

May, 2020

The Chemical Reaction



Introduction

Welcome to The Chemical Reaction, where our team of experts keeps you up to date with all things Chemicals. Find highlights on current events, key trends and much more in the content below. Interested in learning more on a certain subject? Navigate to a report through the links included or reach out to one of our qualified analysts for more information.

Our recent Insights and Informs:

- [Coronavirus and polymers - sustainability through the pandemic](#)
- [Coronavirus and collapse in polyester - will PX and PTA markets recover?](#)
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Q2 2020



Coronavirus and polymers - sustainability through the pandemic

Andrew Brown, Guy Bailey 29 May 2020

In our most recent [Coronavirus and Polymers update](#), we take a deep dive into the impacts of the virus on sustainability. It's been clear that this has been a theme at the front of our clients' minds, with questions around the degree to which brands are maintaining their commitments and how regulatory frameworks are being adjusted in response to the virus.

Key points from this week's update include:

- how recycled polymer prices are reacting to the demand shock and value chain disruption
- our view on brands aligning with sustainability targets through the epidemic
- what unwinding economies will mean for polymer demand



RPET market disrupted by oil price crash and coronavirus

Chloe Kinner, 28 May 2020

Issue

- The pandemic is causing significant disruption to the collection and sorting of recycled polyethylene terephthalate (RPET) material globally.
- Virgin PET (VPET) prices decreased sharply following the oil price crash putting downward pressure on the RPET prices this month following two months of relative strength. The premium for RPET material over VPET is unprecedented, with the Europe's RPET price now nearly double VPET.

Europe and US food grade RPET/VPET price ratio



Implications

Despite declining VPET prices, RPET prices have held relatively firm buoyed up by strong bottle recycled content demand, particularly in the US and Europe, and lower availability due to collection disruptions.

- **Collection disruption:**

In Europe, some sorting and collection facilities temporarily closed due to lack of availability of material and manpower. In the US, many collection systems have temporarily relaxed deposit return measures and as many as 80 municipal kerbside collection programs have been suspended. In China, collection and processing of RPET in early 2020 almost ground to a halt due to lockdown measures and concerns around the health and safety of informal collection.

- **Low VPET prices:**

Low-level VPET prices are encouraging the substitution of VPET for RPET, particularly in sheet applications. The tight availability of RPET flake, (material from shredding bottles) because of reduced collection is further compounding the situation. In Europe and the US, RPET food grade is in peak demand, driven by brand owner targets and regulation in Europe. In China RPET food grade capacity and demand is more limited; many producers are switching to producing virgin fibre or other more profitable grades. Some RPET staple fibre producers have been forced to reduce operating rates or even shut down to avoid stockpiling.



- **Recycled content targets and regulation:**

The plastic tax in Italy and consultation of packaging tax in the UK has been delayed. EuPC wrote to the EU commission to delay the implementation of the single-use plastics directive. Plastics Recyclers Europe released a statement that the recycling industry is closing production due to the pandemic, lack of demand, low VPET prices, decreased global activity and the closure of converting plants.

Outlook

- It remains to be seen how long RPET prices will hold up at these levels. Ultimately current RPET food grade premiums in Europe are not sustainable. In China, fibre demand is anticipated to be pessimistic in the long term, and more flake producers are expected move to producing high-quality certificated flake.
- Despite food grade margins being strong, the current climate isn't conducive to investment levels needed in collection and reclamation infrastructure to reach regulatory and brand targets. It is likely that further regulations in Europe will be delayed, and that brands will follow suit even if they continue to strive for targets but fall short with the caveat of the pandemic causing significant disruption.
- RPET availability is expected to continue to be relatively tight and competition for material will continue to be high, adding strength to the RPET market once VPET prices recover. Additional mergers and acquisitions are anticipated as brands move further back into the recycling chain and recycling companies consolidate their offerings from collection through to pelletisation.
- Ultimately significant growth in the RPET market is still anticipated.

More information can be found in our [RPET Long-Term service](#)

AGIC of Saudi Arabia progresses investment of one of the world's largest PDH facilities

Patrick Kirby, 22 May 2020

Issue

- Recent announcements confirm continued development of the project which centres around an 843 ktpa propane dehydrogenation (PDH) unit and 800 ktpa of polypropylene to be located in Al Jubail, Saudi Arabia
- Technologies utilised in the investment will be Lummus CATOFIN process for PDH and Spheripol/Spherizone technology from LyondellBasell for two trains of polypropylene at 400 ktpa each
- Fluor has been selected to provide project management and consultancy services for FEED, detailed engineering, procurement and construction phases
- Wood Mackenzie assesses the project with a feasibility as engineering-likely with expected onstream date around the middle of the decade

Implications

- The scale of the PDH unit would make it one of the largest facilities under consideration globally and larger than any operational asset today. The largest PDH unit scale today is 750 ktpa
- This investment would mark the first PDH plant to be brought online in Saudi Arabia since 2010. The average scale being almost double that of historical investments



- AGIC (Advanced Global Investment Company) is a subsidiary of Advanced Petrochemical, which currently operates an existing PDH plant in Al Jubail, Saudi Arabia
- The capital cost estimate for the project is in the range of \$1.8 billion

Outlook

- Saudi Arabian propane pricing is structured at a discounted level relative to export pricing benchmarks. This and the large scale of the asset will improve overall project economics
- The PDH technology has been employed as the preferred on-purpose route to produce propylene in most markets around the world. Further capacity is planned or under construction in North America, Greater Europe and Asia Pacific alongside this investment in the Middle East

Further market insights are available in our [propylene global supply demand analytics service](#) and [polypropylene global supply demand analytics service](#)

Coronavirus and collapse in polyester - will PX and PTA markets recover?

Joyce Grigorey, 21 May 2020

The fibre and textile industries - by far the largest consuming segments for polyester - have continued to be battered by the impact of the coronavirus. The recovery is likely to be protracted with the pandemic continuing into the summer months and beyond. The production lost in 2020 could take at least two years to be restored.

The PX and PTA markets were already grappling with reduced operations and margin compression due to global over-capacity and this corona-driven collapse in demand casts further gloom on these markets. With large capacity additions still to come, operating rates for both commodities will be forced down to historic lows.

[This insight](#) highlights some of the key takeaways from our recent quarterly supply-demand update, as well as explores some of the implications that the collapse of polyester demand is having on the paraxylene and PTA markets.

Borealis pulls the plug on ethane cracker project in Kazakhstan

Patrick Kirby, 19 May 2020

Issue

- Borealis today announced its decision to not pursue the development of a 1,250ktpa integrated ethane cracker and polyethylene project in the Republic of Kazakhstan.
- Wood Mackenzie had categorised this investment in the “unlikely/unknown” category of ethylene-polyethylene projects, the announcement provides confirmation of this assessment.
- A propane dehydrogenation (PDH) project, not involving Borealis, is currently under construction at the same cluster that the steam cracker complex was planned for. LG Chemical had been associated with the ethane cracker project in prior years, but also decided not to progress further.

Implications

- It is expected that further adjustments to ethylene capacity development are to be expected in the near-medium term, either through project delays or complete cancellations. Projects that are at earlier stages of development, particularly in planning stages from Wood Mackenzie classifications could be most at risk.



- The uncertain outlook for oil pricing and ethylene consumption currently, will undoubtedly shape capital investments in the next 1-2 years. This will play into global ethylene supply build and global operating rates and profitability.
- We had previously assessed approximately 50 million tons of firm/likely ethylene projects globally, with around 30 million tons in construction. Plants that are under construction we expect to be completed, but projects in planning or engineering have a real potential of being scaled back due to the coronavirus effect.

Outlook

- This announcement from Borealis follows several other announcements recently surrounding the company, including the [Novealis JV](#) in the United States and recent ownership structure changes with Mubadala Investment Company and OMV. Borealis has begun construction on a large investment in Antwerp, Belgium for a worldscale PDH plant. However, it is currently assessing earlier plans to expand its existing polypropylene plants in the European region.
- Wood Mackenzie is constantly monitoring and classifying these projects in detail and clients can gain further insight via our supply/demand analytics services and ethylene asset cost tool services.

Coronavirus: Effects on chemical business economics and projects

Enrique Galindo, 21 May 2020

The coronavirus has profoundly impacted economies and industries around the world, and the chemical industry is no exception. Important economic indicators such as GDP, inflation/deflation and unemployment rates have shown the massive harmful economic impact of the coronavirus across the globe.

Companies have responded by incurring capital expenditure reductions, shrinking operating expenses, deferring projects, or exploring partnerships and joint ventures in order to adhere to a more risk-averse strategy as the world continues to adapt to the long lasting effects of the virus.

For a thorough review the effects of the coronavirus on chemical business economics and projects, navigate to our insight [here](#).

Plastic products export reshape China's polyolefins demand growth in 2020

William Liu, Ashish Chitalia, 15 May 2020

In 2019, China represented 33% of polyethylene and 39% of polypropylene global demand. The country has traditionally been the primary demand center for polyolefins, not only as a direct consumer of finished goods but also as a prominent exporter of finished products. In our [polyethylene supply demand analytics service](#), we assessed China's demand growth for polyethylene at 4.9% and polypropylene at 3.7%. These numbers reflected our view at the beginning of April, which is being evaluated weekly via our [Coronavirus and Polymers](#) insight series.

In this [insight](#), we are examining China's total resin demand. Specifically, the drop in the finished goods exports, which are impacting polyolefins demand.

Will China's escalating ban on imports of waste paper lend a hand to the embattled dissolving wood pulp (DWP) sector?

Bruna Angel, 19 May 2020

Issue

- On 29 April, China's National People's Congress Standing Committee approved a revision to the country's solid waste management policies, which included the goal of achieving zero imports of solid waste. China eliminated imports of mixed,



unsorted waste and scrap paper and paperboard in 2019. The current revision would eliminate all imports of waste and scrap paper and paperboard.

- These imports, included under HS code 4707, fell by 64% from the recent peak of 29 million tonnes in 2015 to 10 million tonnes in 2019. In Q1 2020 they are down a further 50% year-on-year.
- The US has been the major supplier of this product to China, with a 44% share of the import market in 2016, rising to 57% in Q1 2020.

Chinese imports of waste and scrap paper and paperboard



Source: Global Trade Tracker, Wood Mackenzie Chemicals

Implications

- The paper and paperboard produced in China to meet the country’s manufacturing and logistics industries’ packaging requirements, incorporates a high proportion of low cost recovered fibre from waste and scrap paper and paperboard. A replacement for these imports is required as domestic recovered fibre is already fully utilised. Consequently, these paper and paperboard mills need to source virgin pulp.
- Growing domestic demand for chemical paper grade pulp for paper and paperboard production over the past two years encouraged Chinese DWP mills to steadily switch production to kraft paper grade pulp. This has cut global capacity available for viscose staple grade DWP production by some 1.66 million tonnes, helping to shrink excess DWP capacity.
- This reduction in excess capacity has helped to stabilise viscose staple fibre (VSF) grade DWP prices over the past couple of months after weakening downstream demand led to prices falling by a third since mid-2018. But this has not prevented DWP mill closures and shutdowns, including the closure of the Sniace (Spain) mill and temporary shutdowns at the Jari Celulose (Brazil) and Cosmo Specialty Fibers (USA) mills.



Outlook

- The current elimination of the Chinese DWP capacity has temporarily alleviated the position of other DWP producers.
- But these DWP producers are now faced with the threat of substantial new capacity coming onstream in Brazil, contributing to excess supply.
- These developments are threatening the future of high cost DWP producers serving the man-made cellulose fibres industry.
- This situation could be reversed if Chinese viscose and lyocell staple fibre demand and production takes off as the domestic and global markets emerge from the Coronavirus pandemic.

Coronavirus and polymers - how polyolefin markets have reacted to the outbreak

Andrew Brown, Michael McDermott, 15 May 2020

This week's edition of coronavirus and polymers highlights the dynamic forces affecting polyolefin value chains. While the slowdown in many sectors has affected demand to varying degrees, how do diversified polyolefin markets hold up against the outbreak? What is the impact of low oil prices on producer margins?

While we anticipate recovery, the post-virus landscape is likely to be very different and we discuss the structural changes we expect within polyolefin markets, specifically. Navigate to our most recent update [here](#) to find out more.

Ethylene Oxide: A coronavirus review

Andrew Day, 15 May 2020

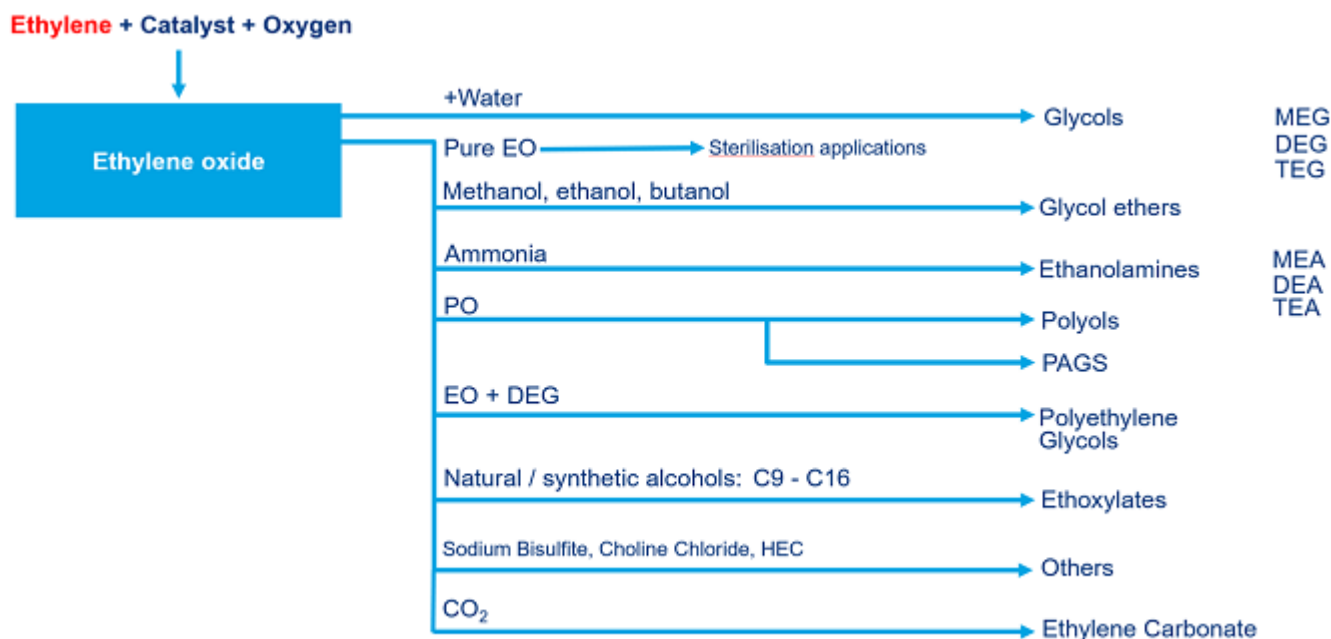
As the global pandemic continues to wreak havoc across the world's economies, touching and affecting almost every aspect of daily life, we hear much about the key aspects of working life. Those in the medical profession, keeping the lights on at the energy and power works and keeping the water systems flowing and purified. The chemical industry is also a critical component in helping to keep the wheels of life and industry turning. We reflect here on the essential role that Ethylene Oxide (EO) and derivatives are playing in helping combat the spread of the virus.

EO is used predominantly to produce monoethylene glycol (MEG), which along with purified terephthalic acid (PTA) via paraxylene (PX), is a key feedstock for polyethylene terephthalate (PET) polymer manufacture (fibre and resin) and antifreeze formulations. Without EO, PET would be impossible.

In addition to EO for the manufacture of MEG there is also a wide array of derivative products produced thanks to its versatility and reactivity with several other chemicals. Our infographic below illustrates.



EO derivative flow diagram



Source: Wood Mackenzie

EO derivatives in turn have wide ranging applications, some of which are right at the front line of the fight against the coronavirus outbreak:

- **Ethanolamines** – Monoethanolamines and triethanolamines (MEA/TEA) used in laundry liquid and personal care products (soaps, shower gels). TEA is also used in some hand sanitiser formulations. Both MEA and diethanolamines (DEA) are also used in combination with coconut oil to produce a distinct set of cocamide surfactants
- **Polyethylene Glycols (PEGs)** - a wide range of products with several high purity grades used across the pharmaceutical and personal care industries.
- **Butyl Glycol Ethers** – used in household and industrial cleaning and disinfectant formulations
- **Ethoxylates** – also known as surfactants, this is an almost ever-expanding set of products used in handwash, personal care and other cleaning applications.

All of which makes EO production essential. For further information on our products EO/MEG/Derivatives, PTA (PX) and PET see the following reports:

- Olefins - Ethylene Oxide & Glycol Global Monthly Market Overview
- Aromatics - Paraxylene & Derivatives Global Monthly Market Overview
- PET - PET Global Monthly Market Overview

Coronavirus and polymers - are fibre markets spinning out?

Andrew Brown, Bruna Angel, Laura Murphy, Robert Gilfillan, 08 May 2020

In our [updated edition](#) of coronavirus and polymers we take a deep-dive into the impacts of the virus on fibre markets. Many fibre end-uses have been battered by slow demand and globally retail sales are weak. Well-known brands are filing for



bankruptcy pointing to the major issues facing the apparel industry. A small amount of this is offset by surging demand for medical PPE, however, and we review how fibre demand into this segment has reacted to the outbreak.

Our modelling work has been little changed, though we revisit the 'second wave setback' scenario developed in the second week of our series. We use this scenario to determine how polymer markets would respond to an H2 outbreak where countries again lockdown much like in H1.

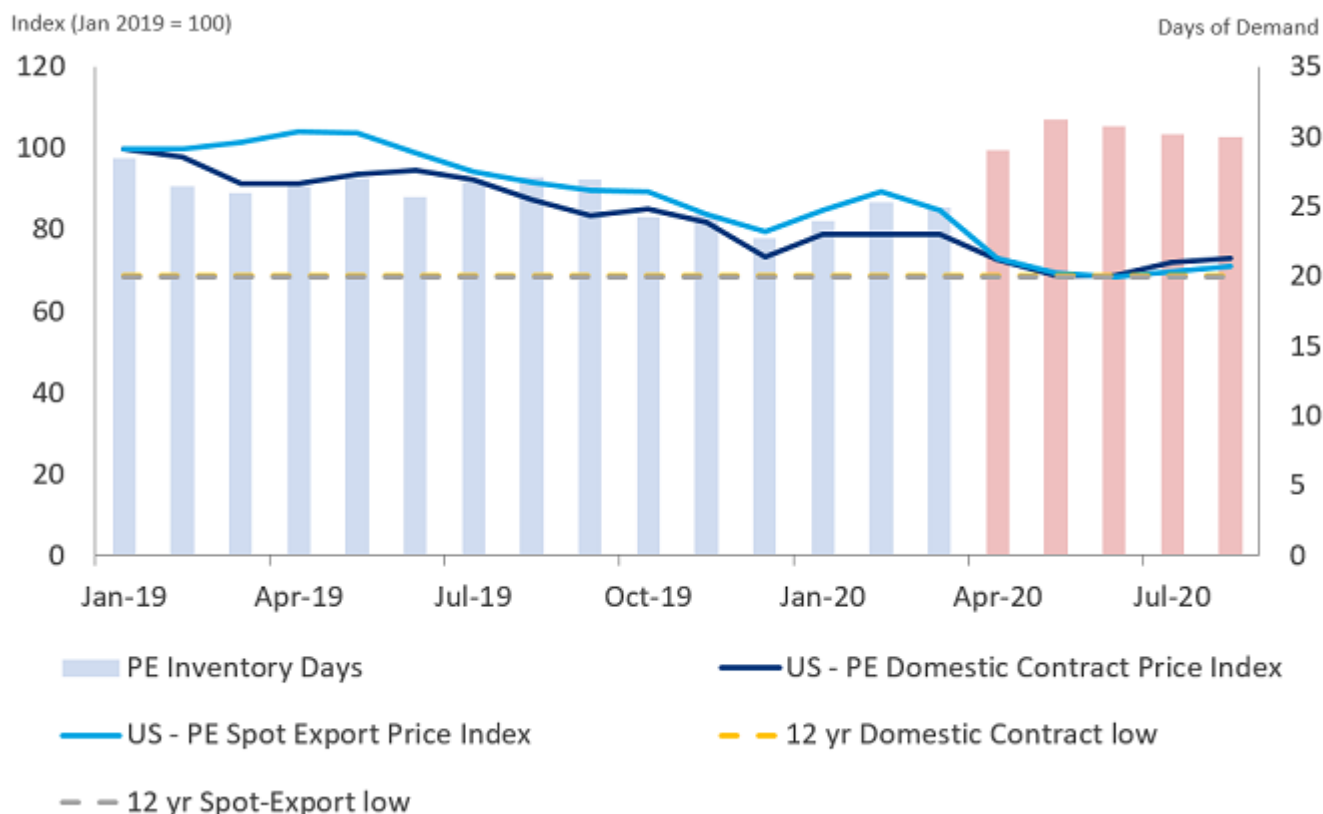
Rising US polyolefin inventories and their short-term effect on prices

Thomas Spagnoli, 08 May 2020

Issue

- In the new, post-oil price plummet environment, polyolefin (HDPE, LLDPE, LDPE, and polypropylene) feedstocks in the United States, ethylene and propylene, have both undergone a price drop of 32% in the past six months. This has incentivized high operating rates at polyolefins facilities throughout the US.
- Strong polyolefins production and coronavirus-dampened demand has meant producer's inventories in the United States have seen a sharp increase in April and are expected to see further increases in May.
- The crash in oil prices resulted in a loss of margin for ethane-based polyethylene assets and the impact of this has been seen both due to a drop in demand and loss of margin for a majority of United States polyolefins producers.

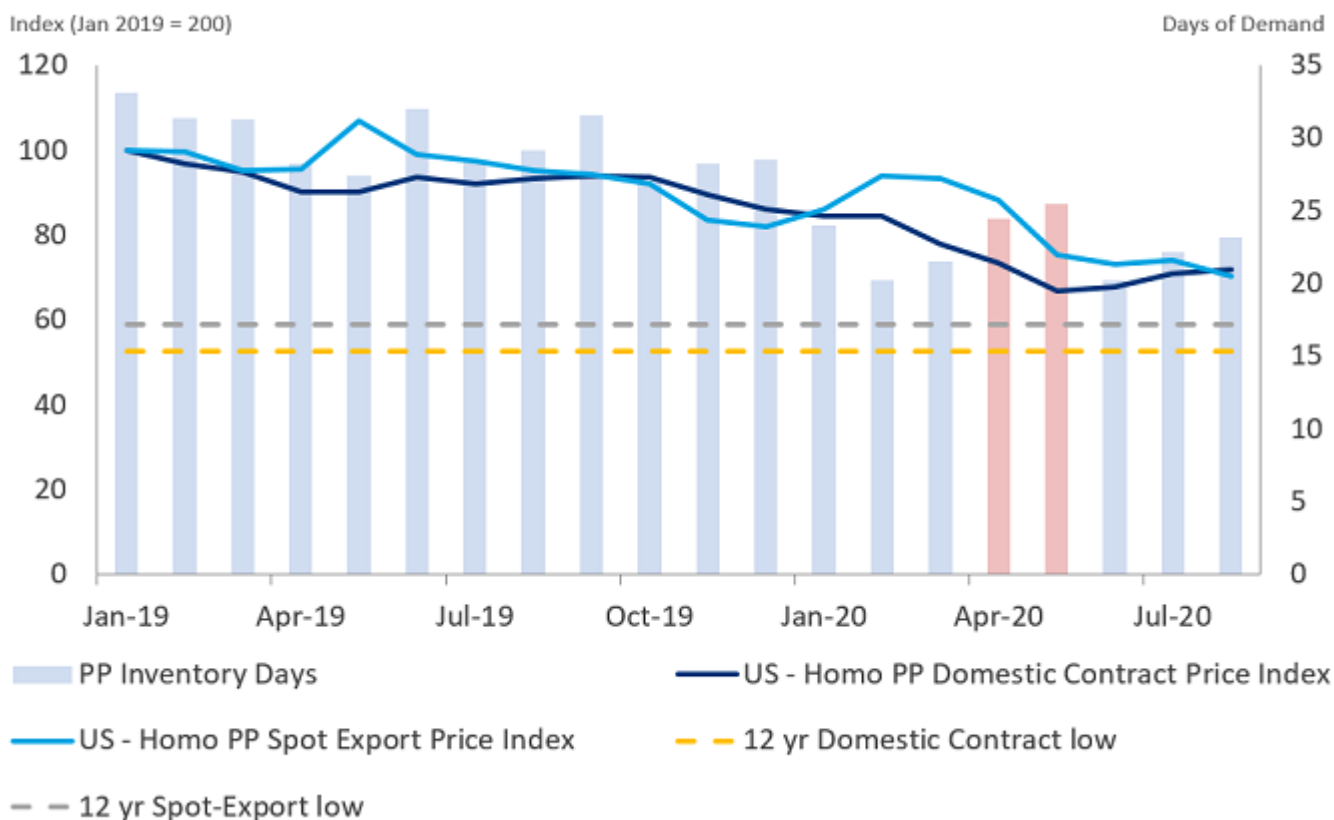
Polyethylene prices and inventories



Source: Polymerupdate.com, Wood Mackenzie Chemicals



Polypropylene prices and inventories



Source: Polymerupdate.com, Wood Mackenzie Chemicals

Implications

- The combination of elevated production and low global demand is resulting in high inventories, placing downwards pressure on polyolefin prices in the next three months.
- Producers would normally look to the export market in an attempt to clear inventories but will be unlikely to do so due to the current diminished state of global demand.
- Loss of competitiveness, thanks to low oil prices, and a pause in the automotive, construction, and consumer durable demand sectors are leading to temporary idling of polyolefins production facilities. For instance, Dow shut-down polyethylene production temporarily in Argentina and USGC. Many other facilities are evaluating reduced rates or switching polyolefins grade-slate to cater to "in demand" healthcare, medical and packaging sectors.

Outlook

- United States spot export Houston and domestic contract delivered polyolefin prices are expected to remain at or near their respective twelve-year lows throughout the next three months. The one exception would be domestic contract polypropylene, which is expected to begin recovery in June due to strengthening monomer costs.
- The effects of these low prices for both polyethylene and polypropylene are expected to be short-lived as global and domestic demand is projected to begin recovery in Q3, strengthening both spot export Houston and domestic contract delivered prices.
- As pent up demand from the automotive and construction sectors begins to hit the market in Q4, increases in pricing will be further supported.



- However, if the economic and social effects of the coronavirus continue longer than predicted (i.e. extended self-quarantining, social distancing in the workplace, and weak durable goods demand) then polyolefin price recovery will be pushed later into 2020.

Healthy polyethylene margins in China – is it sustainable?

William Liu, Ashish Chitalia, 07 May 2020

The collapse of crude oil prices has softened the blow dealt by coronavirus to petrochemical producers in China. Naphtha prices have fallen 70% since January 2020, and polyethylene has only fallen by 17% since January 2020. As such, the polyethylene-naphtha spread has gone from \$300/ton at the start of the year to nearly \$600/ton.

Against the background of global oversupply and coronavirus reducing the demand, how sustainable are polyethylene integrated margins? Find out [here](#).

OPEC+ oil supply cuts and the impact on ethylene supply

Patrick Kirby, Alan Gelder, Douglas Thyne, Ian Thom, 06 May 2020

The OPEC+ oil supply agreement commencing from the start of May 2020 aims to cut global supply by 9.7 million b/d.

The trend of ethane supply tracking oil supply adjustments has occurred historically and could resurface at a much larger scale as the world is heading into levels of unprecedented oil cuts. How do global oil supply cut locations map with ethane-based ethylene production assets? What is the shape of the oil supply curve in each of these key locations for 2020/2021? What could be the potential global impact on the ethylene industry and which locations are key?

[This insight](#) will look at the potential implications that global oil supply cuts could have on associated ethane supply and thereby the impact on the global ethylene market.

The coronavirus and China's polyesters: an update

Salmon Lee, 04 May 2020

In January 2020, we discussed how the polyester industry in China has come under pressure due to the spread of the coronavirus in the country. Between then and April, the pathogen's spread has morphed into a pandemic, and global economic growth has been badly affected. [In this update](#), we further analyse how the polyester markets in China are evolving amid the pandemic, and possible scenarios which could pan out for the rest of the year, and beyond.

Coronavirus and polymers - what does a stalling auto sector mean for polymer markets?

Andrew Brown, Timur Zilbershteyn, Guy Bailey, 01 May 2020

[In this week's edition](#) of coronavirus and polymers we present a focused review of the impact of coronavirus on the transportation sector - automotive specifically. The heavy exposure of engineered resins within the segment leave PA6 and PA66 most at risk from the slow-down across the industry.

Our modelling work includes several important updates primarily driven by a new macro-economic outlook. The total impact to demand is minimal, though some markets are more and less affected by the changes.



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The petrochemicals industry landscape is shifting at an alarming pace. Only one thing seems certain: the coming decade will be shaped by the coronavirus crisis. Consumer behaviour, investment decisions, the corporate landscape and even the path of globalisation will be influenced by its effects.

It's never been more important to have a wide view of the path ahead – while keeping a sharp focus on your key markets.

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