

FAQ: European Independence From Russian Natural Gas

Why must Europe reduce and ideally eliminate reliance on natural gas imports from Russia?

- The European Commission's REPowerEU plan calls for a two-thirds reduction in Russian gas imports this year. This would leave Europe critically vulnerable to a sudden cessation of gas flows, particularly in winter months.
- European countries paid Russia more than \$70 billion for fossil fuels in the first two months after the invasion of Ukraine, including \$31 billion for natural gas. This far exceeds the total aid provided to Ukraine since the war began.

How much natural gas does Europe import from Russia?

- Roughly 140 billion cubic meters per year (bcm/yr) via pipelines and 15 bcm/yr via liquefied natural gas (LNG).

Is elimination of European gas imports from Russia feasible?

- Yes. Analysis and modeling of European gas and electricity systems identifies several feasible paths for Europe to eliminate imports of Russian natural gas by October 2022.

What measures can Europe employ to eliminate reliance on Russian gas this year?

- Increasing pipeline gas and LNG imports from alternative sources.
- Reducing gas demand in heating and industry.
- Reducing gas-fired electricity generation by temporarily increasing coal use and reducing electricity demand while accelerating renewable energy deployment.
- Recalibrating gas storage targets to reflect reduced natural gas demand under this scenario.

What role will alternative sources play in eliminating gas imports from Russia?

- Non-Russian pipeline imports should increase by 24 bcm/yr over the next two years.
- Net LNG imports need to increase by roughly 17 bcm/yr. An additional 15 bcm/yr is needed to replace current Russian LNG imports, for a total need for about 32 bcm/yr of alternative LNG supplies.

How much end-use demand reduction is required to eliminate European reliance on Russian gas?

- We model gas demand reductions of 11% in industrial applications based on observed reductions, decreasing to 5% in the second year, 8% in residential and commercial heating, and 4% in combined heat and power plants, equal to 6% of total EU gas use (slightly above the REPowerEU plans for a 5% reduction via behavioral measures).
- Feasible alternative pathways exist with higher or lower levels of demand reduction.

How much must natural gas use be reduced in Europe's electricity sector?

- Roughly 60 bcm/yr, which can be achieved through various combinations of electricity demand reduction, renewable energy deployment, and substitution by coal power. Less severe measures are enabled by greater gas demand reductions elsewhere.
- Maximum achievable gas use reduction in Europe's electricity sector is roughly 70 bcm/yr.

How much must Europe increase its coal consumption in this scenario?

- European hard coal consumption increases by 39 to 61 MT during the 2022/2023 heating year (April 2022-March 2023) compared to the year prior and 8 to 47 MT during the 2023/2024 heating year.
- Coal consumption can be reduced to 2021 levels or below by 2024 through accelerated renewable electricity deployment, restoration of French nuclear fleet availability, and extension of nuclear plant lifetimes.

How can Europe meet this demand for additional coal?

- European lignite production can likely increase by 30 MT in 2022, the equivalent of about 10 MT of hard coal.
- Europe would need 89-111 MT of additional hard coal imports in 2022/2023 heating year to displace both gas and hard coal imports from Russia, which stood at 50 MT/yr in 2021.
- Assuming Russia's current exports to Europe are purchased elsewhere on the global market, meeting Europe's needs will require an increase of 29-51 MT/yr of new supplies delivered to the global seaborne coal market, an increase of about 4-10% in the global thermal coal trade.
- The United States could supply ~30-55 MT/yr by drawing down ample stocks, increasing domestic production, and reducing coal-fired generation in the US power sector.

What is the emissions impact of expanding coal generation and eliminating Russian gas?

- Territorial greenhouse gas emissions would change by -1.2% to -3.4% relative to 2021 levels in 2022/2023 (-49 to -137 MTCO_{2e}/yr) and by -4.4% to -7.3% relative to 2021 levels in 2023/2024 (-182 to -299 MTCO_{2e}/yr), depending on the level of coal use and rate of renewable deployment.
- Total upstream emissions decrease by an additional 95 MTCO_{2e}/yr in 2022/2023 and 108 MTCO_{2e}/yr in 2023/2024.