

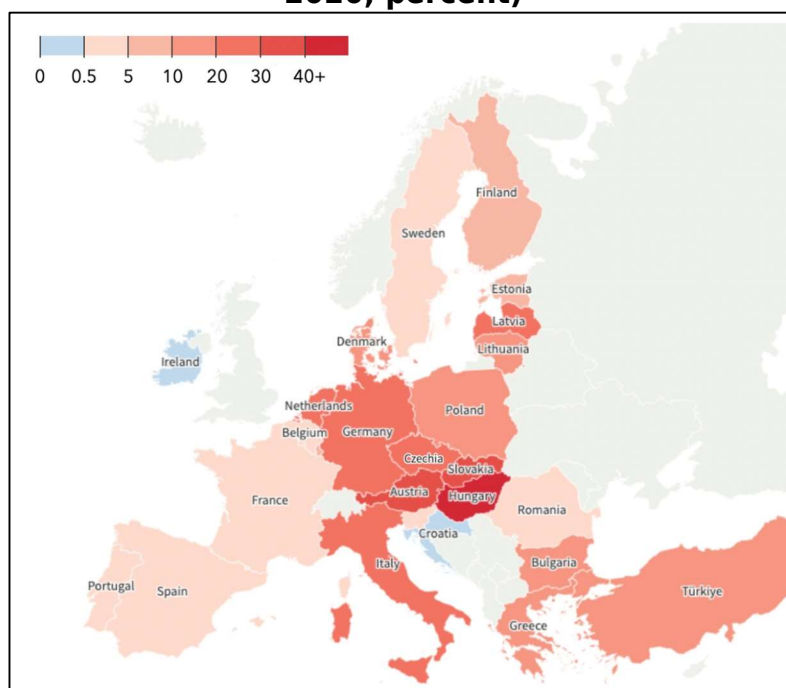
Natural Gas in Europe: The Potential Impact of Disruptions to Supply

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Russia's invasion of Ukraine has placed **natural gas supply in Europe at risk**. Russia has been Europe's largest supplier of natural gas and distribution networks are geared towards Russian supply. Russian pipeline flows to Europe have been dropping since the second half of 2021 and in early August stood around 70 percent below the level from August 2021. The prospect of an unprecedented total shutoff is fueling concern about gas shortages, still higher prices, and economic impacts.

In an [International Monetary Fund Working Paper](#) and related [blog post](#) we show that in some of the most-affected countries in Central and Eastern Europe—Hungary, the Slovak Republic and the Czech Republic—there is a risk of shortages of as much as 40 percent of gas consumption and of gross domestic product shrinking by up to 6 percent. **The impacts, however, could be mitigated** by securing alternative supplies and energy sources, easing infrastructure bottlenecks, encouraging energy savings while protecting vulnerable households, and expanding solidarity agreements to share gas across countries.

Russian gas dependence (Russian gas as a share of total energy consumption, 2020, percent)



Source: IMF Staff Calculation

What determines exposure?

Dependence on Russia for gas, and other energy sources, varies widely by country. European infrastructure and global supply have coped, so far, with the drop in Russian gas deliveries. Total **gas consumption** in the first quarter of 2022 was **down 9 percent**

from a year earlier, and alternative supplies are being tapped, especially **LNG from global markets**. Our work suggests that a reduction of up to 70 percent in Russian gas could be managed in the short term by accessing alternative supplies and energy sources and given reduced demand from previously high prices.

This explains why some countries have been able to unilaterally halt Russian imports. However, **diversification would be much harder in a total shutoff**. Bottlenecks could reduce the ability to re-route gas within Europe because of insufficient import capacity or transmission constraints. These factors could lead to shortages of 15 percent to 40 percent of annual consumption in some countries in Central and Eastern Europe.

Economic impact

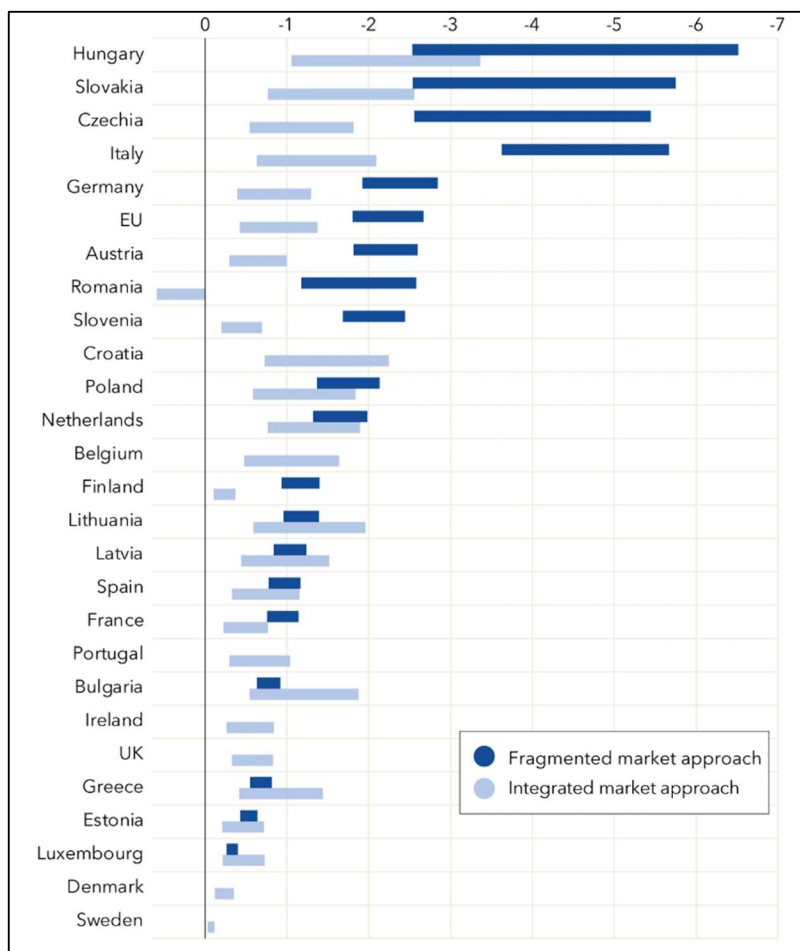
We gauge impacts two ways. One is an **integrated-market approach** that assumes gas can get where it is needed, and prices adjust. Another is a **fragmented-market approach** that is best used when the gas cannot go where needed no matter how much prices rise. However, estimation is complicated by the fact that the hit to the European economy is already happening.

Using the integrated-market approach—as the market remains so—to estimate the direct impact to date suggests that it may have amounted to a 0.2 percent reduction for European Union economic activity in the first half of 2022.

We derive a broad range of estimates of impact over the **next 12 months**. Reflecting the unprecedented nature of a full Russian gas shut-off, the right modeling assumptions are highly uncertain and vary between countries.

If EU markets remain integrated both internally and with the rest of the world, our integrated-market approach suggests that the global LNG market would help buffer economic impacts. That is because reduced consumption is distributed across all countries connected to the global market. At the extreme, assuming no LNG support, the impact is magnified: soaring gas prices would have to work by depressing consumption only in the EU

Output losses. A Russian gas supply shut-off has varying impacts across Europe (percent of GDP)



Source: IMF Staff Calculation

If physical constraints impede gas flows, the fragmented market approach suggests that the **negative impact on economic output** would be especially significant, as much as **6 percent** for some countries in **Central and Eastern Europe** where the intensity of Russian gas use is high and alternative supplies are scarce, notably Hungary, the Slovak Republic and the Czech Republic. **Italy** would also face significant impacts due to its high reliance on gas in electricity production.

The effects on **Austria and Germany** would be less severe but still significant, depending on the availability of alternative sources and the ability to lower household gas consumption. Economic impacts would be moderate, possibly under 1 percent, for other countries with sufficient access to international LNG markets.

Addressing challenges

Our research shows that **the economic fallout** from a Russian gas **shutoff can be partially mitigated**. Policy makers at the EU and national level have been moving swiftly in addressing the significant challenge. Beyond measures already taken, further action should focus on risk mitigation and crisis preparedness.

Governments must further boost efforts to secure supplies from global LNG markets and alternative sources, continue to alleviate infrastructure bottlenecks to import and distribute gas, plan to share supplies in an emergency across the EU, act decisively to

encourage energy savings while protecting vulnerable households, and prepare smart gas rationing programs.

This is a moment for Europe to build upon the decisive action and solidarity displayed during the pandemic to address the challenging moment it faces today.