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Russian Gas Cuts Threaten World's Largest Chemicals Hub

Chemical sector's reliance on natural gas makes it particularly vulnerable to further shortfalls



By *Georgi Kantchev* [Follow](#)

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LUDWIGSHAFEN, Germany—For years, BASF SE, BASFY -3.29% ▼ one of the world's largest chemicals companies, built its business model around cheap and plentiful Russian natural gas, which it uses to generate power and as feedstock for products that make it into toothpaste, medicines and cars.

Today, dwindling Russian gas supplies are proving a threat to the company's vast manufacturing hub here—the world's largest integrated chemical complex spanning some 200 plants. Earlier this month, Russia started throttling back its

supply of gas to Germany and other European countries. In response, company executives are doing what was unthinkable just a few months ago: considering how to potentially shut down the complex if gas supplies fall further.



The threat isn't just to BASF and its 39,000 employees in Germany. Because BASF and other chemicals companies sit at the beginning of most industrial supply chains, their disruption would reverberate well beyond the sector, threatening Europe's economy at a time of high inflation and slowing growth. A throttling of BASF's ammonia output, a key ingredient in fertilizers, could exacerbate the world's growing food crisis, analysts say.

"Stopping production here would be a mammoth task," Peter Westerheide, BASF's chief economist, said from an office overlooking Ludwigshafen's dense matrix of pipelines, plants and railroads. "We've never faced such a situation before," he said. "It's difficult to imagine."

Germany's dependence on Russian gas has risen after successive governments moved to close the country's last nuclear power plants and to phase out coal, leaving only gas and renewable energies as alternatives. Many homes in Germany use gas for heating and the country is home to the biggest manufacturing sector in Europe, a voracious consumer of the fuel.

Last Thursday, Berlin triggered the second of a three-step emergency gas plan that, in its last step, could cut off gas supplies to some companies. The move came after Russia reduced deliveries to Germany via the Nord Stream pipeline to 40% of its capacity. Moscow blamed the shortfall on missing turbine parts due to sanctions. German officials called it an economic attack. Germany currently receives about 35% of its gas imports from Russia, from around 55% before the Ukraine war.

Chemicals companies such as BASF are more vulnerable than other industrial players because natural gas is critical for most of their processes. Some 60% of the gas BASF consumes in Europe is used for power and steam generation. The other 40% is used as a feedstock, or raw material for its products.

At BASF's Ludwigshafen site—a city within a city with over 60 miles of roads, some eight restaurants and a wine cellar—natural gas is fed into an intricate system of pipes and spigots to reach plants making ammonia and acetylene, a compound used in plastics and pharmaceuticals. The site is responsible for as much as 4% of German gas demand.

“To put it plainly: There is no short-term solution to replace natural gas from Russia,” BASF Chief Executive Martin Brudermüller said in April.



At the heart of the Ludwigshafen operation are two steam crackers, one of which takes up an area the size of 13 soccer fields. These large furnaces—which are typically operated with natural gas—“crack” naphtha, a petroleum product, into the basic components for subsequent production.

Managers figure that if gas supply stays above 50% of Ludwigshafen’s maximum demand, they can continue to operate by reducing the load and using substitutes. If gas supply falls significantly below that over a sustained period, they would have to stop production, the company said. The threat of gas rationing is growing and Russia is likely to continue to curtail gas deliveries, German officials and analysts say.

The site employs around a third of BASF’s total workforce. While chemical plants stop production for scheduled and officially required maintenance, an immediate shutdown of the whole complex can lead to critical plant damages and significant safety risks and the company needs time to ensure a safe shutdown of the plants.

“Everything is interconnected and depends on other parts of the complex,” Mr. Westerheide said. “Costs are high to stop and start. This is an extreme scenario that we very much like to avoid.”

With gas now becoming rarer and more expensive, BASF is racing to find alternatives—and finding that few exist in the short term.

Germany’s VCI chemical industry association said the chemicals sector, the country’s largest industrial gas consumer, requires around 135 terawatt hours of gas a year. The industry can save only two to three terawatt hours by using alternative fuels, VCI said.

Longer term, BASF is working on reducing its dependence on fossil fuels by increasing energy efficiency and switching to renewables in the power supply. Last year, it invested in an offshore wind park and signed long-term supply contracts for green electricity. But while replacing gas-powered electricity is

technically possible, the renewables supply isn't yet enough to meet demand, analysts say.

When it comes to feedstock, BASF has pilot projects for chemicals recycling and increasingly uses biofuel feedstocks, including biomethane. However, these approaches won't be able to substitute fossil fuels at large scale soon, analysts say.

"In the short and medium term, BASF would still need gas," said Arne Rautenberg, a fund manager at Union Investment, an investor in BASF. "There really is no way around it."

Amid its European challenges, the company has been increasingly looking to China. It is already building a \$10 billion production site in Zhanjiang, southern China. The company says that China, the largest and fastest-growing chemicals market in the world, is central to its growth strategy. High energy costs in Europe and the economic war with Russia make this focus more attractive.

Pivoting to China, however, will also take time—the company currently derives around 14% of its revenue from China, according to FactSet, compared with around 40% from Europe—and bears political risks.

The German government has embarked on a broad rethink of its relationship with China amid concern in the West about Beijing's authoritarian drift at home and its more aggressive posture abroad. That shift, aimed at reducing Germany's strategic and economic dependence on Beijing, has accelerated after Russia's invasion of Ukraine, which China has refused to condemn.

"You have to be there where the market is, and China is a huge chemicals market," said Sinischa Horvat, chairman of BASF's works council. "But you also have to consider: Am I making myself even more dependent on something or am I in a healthy balance? That will be the challenge for the future."

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