



Local Disruptions with Global Implications: How the War Affects the Chemicals Sector

Europe's chemicals sector is feeling the most immediate effects of war in Ukraine, but producers in other regions must also understand the implications for their markets and supply chains.

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At a Glance

- ▶ The effects of the conflict in Ukraine on the chemicals sector remain highly dynamic, with varying levels of disruption by region and chemical chain.
- ▶ Chemical companies are focusing on the effects across inputs, operations, and their most important end markets, to assess specific implications on volumes and margins.
- ▶ By considering a range of market scenarios, they can continue to make plans amid uncertainty in oil and gas prices, trade dynamics, supply chains, and end markets.

For chemical producers, the conflict in Ukraine has initiated another period of disruption and uncertainty, challenging post-Covid economic recovery, impacting global supply chains, and adding further stress on the already fragile geopolitical situation.

The war's effects differ across regions and industry sectors. The European energy and commodity markets are seeing the most initial disruption, given their dependence on supply from Russia and Ukraine. This directly affects the energy-intense base chemicals sector in Europe. Other regions feel more indirect effects from the war and may still be affected more from the disruptions of the pandemic. This is especially true in China, where resurgence of the virus is affecting local production.

Short-term effects

Assessing the impact on chemical companies starts with getting a granular understanding of the effects on inputs, operations, and end markets.

Inputs. Major chemical inputs affected by the conflict include feedstocks (oil and gas, and certain metals and minerals used, for example, for process catalysts) as well as the energy required to produce heat and steam. Disruptions in gas supply and high prices are already having a big effect on Europe's chemical industry. This is because of the dependence on gas supply from Russia, the limitations in channeling alternative gas flows given the infrastructure required, and the relevance of gas as a feedstock and as an energy source. Further gas supply disruptions could result in plant shutdowns—for example, in Germany, which is a large customer of gas from Russia. As the German chemical industry represents 25% of European chemicals output, major shutdowns will create imbalances across many chemical chains, with global impacts.

Chemicals segments such as ammonia production and petrochemical building blocks are, for now, most affected. Yara was among the first producers to announce capacity closure due to soaring feedstock and energy costs, and more producers are likely to follow.

These disruptions have already increased chemical costs. As oil and gas prices have risen, global production costs have also gone up. This is particularly true in Europe, where price increases for natural gas and energy were higher, giving producers in North America and the Middle East a additional margin advantage.

Longer-term cost curve disruptions will depend on how oil and gas prices will evolve under different industry scenarios, especially if these result in any structural changes in the oil-to-gas price ratio and the resulting feedstock costs (see the Bain Brief “How Energy and Natural Resource Companies Are Responding to the Crisis in Ukraine”). For example, when rising demand for gas increases the price for natural gas liquids (NGLs) as petrochemical feedstock, this reduces the cost advantage for gas-based producers. This may lead producers who have the flexibility to do so to change their feedstock to naphtha. This could also increase C3+ supply volumes, such as propylene and its derivatives, which are produced as by-products. This will affect prices, given changes in the supply-demand balance for these products.

Operations. The war’s effects on operations and supply chains come on top of the disruptions already caused by the Covid pandemic, which much of the world is still struggling to recover from, adding complexity to global supply chains and making it even harder for companies to adjust.

For example, lockdowns in China and potential Covid measures elsewhere continue to strain workforces in operations and logistics globally. In addition, the war affects the availability of the skilled workforce from Central and Eastern Europe and Russia, who are critical resources in European manufacturing and in global shipping crews.

Production and logistics interruptions add uncertainty to the available supply in the market, making it harder to predict and manage inventories along value chains. Also, as trade slows, supply and demand become harder to balance, creating regional price differences and the opportunity for arbitrage. However, for exporting regions, such as the US Gulf Coast for polymers, logistics constraints limit their potential

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to ship products overseas and take advantage of these arbitrage opportunities, which may lead to lower utilization and potentially even oversupply in domestic markets when producers do not adjust output levels.

Commercial operations are also affected. As the availability and pricing of inputs are uncertain, locking in customer contracts introduces an additional margin risk. Some protection against this risk can be provided by using pricing indices where available; however, these generally do not apply to specialty or value-added chemicals. One way to address pricing for these chemicals is by extending a formula-based pricing approach to value pricing, using a fixed contribution for the value-add, which gets added to the variable input costs.

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End markets. Given the pivotal role of the chemicals sector as a supplier to virtually all end markets, broad economic disruptions cascade back upstream to chemicals, affecting chemicals segments that may not be directly affected by the conflict.

For example, automotive manufacturing will experience direct supply limitations due to its dependence on Russia for certain metals. But the sector is also affected by disruptions in supply—for example, the disruption in the production of wiring harnesses in Ukraine. Together, these effects could reduce automotive production levels, with 1 to 1.5 million units lost to global light-vehicle production in 2022, or more than double this amount in a more pessimistic scenario. This will in turn reduce demand for many chemical categories such as polypropylene, polycarbonates, battery materials, catalysts, coatings, and others.

On the other hand, higher oil prices typically spur investments into oil production, increasing the demand for chemicals required in the sector, such as surfactants for enhanced oil recovery. End markets such as construction will see a mix of effects, as rising building material costs will slow down residential and some industrial investments. At the same time, infrastructure investments may increase due to the need to build out alternative energy assets, and as a result of public investments that may happen in response to recessionary pressure.

Assessing effects on inputs, operations, and end markets can help chemical companies understand which business areas are most affected, and should help identify key risks and opportunities.

Broader economic changes, and recessions in particular, tend to have an immediate effect on chemical production as consumption slows down. Soaring energy prices in Europe are likely to create recessionary effects there, and also in markets such as Brazil, where the increase in oil prices since the end of 2020 has already increased inflation. Restoration patterns will vary, depending on end markets, with essential sectors being least affected, and durable and luxury goods typically seeing a slower recovery pattern.

These end market disruptions are especially critical given the supply chain disruptions, which limit the ability to mitigate supply disruptions in end markets. Therefore, the exact impact of these demand disruptions is expected to be very localized in how they affect chemical producers.

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Longer-term effects

While it's unclear how far-reaching the war's implications will be, we expect some lasting changes that may build on trends already underway before the conflict.

For example, early signs from the European Union and some member countries indicate this could accelerate the shift to renewable energy, to reduce dependence on Russia for energy supply. This will increase demand for chemicals needed to enable the energy transition. It could also create accelerated opportunities in hydrogen, which could result in development of new capacity in the Middle East, Africa, and other low-cost production regions.

The conflict is also likely to put further tension on geopolitics. China may accelerate its "China for China" efforts to reduce dependency on global trade partners. This could spur investments in clean coal production and other enabling technologies for the energy transition (for example, battery materials and solar panels). Multinational companies may

look to establish stronger regional hubs that operate and invest more autonomously while still retaining core global capabilities, for example, in operations or research.

Further separation of global trade into separate blocks could also imply rerouting of existing flows, and result in reshoring of strategic sectors, for example, to the United States or other regions that could become new manufacturing hubs. For critical sectors, vertical integration is likely to secure supply. In the battery chain, several companies have announced investments into localized and integrated battery supply chains—for example, Tesla in Germany, CATL in partnership with Indonesia, and LG Energy Solution in partnership with Stellantis in Canada.

Current events also put pressure on the cost competitiveness of European petrochemicals assets, and to a lesser extent other global naphtha-based petrochemicals. For chemical producers with assets in Europe, it will be important to focus on quality of product and service, to differentiate from production from out of region. At the same time, the presence of assets to handle heavier feedstocks may also provide opportunities to accelerate investments, for example, into chemical recycling, to further build out the leading position of Europe in circular polymers. The urgency of making this shift will be determined by the level of disruption in global oil and gas markets, and how this impacts the oil-to-gas price ratio and therefore relative competitiveness of the different regions.

How these longer-term effects will play out will mostly be determined by how macro trends evolve and affect chemical value chains. Across sectors, Bain's thinking is guided by three plausible scenarios that provide direction on how the current conflict could affect geopolitics, resources, energy, and capital markets. Monitoring events to understand how scenarios will play out can help chemical companies assess how they are likely to be affected.

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Taking action

Navigating the crisis will require chemical producers to take action to mitigate risks and understand opportunities, depending on their company's strengths and exposure to different sectors and regions. We see three main actions.

- Deeply understand specific market dynamics and potential implications, recognizing headwinds and opportunities at a granular level across the asset base.
- Tightly manage and align operations during the current uncertainty and disruptions, by securing supply and production, optimizing supply chains and inventory, and managing pricing volatility upstream and downstream.
- Keep a close eye on macro scenarios and potential disruptive changes due to evolving customer demands, regulations, and other government interventions.

Over the longer term, chemical companies should also prepare to reposition themselves as markets evolve due to the current conflict and other ongoing trends. These dynamics will create new leaders and laggards in the sector. Successful companies will combine defensive measures with forward-looking strategies that create new growth and value in attractive markets.

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