-output tables. Further we assume that half of the domestic second-round effect can be mitigated either by changing production processes or by importing missing inputs. We order industries according to their energy intensity such that the highest amount of gas consumption is saved per unit of GVA lost. The results show that in Germany, for example, highly-energy intensive chemical and petrochemical production, as well as paper production, should be the first industries to reduce output in response to gas shortages or required demand destruction.

[1] Our commodities team assumes the probabilities of No further disruption/Ukraine flow disruption/Total Russian flow disruption at 70%/10%/20% for 2Q22, and 90%/4%/6% thereafter.

Exhibit 3: The Cost of Shutting Off Gas

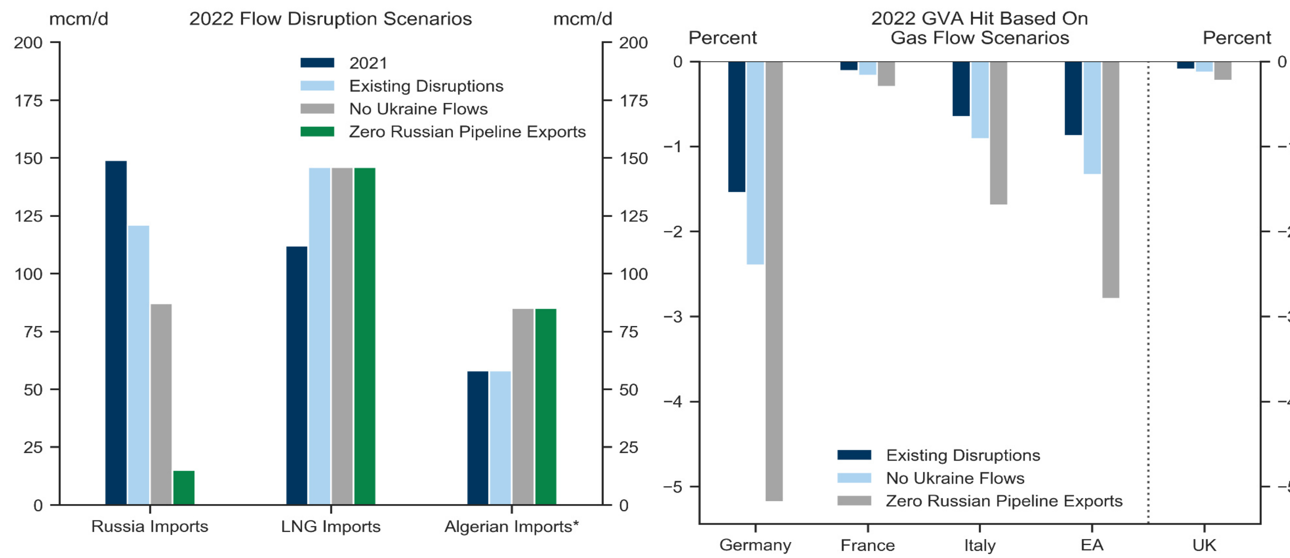


Source: Goldman Sachs Global Investment Research, Haver Analytics

In the first scenario, gas imports from Russia remain subdued at 121 mcm/d, while in the downside scenario of restrictions on the flow of gas through Ukraine would lower this further to 87 mcm/d, and almost no flows in the most severe downside scenario (Exhibit 4, left). To partially offset this, we see scope for LNG imports into Europe to rise from 112 mcm/d to 146 mcm/d across our scenarios given high spot prices, and would look for imports from Algeria into Southern Europe to rise from 58mcm/d to 85 mcm/d in our two downside scenarios.

The right panel of Exhibit 4 maps these gas shortfalls using cost curves into 2022 GDP hits relative to our baseline forecasts. While we acknowledge the high degree of uncertainty around these impacts, we estimate that Euro area wide GDP growth could fall by between 0.9pp to 2.8pp relative to our baseline forecast depending on the scenario. Within the Euro area, the high dependence of Germany on Russian gas means that Germany's output is most exposed (-1.5pp to -5.2pp GDP growth hit), with Italy's high reliance on gas for its energy production also leaving it highly exposed (-0.7pp to -1.7pp GDP growth hit). Outside of the Euro area, the UK is unlikely to face a large exposure due to its small share of Russian imports.

Exhibit 4: The Impact of Flow Disruptions on Output

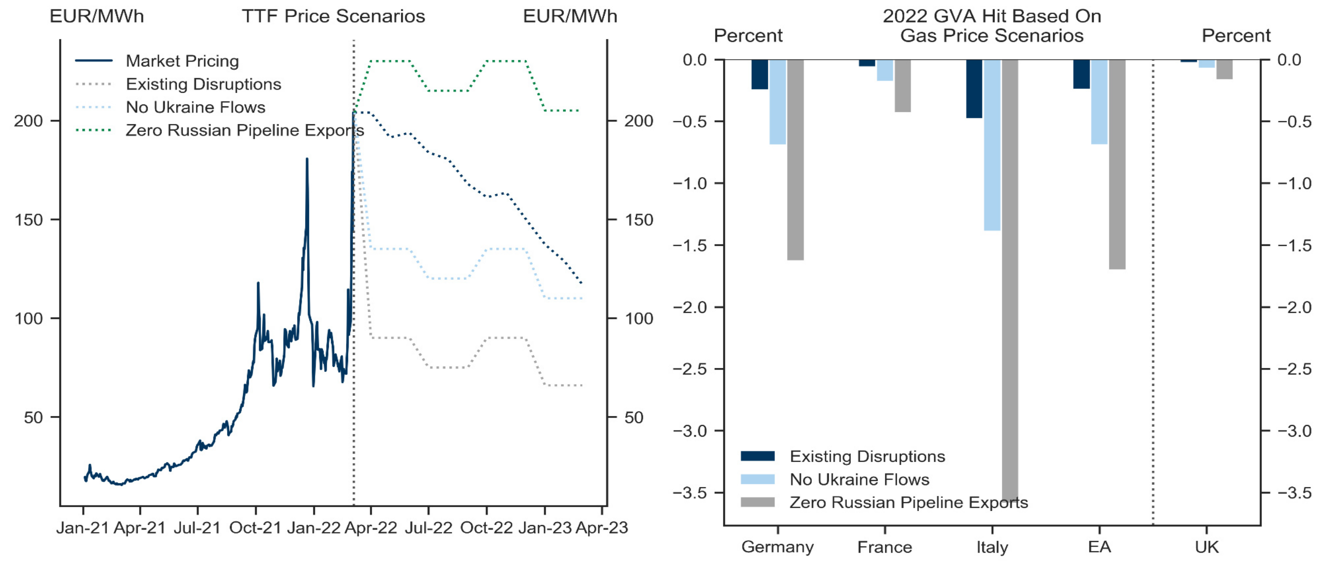


Source: Goldman Sachs Global Investment Research

Purely judging the GVA impact based on gas flows is a crude way of assessing the impact though and subject to a number of caveats, the main of which is that we assume that countries' gas supply is reduced proportionally to their exposure to Russia, not allowing for intra-EU redirecting flows. We therefore consider an alternative estimation method in which we use the price signal to factor in more re-allocation of gas supplies across Europe. We use our commodities team's estimate of a 1 mcm/d demand destruction for every EUR 1.8 gas price increase above EUR 75 to map the price scenarios in the left panel of Exhibit 5 into the GVA impacts in the right panel.

We draw two main conclusions from these additional assumptions: first, the activity hit is smaller in Germany as this analysis assumes that German firms will continue to buy, for example LNG, at higher prices. Second, Italy's reliance on gas in its industrial and electricity production now poses a bigger risk to GVA, in particular in the severe downside scenario (-3.6pp vs -1.7pp GDP growth hit relative to our baseline).

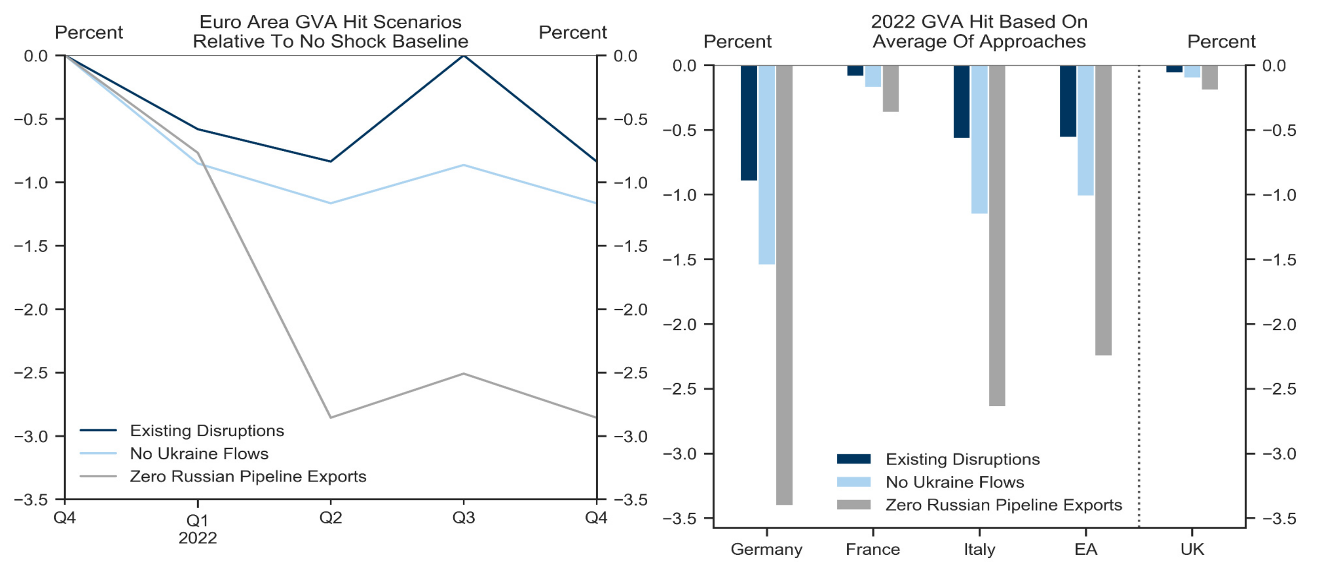
Exhibit 5: A Bigger Hit in Italy, but Smaller Costs Elsewhere



Source: Goldman Sachs Global Investment Research, Bloomberg

Given the uncertainty around both approaches, we also show a model-averaging approach. We see that the summer (when storage needs to be refilled) and winter (when there may not be sufficient gas) are the times of highest risk for European output. For 2022 as a whole, in the scenario with no further supply disruptions, we would expect high gas prices to weigh on Euro area GDP growth by 0.6pp and the UK by 0.1pp relative to our baseline forecast, with a likely bigger impact in Germany (-0.9pp GDP growth hit) (Exhibit 6). These effects are likely to be in addition to any drag from lower consumer spending and tighter financial conditions we have already pencilled in to our forecasts; however, increased fiscal household support and defence spending are likely to mitigate some of the impact.

Exhibit 6: A Sizable Hit to European Output



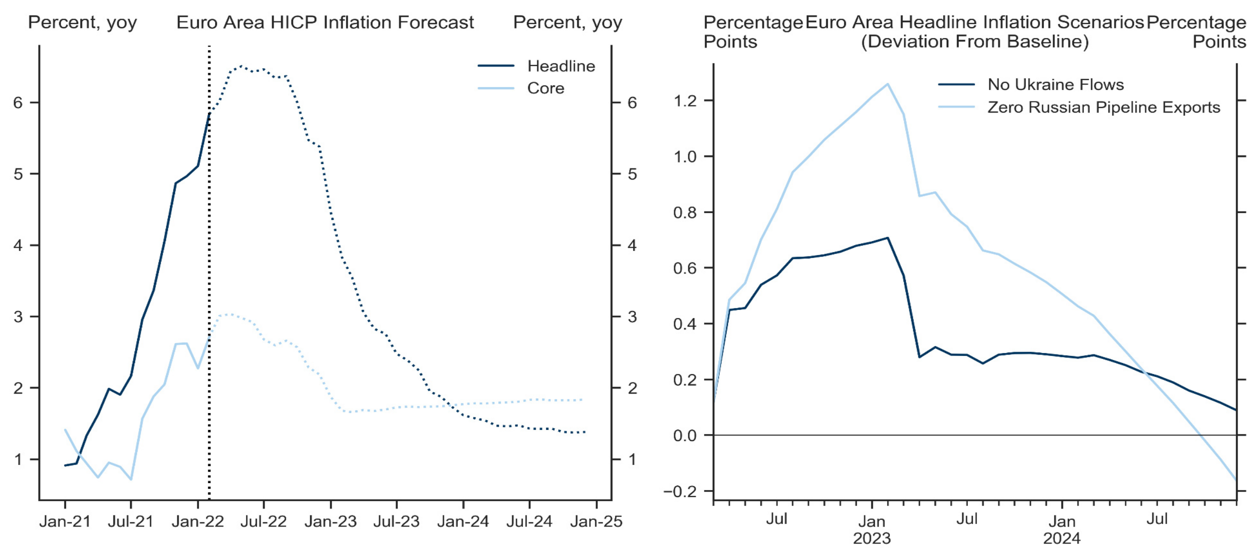
Source: Goldman Sachs Global Investment Research

Gauging the Impact on Inflation

Next we turn to the impact on inflation. The wholesale energy prices assumed in our baseline Euro area forecast are broadly consistent with no further restrictions on Russian gas flows, and for the risk premium to dissipate over coming months (Exhibit 7, left). We currently look for Euro area headline inflation to peak at around 6.5%yoy in the spring, before easing to 5.4%yoy in December.

To gauge the upside risk to this forecast we construct two inflation scenarios consistent with the price scenarios in Exhibit 5. A moderate upside scenario in which gas flows through Ukraine are stopped would add, at its peak in February 2023, about 0.7pp to our headline Euro area inflation forecast (Exhibit 7, right). A more severe scenario in which gas prices rise materially further given a stop in Russian gas pipeline exports could add up to 1.3pp to our peak headline forecast, with possibly material pass-through into core prices. Such a scenario would likely also entail further significant fiscal support to households.

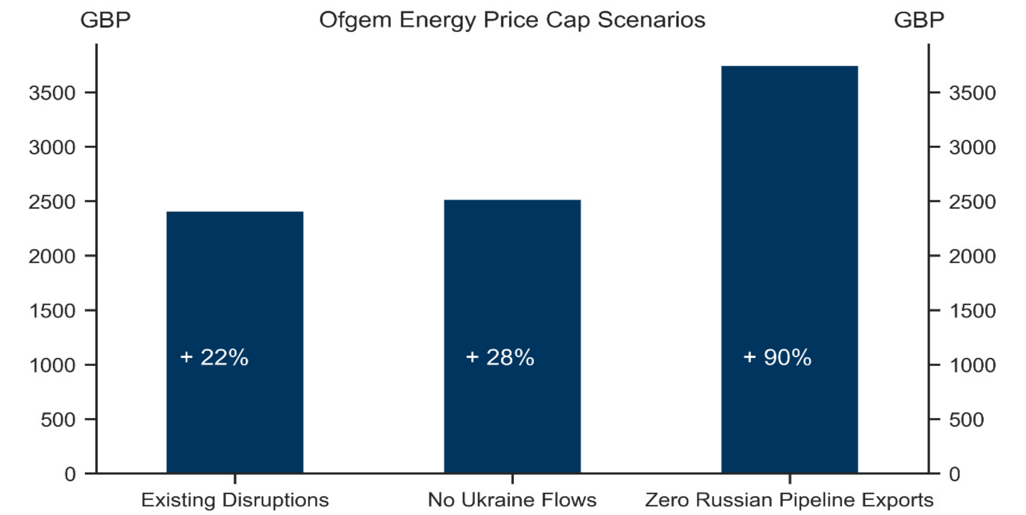
Exhibit 7: Potentially Materially Higher Headline Inflation



Source: Goldman Sachs Global Investment Research, Haver Analytics

Turning to the UK, we map the price scenarios into possible October Ofgem price cap increases. Based on the scenario without further flow disruptions, we would anticipate the cap to rise by 22% relative to April. We estimate that no further gas flowing through Ukraine would increase the price cap by about 28%, while a complete shutdown of Russian pipeline exports could see a 90% increase in the cap. While the UK's direct exposure to Russian gas imports is limited, spillovers through European wholesale energy markets could push up UK inflation materially, with each 10% increase in the price cap adding about 35bp to the CPI. We therefore see two-sided risks around our current assumption of a 55% increase in the price cap.

Exhibit 8: Another Sharp October Price Cap Increase May Be on the Horizon



Source: Goldman Sachs Global Investment Research

While we expect that the effects of current supply disruptions are likely to weigh only moderately on 2022 GDP and push inflation somewhat higher, we see risks for the European economy firmly skewed to the downside given the risk of energy shortages. Such an outcome would also likely require significant fiscal support, and we would expect a later ECB exit if these scenarios were to crystallise.

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Disclosure Appendix

Reg AC

We, Sven Jari Stehn, Steffan Ball, Alain Durre, Soeren Radde, Christian Schnittker, Filippo Taddei and Ibrahim Quadri, hereby certify that all of the views expressed in this report accurately reflect our personal views, which have not been influenced by considerations of the firm's business or client relationships.

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