

Chemical Supply Chain Insight: 5 Steps to Becoming More Resilient

An in-depth look at the interconnected nature of global supply chains and how companies can leverage market insight to effectively sense and respond to change

What you need to know:

- Chemicals are the building blocks for numerous industries and interdependencies exist between upstream and downstream supply chains that can significantly impact one another.
- The chemical industry is also susceptible to volatility from influences such as macroeconomic shocks, geopolitical concerns, market gyrations, and energy prices.
- Political unrest, weather disturbances, and plant outages are a few recent examples of real disruptions to the continuity and profitability of chemical-dependent supply chain operations.
- Armed with the right mix of market insight, industry knowledge, and commodity information, organizations can more effectively sense and respond to changes in the landscape before they occur and faster than others.

All Supply Chains Rely on Chemicals

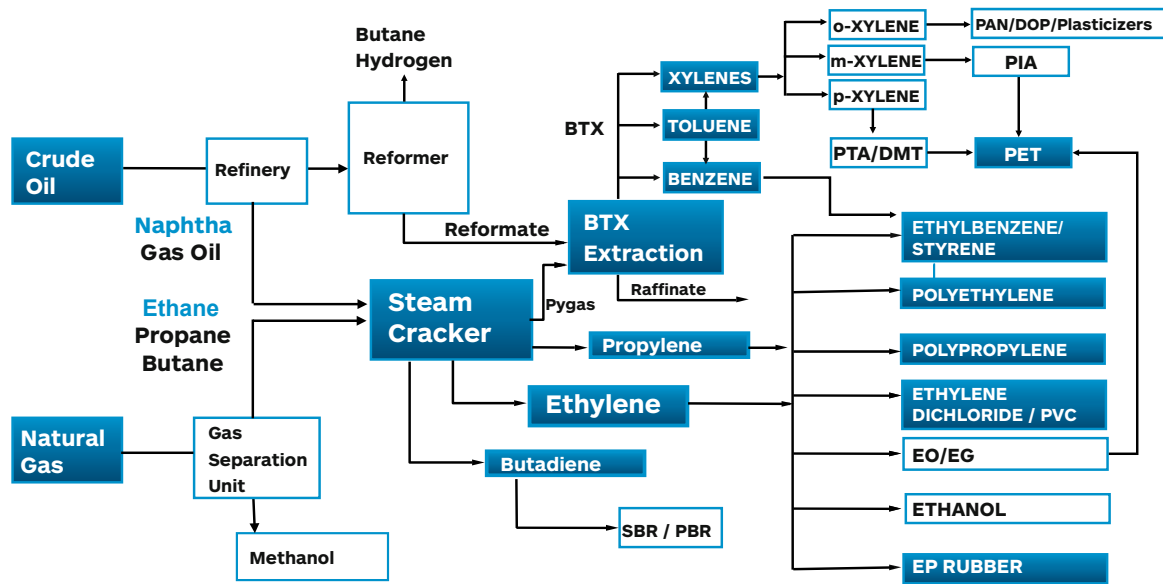
The chemicals and plastics markets have long been susceptible to volatility in crude oil and natural gas prices, market gyrations, global economic swings, and fluctuating demand for its products. These and other factors—such as political turmoil, natural disasters, weather events, or unexpected plant outages—can negatively impact an organizations' ability to operate profitably and grow at a desired rate.

“All of these dynamics are constantly churning on a daily basis,” says Howard Rappaport, senior director of chemicals at IHS, “and impacting not only the price of raw materials, but also availability on the supply/demand side of the equation.”

Chemical firms are also vulnerable to the interconnectedness of the industries that they rely on for raw materials, that they sell into and that they partner with. Here's one example of this interdependency between chemicals and adjacent players in the supply chain:

- The chemical industry relies heavily on the energy sector both as a source of raw materials and for the resources to operate chemical and plastic production facilities.
- Oil and gas are converted to petrochemicals, which in turn become the building blocks for other intermediate products like adhesives, plastics, and other chemical derivatives.
- After going to a convertor or fabricator, those derivatives become finished goods that are transmitted to consumers via a retail distribution channel.

Connection Between Energy and the Chemical Industry



As you can see from this example, chemical supply chains converge across many different industries and impact numerous organizations and consumers. To operate at optimal levels during good and bad times, these supply chains must be built on industry knowledge and market insights that enable effective decision making. This decision-making is critical to ensure that the companies involved can capture opportunities, optimize their supply and demand networks, and overcome or mitigate future risk.

Supply Chain Disruption—Not If, But When

Plant explosions, weather-related catastrophes, and political unrest can all take their toll on profitability goals. In 2013, during a fire and explosion at its ethylene plant, Williams, a Geismar, La.-based owner of interstate gas pipeline and midstream operations, immediately witnessed a ripple effect throughout the industry. At the time of the explosion, the company was producing 2.5% of the U.S.’ total ethylene capacity and about 1.5% of the nation’s propylene. Louisiana was 2 million tons short of ethylene at the time of the explosion, so the event further exacerbated that challenge. Because ethylene is a critical component in several key plastic products, the disruptive event at Williams impacted the production of ethylene dichloride, ethylene oxide, and other downstream

derivative products. Because Williams was in the midst of expanding its facility and increasing capacity at the site, the fire and explosion created an uncertain environment for the proposed expansion. Finally, the event had a moderate impact on spot prices for both ethylene and propylene in the U.S. market.

With the right mix of industry knowledge and foresight into market trends, companies that have a dependency on the chemical industry can effectively sense and respond to change better than others.

“Everything from production levels to interdependent relationships to downstream products are very important considerations from a ground-level perspective,” says Rappaport. “At IHS, we track this to make sure our clients are well informed and able to effectively plan ahead for events like this fire and explosion.”

In some cases, the disruptive events involve outside forces. Every year between June and November, for example, the Gulf Coast of the U.S. becomes a hurricane zone. With a high concentration of natural gas and oil drilling in Texas, Louisiana, and adjacent states, drilling platforms and rig operations – and the associated downstream chemical and related derivatives – can quickly find themselves targeted by these destructive storms. “We all know that it’s impossible to control or manage the weather,” says

Rappaport, “but it’s certainly something that has elements of predictability, probability, or disruptive implications that we can monitor very closely to learn of any potential impact on supply chain operations.”

Using market insights, companies no longer have to fly blind and be susceptible to market gyrations and swings—even when the culprit is seemingly abstract influences such as geopolitical instability surrounding oil-producing countries. For instance, earlier in 2013, the prospect of political change in Egypt witnessed oil prices jumping dramatically by 2-3 percent within a few days span. Such significant price jumps in crude oil—a key building block for the chemical industry and related products – negatively impacts a wide range of downstream products. Usually temporary, these situations can also sustain themselves for long periods of time and have “a critical impact on the cost structure in the supply chain,” says Rappaport. “Whether you’re a global or regional player in today’s markets, you need to have a handle on events that will impact your business.”

Resiliency, the Key to Managing Risk

As you’ve read in this report, it’s not a matter of *if* disruptive events will impact a chemical company’s operations and profitability; it’s a matter of *when* it will happen. “Using market insights and analysis, companies who depend on chemical supply chains can not only improve their bottom line, but also implement sense-and-respond strategies to become more agile—helping to lessen the trickle-down effect of market variability or the acuteness of impacts from major shocks to the system,” says Rappaport. “This foresight enables companies to become more resilient and capture market opportunities, optimize supply and demand networks, and overcome and mitigate future risk.”

Using market insight, chemical companies and their customers can map out their materials, suppliers, and/or supply chain operations obtain firsthand knowledge of macroeconomics, markets, company/ suppliers, countries, materials, and other influences to monitor and manage their performance.

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5 Steps to Resilience

By taking these key steps, firms can examine potentially disruptive events, determine how they will impact a company’s operations, and then take the necessary actions to reduce or eliminate those impacts:

- **SUPPLY CHAIN DEPENDENCIES**

Map the upstream and downstream dependencies of the supply chain to critical commodities such as chemicals, plastics, and their suppliers

- **COST STRUCTURE**

Understand the cost structure of these materials and how the materials’ supply chains are linked to other industries (i.e. energy) and external influences (i.e. economics, geopolitics, infrastructure, trade flows)

- **MARKET INTELLIGENCE**

Obtain market data, industry knowledge, commodity information, and analytical tools to monitor the historical performance, current conditions, and future outlook for each of these dynamic, interdependent influences

- **UNDERSTAND WEAKEST LINK**

Identify where the weak links and biggest threats are within existing operations to proactively circumvent risks, closely monitor specific situations, or tightly-couple within business continuity or disaster recovery measures

- **PREDICTIVE MODELING**

Perform ongoing predictive modeling to evaluate the impact of potential global scenarios (even “the unlikely”) to act upon situations that present opportunity or that deviate from acceptable risk to the enterprise (i.e. total cost, market pricing, supplier viability, continuity of operations, etc.)