STRONGER DEMAND ANTICIPATED IN 2021
Industry analysts believe that 2021 may mark a slow return to normalcy for the chemicals and plastics markets.

OIL PRICES REBOUND FROM LOWS
Following all-time lows in the spring of 2020, oil prices have slowly climbed back toward historical levels.

PLASTIC PRICES RISE DRAMATICALLY
Market prices of polyethylene and polypropylene resin have increased due to tight supplies and strong demand.

THE BEGINNING OF A RECOVERY?
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Deals are a moving target. A constantly shifting mix of people, numbers and timing. We’re here to simplify this process for you. Our experts are dedicated to tracking down and flushing out the values you need even on the most complex deals, so you can leverage our hard-won knowledge to close the deal.
NOLVs
• **Chemicals:** Recent NOLVs for chemical appraisals were mixed, increasing or decreasing up to seven percentage points, with fluctuations driven by gross margins and shifts in the inventory mix.

• **Plastics:** For plastics appraisals, NOLVs increased up to three percentage points due to strong recent demand and improvements in gross margin.

SALES TRENDS
• **Chemicals:** Sales volumes increased due to strong demand for certain categories, particularly household cleaning and disinfecting chemicals. Agricultural chemicals also performed well.

• **Plastics:** Sales were relatively consistent with pre-pandemic levels. Sales declined significantly at the start of the pandemic, followed by increases in recent months.

GROSS MARGINS
• **Chemicals:** Gross margins increased up to two percentage points. Margins improved due to increases in selling prices and lower input costs for certain products.

• **Plastics:** Gross margins for plastics increased one to four percentage points due to favorable resin prices in early 2020 and strong demand as the economy recovered in recent months, allowing for higher selling prices. Gross margins were also impacted by company-specific factors such as a focus on plant efficiency and higher-margin business.

INVENTORY
• **Chemicals:** Inventory levels ranged from flat to an increase of 5% as industry participants aligned their inventory levels with demand.

• **Plastics:** Inventory levels varied by appraisal, increasing or decreasing up to 10%. Some companies lowered inventory levels due to market uncertainty, while others had inventory levels depleted due to strong demand. Conversely, inventory levels on a dollar basis were driven upward by higher market prices.

SELLING AND MARKET PRICES
• **Chemicals and plastics:** Selling and market prices increased in recent appraisals. Oil prices, in particular, have rebounded from the lows seen in the spring and early summer of 2020. Selling prices increased due to the higher input costs, as well as strong demand from customers. Prices for plastics were also driven upward by some supply outages caused by winter storms, which resulted in tight supplies for certain products.
Trend Tracker - Machinery and Equipment

| Used Pricing | Consistent / Increasing ▲ |
| Used Trade Movement | Increasing ▲ |
| OEM Pricing | Increasing ▲ |
| Technology Advancement | Increasing ▲ |
| Auction Activity | Decreasing ▼ |

**USED PRICING**

While pricing for most used equipment has remained consistent, pricing for certain categories has increased due to the pandemic, particularly equipment used for medical products, housewares, recycling, and pipe profiles, all of which have been in demand during the pandemic.

**USED TRADE MOVEMENT**

Due to long lead times from OEMs, used equipment is trading well, particularly equipment that is in demand due to the pandemic. Demand has not been as strong for the automotive and sheet production markets.

**OEM PRICING**

As the economy recovers, OEMs are seeing increased lead times and backlogs. This has led to lower discounts as the OEMs attempt to recover from production lost in the early stages of the pandemic. Tariffs imposed on goods sourced from China also increased pricing for some equipment.

**TECHNOLOGY ADVANCEMENT**

Automation remains a key focus as processors seek ways to insulate themselves from workforce issues, such as those seen during the pandemic. Electric drive injection molding machines continue to make headway in the marketplace due to their efficiency and relatively low maintenance.

**AUCTION ACTIVITY**

As business activity slowed during the pandemic, B. Riley Advisory Services observed a reduction in auction activity. Auction activity may remain subdued if the economy recovers or may increase should another wave of COVID-19 cause businesses to close permanently.
Overview

Following a challenging 2020 - a year in which manufacturers and distributors contended with a global pandemic, dramatic fluctuations in input costs, and weak demand from a number of key downstream industries - the chemicals and plastics sectors are poised for a rebound in 2021.

The COVID-19 pandemic had a complex and multifaceted impact on the chemicals and plastics sectors. It caused falling demand from a number of key sectors, particularly automotive production; supply disruptions; and a sharp decline in market pricing for crude oil, a key input for many chemical and plastics products. On top of these issues, 2020 was a year characterized by political uncertainty in the U.S. due to the presidential elections. While the cumulative impact of the downturn is difficult to quantify, industry experts generally agree that sales and trade declined significantly last year.

Despite the challenges, a number of silver linings appeared as the year progressed. Many industry participants were able to adapt their operations to the unique needs of the pandemic, such as heightened demand for personal protective equipment and chemicals for household cleaning and disinfecting. This helped to offset losses from traditional business.

The housing sector, a major consumer of chemical and plastic products, saw growth as many Americans chose to leave cities for suburbs and rural regions. According to the U.S. Census Bureau and the Department of Housing and Urban Development, privately-owned housing starts in December 2020 increased 5.2% from December 2019 to a seasonally adjusted annual rate of 1.7 million units.

Lastly, the plastics industry actually saw demand grow last year due to the key role that a variety of plastic products played in the pandemic, such as single-use food and medical packaging, personal protective equipment (face masks, gloves, gowns, face shields), and plastic components for medical equipment.

Looking forward, many signs point toward a recovery in 2021. Perhaps most importantly, downstream demand appears to be recovering in some sectors. For instance, in the first quarter of the year, new car sales increased due to pent-up demand and normalization of the supply chain, with many auto manufacturers reporting double-digit year-over-year growth, though admittedly from pandemic lows. Industry analysts also remain optimistic about the housing market, projecting further growth in 2021. In addition, the new U.S. presidential administration recently announced a renewed commitment to infrastructure development, which could boost demand for industry products. Consumer spending is also expected to rebound as the economy improves.

Despite these positive signs, it may take some time for demand levels to reach pre-pandemic highs. Furthermore, the final and cumulative effect of COVID-19 on the global economy remains uncertain. An ongoing pandemic could significantly impact the chemicals and plastics markets going forward.
Feedstocks

FEEDSTOCKS OVERVIEW
A majority of chemicals and plastics are derived from petroleum or natural gas. Any fluctuations in the prices of these commodities impact the downstream chemicals and plastics sectors.

PETROLEUM
In April 2020, during the early stages of the COVID-19 pandemic, spot prices for West Texas Intermediate ("WTI") crude oil fell to $16.55 per barrel, the lowest monthly average in more than two decades and a decrease of over 70% from the start of the year.

Since that point, oil prices have gradually climbed back toward historical levels. According to the Energy Information Administration (EIA), WTI crude oil prices averaged $62.33 per barrel in March 2021, which is the highest monthly average since April 2019.

According to estimates from the EIA, working gas in underground storage totaled 1,784 billion cubic feet ("Bcf") for the week ended April 2, 2021, which represents an 11.6% decrease from the previous year. The following table illustrates working gas in underground storage in the lower 48 states (units in Bcf):

<table>
<thead>
<tr>
<th>Region</th>
<th>4/2/21</th>
<th>4/2/20</th>
<th>% Change</th>
</tr>
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<tbody>
<tr>
<td>East</td>
<td>305</td>
<td>382</td>
<td>(20.2%)</td>
</tr>
<tr>
<td>Midwest</td>
<td>398</td>
<td>475</td>
<td>(16.2%)</td>
</tr>
<tr>
<td>Mountain</td>
<td>115</td>
<td>92</td>
<td>25.0%</td>
</tr>
<tr>
<td>Pacific</td>
<td>198</td>
<td>202</td>
<td>(2.0%)</td>
</tr>
<tr>
<td>South Central</td>
<td>768</td>
<td>867</td>
<td>(11.4%)</td>
</tr>
<tr>
<td>Total</td>
<td>1,784</td>
<td>2,019</td>
<td>(11.6%)</td>
</tr>
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Henry Hub natural gas prices stood at $1.79 per million BTUs ("MBTU") in March 2020. Prices remained relatively stable through the summer and began to gradually increase in the fall and winter. Market prices spiked to $5.35 per MBTU in February 2021 due to cold temperatures across the U.S., coupled with supply issues caused by production interruptions, but fell back to $2.62 per MBTU in March 2021.

NATURAL GAS
According to the EIA, U.S. commercial crude oil inventory for the week ended April 2, 2021 totaled 498.3 million barrels, a decrease of 3.5 million barrels from the previous week. The EIA notes that inventory levels are slightly above average for this time of year.
Chemicals

**PROPYLENE**
Propylene in the U.S. is derived from the processing of naphtha in ethylene steam crackers, as well as the refinement of petroleum into gasoline. Growth in demand for propylene has also resulted in some purposeful propylene manufacturing operations, as opposed to sourcing the material as a byproduct.

Propylene supplies decreased in the early months of the pandemic due to reduced refinery activity caused by weak demand for gasoline. Propylene production increased as 2020 progressed and crackers restarted, but supplies remained tight through year-end and into 2021. The supply shortage was exacerbated by strong demand for downstream polypropylene. Recently, however, many domestic polypropylene manufacturers were knocked offline by winter storms, which resulted in a sharp decline in demand for propylene and a corresponding dip in market prices.

**ETHYLENE**
Ethylene is produced in the steam cracking of ethane, as well as the cracking of naphtha. One of the largest downstream uses is the production of polyethylene resin, which is one of the most commonly used plastics across the globe.

Ethylene supplies did not drop as significantly as propylene supplies in the early months of the pandemic. However, an active hurricane season in 2020 caused some outages, reducing inventory levels, and this was exacerbated by strong winter storm activity in Texas early in 2021, which caused further outages. The decreased production, coupled with COVID-related supply chain issues and strong plastics demand from Asia and the U.S., resulted in tight supplies and escalating market prices in the first quarter of 2021. Industry experts anticipate that market prices will soften in the coming months as market conditions begin to normalize.
Polypropylene, a polymer which is derived from propylene, is one of the world’s most commonly-used plastics.

Polypropylene prices bottomed out in the spring and early summer of 2020. The low prices were caused by demand erosion resulting from the COVID-19 pandemic, as well as ample supplies and low feedstock pricing. Prices began to gradually increase through the summer and into the fall, a trend that gained steam as a number of hurricanes caused production outages, tightening supplies of both feedstock propylene and polypropylene.

In early 2021, the price escalation intensified. Despite the ongoing global pandemic, demand proved to be more robust than many had anticipated. Winter Storm Uri then hit the Gulf Coast in February, causing many producers of both propylene and polypropylene to temporarily shut down. The tight supply and strong demand caused prices to jump dramatically in February and early March. Since that point, many producers have come back online. While supply and demand remain imbalanced, prices have eased from recent highs.

Polyethylene, a plastic derived from ethylene feedstock, is another of the world’s most widely used plastic materials.

As is often the case, the trajectory of polyethylene pricing mirrored polypropylene pricing over much of the past year. Polyethylene market prices hit their recent low in the spring and early summer of 2020, which was caused largely by weak demand in the early months of the COVID-19 pandemic.

In subsequent months, market prices began to recover, with the gains caused largely by stronger-than-anticipated demand as the U.S. and global economies began to reopen. Production levels had been low, leading to constricted supplies, which encouraged the price hikes. The polypropylene markets then contended with the same hurricanes that impacted the polypropylene market in the fall, followed by Winter Storm Uri in February 2021. These factors served to significantly tighten the supply of feedstock ethylene, while demand for polyethylene remained very strong. Prices continued to climb through April 2021, with experts anticipating that prices may soften in the coming months.
The plastics processing industry relies heavily on downstream demand, ranging from food packaging to automotive equipment, for plastic products. The mix of consumer products demanded in the last year shifted, and the companies that pivoted into the in-demand areas have done well.

The production of medical devices, home goods, appliances, and construction equipment has helped stabilize injection molding machine values. However, resin shortages and price increases are affecting all types of plastic processors. February’s Winter Storm Uri along the Gulf Coast caused a large disruption in North American resin production. This, coupled with the increase in oil and gas prices, caused significant increases in the price of most resins. As the primary input in plastics operations, resin prices have a significant effect on plastics processors’ profitability and capital expenditures. The increase in prices is expected to bolster the recycling market.

The secondary market for plastics equipment has tightened. OEMs are recovering from shutdowns and have seen increases in orders and longer lead times. Equipment vintages of five years or less are the most desirable and trading well for injection molding equipment (10 years or less for extrusion equipment). Demand for plastics equipment from the late 1990s to mid-2000s previously had fallen sharply, due both to its age and the surplus of older equipment in the secondary marketplace. Long OEM lead times and a need for equipment has shown equipment in the mid-2000s to be temporarily in demand.

The auto market has recovered far better than originally predicted but is still not expected to recover fully until 2022, which will affect the large tonnage injection market. The housing, remodeling, and construction markets continue upward. The production of PVC trim, pipe, conduit, composite decking, roof tiles, and appliance components will cause the demand for mid-range injection molding machines and extrusion machines to remain stable.

Injection molding machines manufactured in China continue to have an impact on the plastics machinery resale market. The lower cost of this machinery as compared to counterparts built in the U.S., Europe, or Japan had some manufacturers reconsidering their equipment supply chain, especially prior to the COVID-19 pandemic. However, accessing machinery and parts from China in the age of COVID-19, as well as the volatility of trade relations with China, are concerns at the forefront of plastics processors’ minds. New machines produced in China are still available at a price point of a five- to seven-year-old tier one brand (i.e. Milacron (US), Krauss Maffei (Germany), Engel (Austria), or Nissei (Japan)). The machines produced in China also come equipped with energy saving servo pump technology, name brand controls, and better warranties. However, manufacturers in China are currently battling steel tariffs and may have to start raising prices closer to those seen in the U.S.

In order to remain competitive, U.S. manufacturers need to monitor interest rates and their effect on the housing and construction industries. Additional areas to watch will be the passage of an infrastructure bill, repatriation of critical supply chain elements, plastic and chemical legislation, bans on specific plastics products, chemical recycling, inflation, and bio-resins.
Monitor Information

The *Chemicals and Plastics Monitor* relates information covering many chemicals and plastics, including industry trends, market pricing, and their relation to our valuation process. Due to the commodity nature of certain chemicals and plastic resins, timely reporting is necessary to understand an ever-changing marketplace. In addition, pricing trends are impacted by a number of macroeconomic indicators that should be monitored, and B. Riley Advisory Services strives to contextualize these indicators in order to provide a more in-depth perspective of the market as a whole. Please feel free to utilize our contact information shown in this and all *Chemicals & Plastics Monitor* issues.

The information contained herein is based on a composite of B. Riley Advisory Services’ industry expertise, contact with industry personnel, liquidation and appraisal experience, and data compiled from a variety of well-respected sources believed to be reliable. We do not guarantee the completeness of such information or make any representation as to its accuracy. B. Riley Advisory Services does not make any representation or warranty, expressed or implied, as to the accuracy or completeness of the information contained in this issue. Neither B. Riley Advisory Services nor any of its representatives shall be liable for use of any of the information in this issue or any errors therein or omissions therefrom.
B. Riley Advisory Services has worked with and appraised numerous companies within the chemicals and plastics industries. While our clients remain confidential, they include well-known and significant global, national, and regional producers and distributors of commodity and specialty chemicals, chemical intermediates, plastics, and resins for uses throughout the construction, automotive, oil and gas, food and beverage, manufacturing, and agricultural industries.

B. Riley Advisory Services has appraised companies such as the following:

- A global manufacturer of chemicals and plastics, a refiner of crude oil, and a significant manufacturer of fuel products, with annual sales of nearly $20 billion;
- One of the largest global manufacturers and distributors of high-performance polymer resins and resin-based products, with locations throughout the world and sales exceeding $3.5 billion annually;
- A manufacturer and distributor of plastic packaging such as containers, closures, tubes, and bottles, with revenue of $3.5 billion annually;
- Two of the world’s largest producers of integrated fibers and polymers, with annual sales of $1.4 billion and $3 billion, respectively;
- One of the nation’s leading specialty chemical producers, with annual revenue of over $1.5 billion;
- A distributor of crop input products to customers in the mid-southern regions of the U.S., including herbicides, various agricultural chemicals, insecticides, defoliant, surfactant, fertilizer, seed, and similar goods;
- One of Europe’s leading specialty chemical producers; and
- A producer of specialty chemicals derived from renewable resources serving the pharmaceutical, rubber production, and agricultural markets, among other industries.

B. Riley Advisory Services also maintains extensive appraisal experience with a variety of plastic bottle and plastic container manufacturers, as well as foam and foam product manufacturers. B. Riley Advisory Services has also appraised a variety of small and middle market commodity and specialty chemical manufacturers and distributors. B. Riley Advisory Services has been involved in the asset disposition and valuation of many plastics processing facilities involving injection molding, blow molding, extrusion, thermoforming, and more. Recent transactions include: Cincinnati Milacron, Collins & Aikman, Essel Propack America, Fortis Plastics, Home Products International, Hunjan Group, ILPEA Industries, Interbath, Jodee Plastics, Kamco Plastics, MedPlast, Mullenix Packages, Packaging Plus, Rantoul Products, Royal Dynamics, Thomas Plastics, and United Plastics Group.

Given our experience in both the valuation and disposition of chemicals and plastics processing equipment, B. Riley Advisory Services is uniquely qualified to not only render value opinions, but to also serve your liquidity needs through the sales of surplus and/or idle chemicals and plastics processing assets. In addition to our vast liquidation and appraisal experience, B. Riley Advisory Services maintains contacts within the chemicals/plastics industry that we utilize for insight and perspective on recovery values.
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- Restructuring & Recapitalization
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- Sales & Trading
- Equity Research

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- Inventory Clearance
- Appraisal & Valuation Services
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Provides dedicated resources that drive value with the firm’s alternative asset manager clients by developing and maintaining relationships with middle market financial sponsors.

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Invests in late-stage private growth companies with a path towards public markets.

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- Valuations
- Asset Planning & Recovery Strategies
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