AlixPartners

JULY 2021

THE RESIN EFFECT

From heart valves to dish soap, impacts from shortages and what to do about them

Further price increases are now on the way for many consumer products because of unprecedented shortages and disruptions in the fossil-fuel-based resin market. Resins are used worldwide in everyday products such as plumbing pipes, medical devices, toys, household-product packaging, and water bottles. And although manufacturers usually manage fluctuating costs, few of them are prepared to deal with supply chain disruptions. Because many resin-based products have low profit margins, their manufacturers have no choice but to pass the higher costs on to consumers. AlixPartners believes that the price increases may cause up to 15% price inflation for many household products in the coming months.

GROWING SUPPLY ISSUES

Due to growing demand, inclement-weather events, transportation issues, and certain long-term trends, resin supplies started to contract in the past year. In collaboration with Gardner Business Media, *CompositesWorld* magazine recently surveyed 144 composite fabricators and found more than 66% had reported or heard of supply chain shortages in the previous few months.

Much of the recent disruption has been driven by the COVID-19 global pandemic because the decline in vehicle traffic caused by lockdowns reduced demand for fuel and crude oil production, of which petrochemical feedstocks are by-products. There is still ample oil supply, but reduced motor fuel demand has reduced the feedstock supply for resins. Longer-term impacts on supply may come from moratoriums on drilling on US federal lands, as well as from frackers' decision to limit production and development at the present time.

Even though regulation, tax policy, and customer preference for low-carbon energy will also affect fuel demand in Western economies and China, it may be offset by demand growth in emerging economies. Crude refining for that growth supports the availability of naphtha and resin—but at different locations—and clever companies are finding ways to deal with supply imbalances by means of more recycling.

Natural gas, too, will progressively replace coal and heavy fuel oil for power generation globally, creating the natural gas liquids that supply polyethylene (PE) and polypropylene (PP) and some butylene-based resin production. The US petrochemical buildout is predicated on that dynamic, and it will continue given that there is still much coal to retire and that renewables will take further development to replace it.

We believe resin supply is currently short because of pandemic-driven fuel demand declines and the uptick in demand on the medical side, which takes natural priority. In addition, even though capacity is slowly returning, the pandemic also affected manpower at production sites throughout the supply chain.

The current challenges in the resin market have also led to complications involving:

1 Product quality

2 Cost of goods

3 Timeliness of delivery

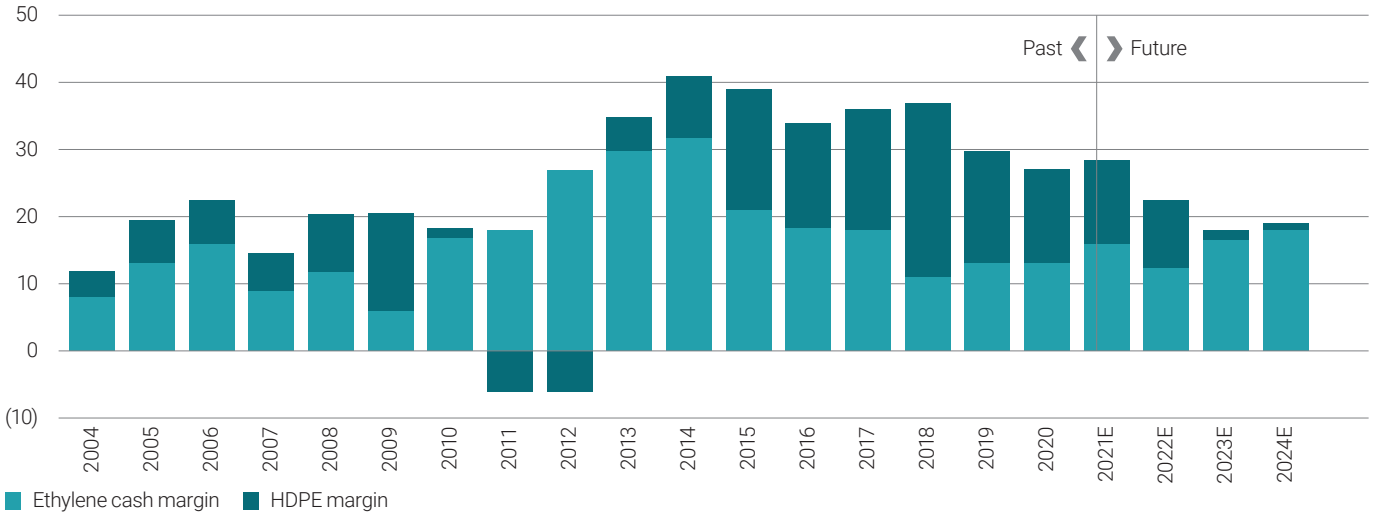
Depending on the grade, virgin resin prices are up 30% to 50% from a year ago—a significant problem because landed resin material constitutes more than 60% of manufacturers' total cost of goods sold. To make matters worse, railcar deliveries are becoming increasingly unreliable, aggravated by hoarding and the inability to use a resin that is already in inventory that doesn't meet technical specifications.

VIRGIN RESIN PRICES
are up 30-50% from a year ago

CHANGES ON THE HORIZON

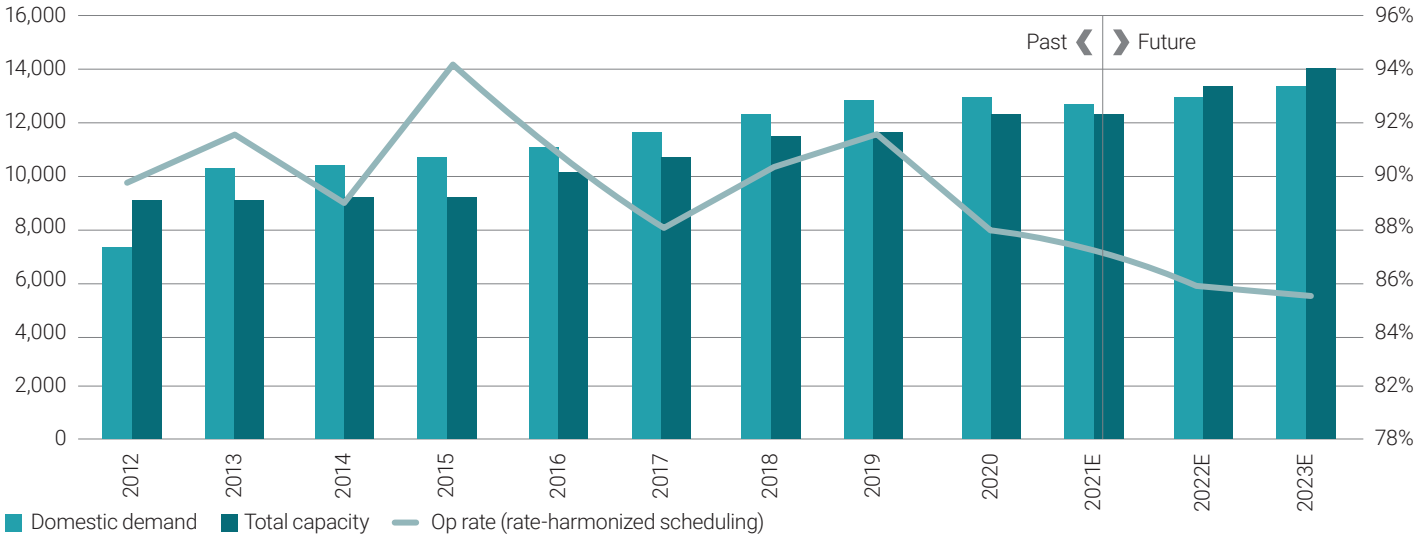
One bright spot is that global capacity expansion may close the demand gap. New global ethylene capacity, led by China, is expected to experience a 5.1% compound annual growth rate during the next three years, whereas demand is expected to grow by only 3.3%. In addition, ethylene operating rates are forecast to drop from 85% to 81%, and high-density polyethylene (HDPE) from 87% to 84% by 2024. North America (NA) will maintain its feedstock advantage versus Europe (EU), and at the same time, Middle Eastern (ME) producers will seek EU markets with their available low-cost capacity.

INTEGRATED NA ETHYLENE/POLYETHYLENE MARGINS (CENTS/LB)



Source: Deutsche Bank Research 'Trends for Chems' 15 February 2021

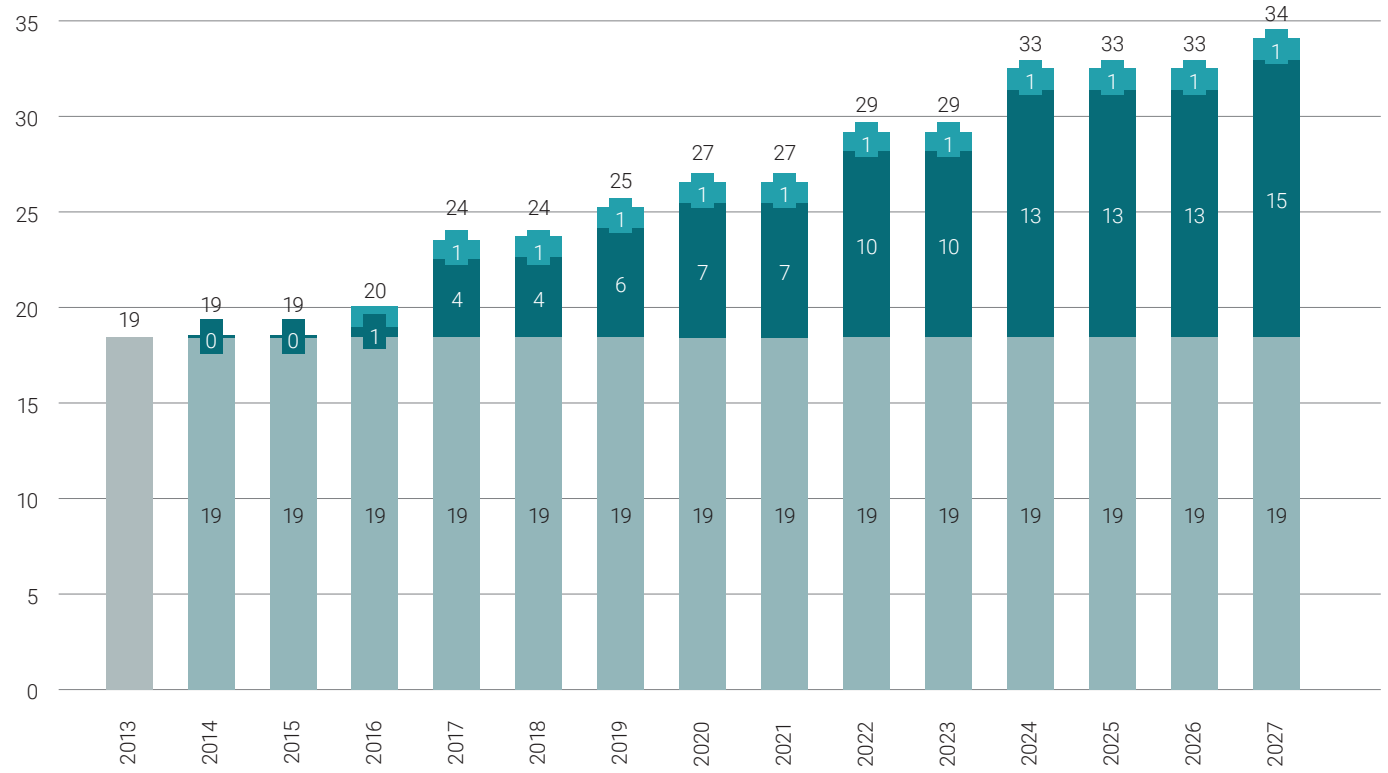
NA HDPE CAPACITY AND TOTAL DEMAND ('000 METRIC TONS)



Source: Deutsche Bank Research Trends for Chems 15 February 2021

Low-density polyethylene (LDPE) and HDPE prices are expected to drop in the next couple of years based on large capacity expansions around the world. In some cases, new capacity in China is pushing out ME product, forcing it to markets in EU, which will likely push out some (feedstock-advantaged) NA exports just when big new capacities from producers like Nova and Braskem Idesa are coming online.

NA PE CAPACITY 2014-27 (MILLION METRIC TONS)



Source: Deutsche Bank Research Trends for Chems 15 February 2021

By 2013, NA PE capacity was about 18.5 million metric tons, with a further, 14.6 million metric tons to be added from 2014 to 2027; but only 7% of the increase relates to Braskem Idesa.

Comparatively, projects by Formosa Plastics represent the largest proportion of the additional capacity—at 15%—followed by ExxonMobil at 12% and Chevron Phillips Chemical/Qatar Petroleum at 11%.

As the resin market deals with increasingly unpredictable demand, new technologies and government regulations are also in play. In the coming years, growth in the electric-vehicle sector will reduce demand for diesel and feedstock of resin. In addition, both the US and EU are introducing policies that will restrict the oil industry, which will increase supply uncertainties as manufacturers move away from petroleum-based products.

10-15%

INCREASE IN RECYCLED MATERIAL
because of increased demand

RETHINKING RESIN STRATEGIES

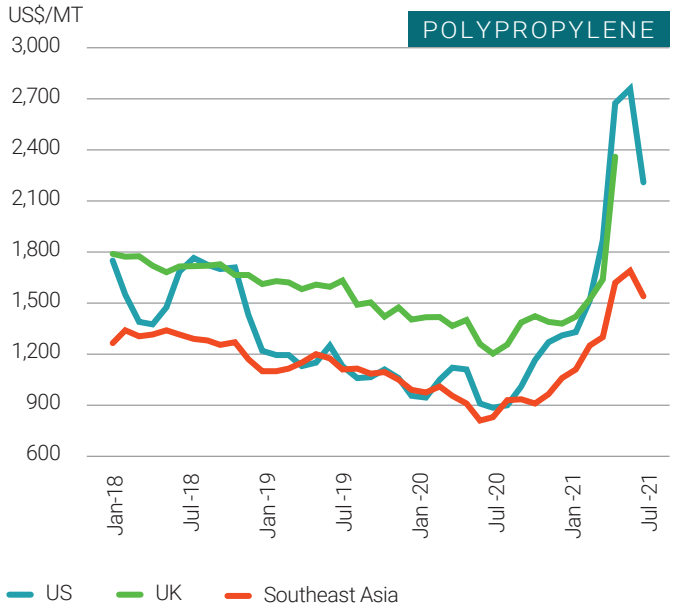
The growing disruptions have led many in the resin-based supply chain to rethink:

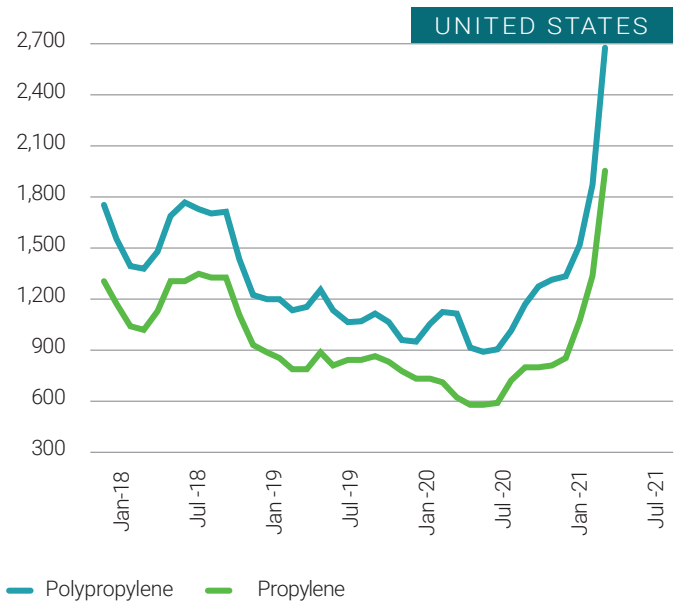
Companies respond to shortages and variances in their own ways, one of which is to substitute recycled materials for prime resin. And although tolerances are critical in highly engineered products like heart valves, they usually aren't in products like garbage cans, industrial pipes, and many kinds of injection-molded parts. As a result, more and more manufacturers are finding more and more applications for recycled resins than they've used in the past. One AlixPartners client found an opportunity to tweak formulations for geosynthetic materials by using both PE and PP to satisfy customer requirements and reduce cost of goods sold.

Recycling is a viable option for many applications, but it can introduce throughput and product performance risks. Also, because the availability of recycled material is regional, the cost of transportation can sometimes offset the value of the material if the manufacturer cannot procure it locally. Even the cost of recycled material that is correlated to base resins is up significantly because of increased demand, and manufacturers are being required to supplement virgin with more regrind than previously specified. Some companies have been forced to use materials that don't meet required specs or that don't work best with their manufacturing processes, thereby creating throughput issues and limiting the ability to meet customers' performance requirements.

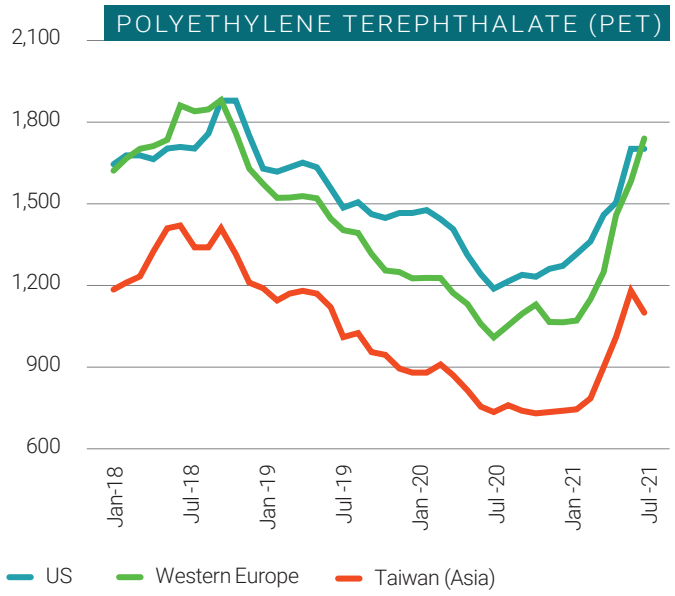
Another strategy in today's market is to break down products' components and then see whether suppliers can reformulate them with different materials. By breaking down polymers into monomers, a manufacturer can consider all of the underlying costs and then—potentially—reduce markups for adders and fillers. Although such a process can become complicated, for some manufacturers it can lead to cost reductions and prevent production disruptions.

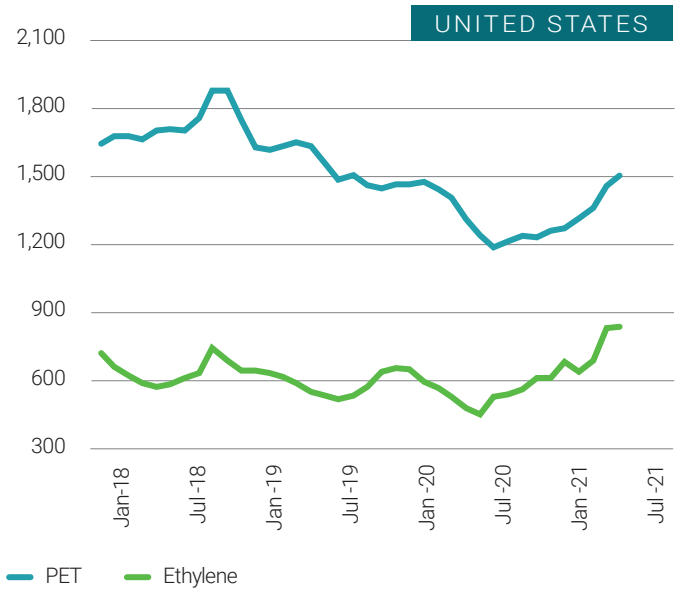
GLOBAL RESIN PRICE TRENDS: PROPYLENE FAMILY





GLOBAL RESIN PRICE TRENDS: ETHYLENE FAMILY





DISRUPTIONS ARE THE NEW STATUS QUO

In 2020, demand for PE and PP rose because of soaring demand for medical products and food packaging that got compounded by black swan outages. That became further aggravated by a downturn in drilling, and in some cases, suppliers declared forces majeures. As a result, today's situation is different from historical resin volatility. Businesses that depend on reliable supplies of resin, therefore, must embrace new strategies.

WHAT SHOULD YOU BE DOING?

Companies cannot control the market forces at play, but they can do several things to mitigate the risk and impact of supply chain disruption. We recommend taking the following four-step approach to better manage structural changes in the supply chain.

1

Beat the index/crack spreads

This will yield better results than trying to predict commodity prices. Ensure commodity price changes are identified and translated into product-pricing actions. The cadence of such pricing changes can be delicate when it comes to certain customers, so really think through the impact on all of your customers.

2

Break down the product formulation

Build more flexibility into production processes by either validating multiple material process formulations or harmonizing product specifications. Companies can help aggregate volume by harmonizing raw material at the monomer level in order to negotiate better pricing formulas. They can do that by reviewing the product breakdown of a base composition together with variable or fixed markup for fillers and adders.

3

Rebalance the supply chain

It's essential to implement risk management processes that deal with supply chain disruptions *before* the disruptions affect the manufacturer. That calls for finding the right balance between global sourcing, long-term contracts, and regional sourcing for certain commodities. More critical parts are to evaluate physical storage capacity and use trends and to analyze fill scenarios by using spot contracts versus futures contracts.

4

Rethink distribution and delivery methods

Finally, manufacturers should seek opportunities to improve their distribution modes and methods, such as bulk versus nonbulk orders, railcars, and silos versus gaylords. Manufacturers can also mitigate delivery problems by adopting a regional-procurement approach through distributors and can partner with suppliers that have the best distribution channels.

Even though organizations in the resin supply chain can't predict where the past year's disruption will lead in the coming months or years, the implementation of these new strategies can help them manage uncertainties and risks.

AlixPartners

CONTACT THE AUTHORS:

Marc Iampieri
Managing Director
miampieri@alixpartners.com

Bob Sullivan
Managing Director
bsullivan@alixpartners.com

Vance L. Scott
Managing Director
vlscott@alixpartners.com

Michael Held
Director
mheld@alixpartners.com

Sudeep Suman
Director
ssuman@alixpartners.com

ABOUT US

For more than 40 years, AlixPartners has helped businesses around the world respond quickly and decisively to their most critical challenges – circumstances as diverse as urgent performance improvement, accelerated transformation, complex restructuring and risk mitigation.

These are the moments when everything is on the line – a sudden shift in the market, an unexpected performance decline, a time-sensitive deal, a fork-in-the-road decision. But it's not what we do that makes a difference, it's how we do it.

Tackling situations when time is of the essence is part of our DNA – so we adopt an action-oriented approach at all times. We work in small, highly qualified teams with specific industry and functional expertise, and we operate at pace, moving quickly from analysis to implementation. We stand shoulder to shoulder with our clients until the job is done, and only measure our success in terms of the results we deliver.

Our approach enables us to help our clients confront and overcome truly future-defining challenges. We partner with you to make the right decisions and take the right actions. And we are right by your side. When it really matters.