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Polyolefins trends in H1 2021:
New Asia capacity, unclear demand

Petrochemicals special report

February 2021

S&P Global
Platts

Petrochemicals

EXECUTIVE SUMMARY

The global petrochemical market will continue to feel the impact of COVID-19 in 2021 as business activities globally remain affected by the pandemic. Scientists' race to create vaccines effective against COVID-19 succeeded, though inconsistent rollouts have left many to expect uncertainty to remain at least through the first half of the year, and possibly into the third quarter.

"The business environment started improving in the second half of 2020. It will take some time to bring back the economy to pre-COVID-19 levels," Japan Petrochemical Industry Association Chairman Masayuki Wada said in January. Global petrochemical demand was severely hit by the pandemic in 2020 as downstream factories were forced to shut or lower operations. Lockdowns across the globe crushed demand worldwide, pressuring both petrochemical prices and production to record lows.

The World Bank estimated that global GDP contracted 4.3% in 2020, swinging from growth of 2.3% in 2019. In China, the key driver of global petrochemical demand, GDP grew only 2% in 2020 after expanding 6.1% in 2019. The global economy is seen back on the path to recovery in 2021. The World Bank forecasts global GDP to grow 4% in the year, while China's economy is forecast to grow 7.4%.

However, petrochemical producers are facing additional challenges. Some all-time highs have already begun softening and expectations of new capacity startups in some regions will bring more products to markets. In addition, olefins production margins are hit by crude-led strength in naphtha feedstock prices.

The upstream crude oil market will likely firm in 2021. So far in 2021, the CFR Japan naphtha breached the $500/mt mark on Jan. 7 for the first time since February 2020, S&P Global Platts data showed. The global petrochemical market is expected to see additional supply from China amid expanded capacities, which will likely pressure on spot prices. China's olefins exports will likely increase in line with the capacity expansions, with ex-China cargoes set to move to South Korea.

Political developments will also remain in focus, notably the US-China relationship under a Biden presidency. The US-China relationship worsened during the four years of the Trump administration as the US slapped duties on a variety of China-origin products in a bid to support US domestic industries. Some market sources expect the US-China relationship will improve under Biden, while others expect the status quo to remain as the US warily eyes an increasingly confident China. Only time will tell.

— *Fumiko Dobashi*

OLEFINS

Global ethylene length to weigh on markets in H1 2021

- **Demand appears lackluster pending COVID-19 vaccine**
- **US to remain key exporter, fully using new terminal**

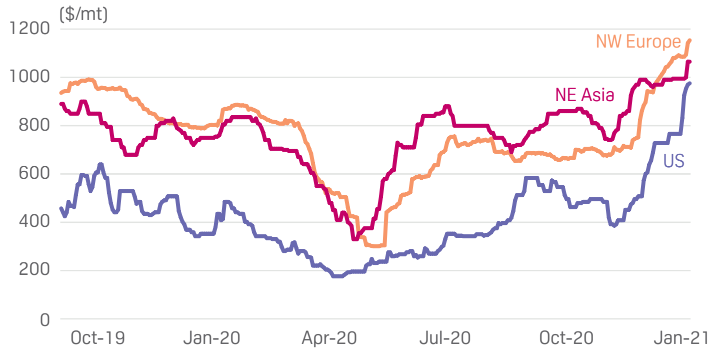
The global ethylene market faces further demand uncertainties while awaiting direction in the post-pandemic economic recovery in H1 2021.

The US and Europe will keep looking to send extra cargoes to Asia, seen to remain a key demand center, while maximizing use of Enterprise Products Partners' joint-venture terminal and supporting European cracker run rates.

"Demand is not bad now, but there is no confidence — the increase in demand did not happen in September as expected," a European source said. "There is plenty of C2 around, cracker run rates are being trimmed, no one wants to make spot C2, if you take two-three crackers down it won't show."

While the rest of the world looks to Asia to consume excess ethylene, Asian demand will heavily rely on global control of COVID-19, particularly with surges in other regions that pressure derivative export volumes. Most market participants were closely monitoring vaccine development and global economic recovery.

US TO CONTINUE MOST COMPETITIVE ETHYLENE EXPORTS IN 2021



Source: S&P Global Platts

Unplanned European outages remove surplus volumes

In Europe, unplanned outages removed surplus volumes by about 10% of the continent's typical annual capacity as of November. Underlying supply length will continue to weigh on the market in 2021, sources said, where "both imports and exports could be possible."

European ethylene prices had more than doubled to Eur600.50/mt ($712.49) FD NWE by mid-November 2020

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since hitting an all-time low of Eur278.50/mt ($330.40) in mid-May at the initial coronavirus peak. Since then, prices rose more than 50% to Eur903.50/mt ($1,093.14) FD NWE by the third week of January.

Europe will keep watching arbitrage with Asia for exports while competing with imports from the US and Middle East. That dynamic could restore price pressure for Asian ethylene at the same time Asian domestic supply recovers from unplanned outages by January.

Given Europe's supply shortages, the US was likely to remain a key exporter to Asia. After Beijing exempted an additional 25% tariff on ethylene in March 2020, China customs data showed US ethylene imports jumped to 20% in July from 1% in H1 2020.

In addition, Enterprise's terminal reached its nameplate 1 million mt/year capacity by the end of 2020. Before the terminal shipped out its first cargo in January 2020, US ethylene export capacity was 300,000 mt/year from a single terminal operated by Targa Resources.

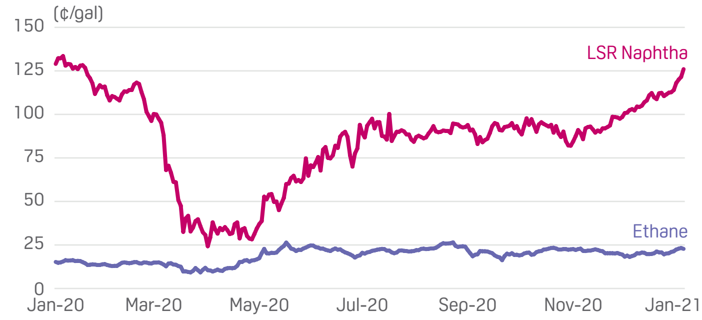
But by November, US ethylene export cargoes rose more than 128% on year to 568,741 mt, US International Trade Commission data showed. Outflows fell in August and September, reflecting hurricane-related outages, but remained well above 2019's 289,107 mt of exports

The spot FD Mont Belvieu ethylene price reached a 2020 high of 34.75 cents/lb Dec. 22, up from an all-time low of 8 cents/lb April 3 amid the pandemic impact, Platts data showed. Prices climbed further to 44 cents/lb in early January on multiple outages, but had retreated to 40 cents/lb by mid-January, Platts data showed.

Platts also launched an FOB USG ethylene assessment on Jan. 8, which quickly jumped to $1,006/mt on Jan. 11 from its inaugural $974/mt on Jan. 8, but retreated to $973.50/mt by mid-January.

Meanwhile, ethane has remained the dominant feedstock worldwide. US spot non-LST ethane prices reached a 2020 low in March of 9.25 cents/gal, more than doubled to 26.375 cents/gal by mid-June, ended the year at 21 cents/gal, climbed to 25 cents/gal by mid-January 2021.

US ETHANE PRICE ADVANTAGE RETURNS, WHILE MARGINS COME UNDER PRESSURE



Source: S&P Global Platts

ASIA'S STEAM CRACKER TURNAROUND SCHEDULE 2021

Country	Company	Location	Capacity ('000 mt/yr) Ethylene	Propylene	Turnaround dates
Japan	Idemitsu	Chiba	374	224	April, 2 months
	Mitsubishi Chem	Mizushima	495	320	May, 2 months
	Mitsui Chem	Chiba	600	331	Jul-Aug
South Korea	Lotte Chem	Daesan	1,100	500	Jul-Aug
	LG Chem	Daesan	1,270	450	May-Jul
China	Cnooc&Shell	Huizhou	950	500	Nov, 1.5 months
Taiwan	Formosa	Mailiao 1	700	350	Jun-Jul
	CPC	Lin Yuan 4	380	193	Mid Nov 2021 to Early Jan 2022
Malaysia	Ethylene Malaysia	Kertih	400	na	March
Thailand	IRPC	Map Ta Phut	360	312	March
Singapore	PCS	Pulau Merbau 2	655	350	July

CRACKER RESTART PLAN

Country	Company	Location	Capacity ('000 mt/yr) Ethylene	Propylene	Restart plan
South Korea	LG Chem	Yeosu	1,180	550	Jan-21
Malaysia	RAPID	Pengerang, Johor, Malaysia	1,200	600	H1 2021

Source: S&P Global Platts

While turnarounds in the US, Asia and Europe were planned for H1 2021, industry sources expect delays amid coronavirus social distancing safety protocols at least before summer.

Global ethylene margins to come off Q4 high as production increases

Ethylene prices rallied by the end of 2020 on stronger upstream prices, bullish ethylene derivative demandand unexpected outages in Northeast Asia and hurricane-related outages in the US.

US Gulf Coast spot ethylene price reached over $900/mt, the highest level in more than six years, buoyed by hurricanes and short covering, which closed export arbitrage out of the US to Asia and Europe. However, these high prices is projected to moderate over the course of 2021 as export volumes approaching 1 million mt is expected to flow out of the expanded Houston terminals in 2021. By the summer, the USGC spot price is expected to fall to $400/mt levels.

Margins in all markets are either at or exceeding their five-year upper boundary for January. Over time, USGC ethylene margins will slowly fall from highs of $400/mt seen in January to about half that by Q2 as production recovers.

European margins, which exceeded $600/mt at the end of 2020, are expected to maintain that range in Q1 2021 before falling to $300/mt levels mid-year. Western European ethylene production rose in 2020 compared with 2019, to take advantage of the high margins — a trend likely to continue into 2021 barring unexpected outages.

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EUROPEAN TURNAROUND SCHEDULE, H1 2021

				Capacity ('000 mt)		
Company	Country	Location	Type	Ethylene	Propylene	Timing
Sabic	UK	Wilton	Cracker	865	450	Oct 20-Q1 21
Exxon	UK	Fife	Ethylene plant	830	NA	Apr-21
PKN Orlen	Poland	Plock	Cracker	700	385	April-May 21
Versalis	Italy	Brindisi	Cracker	490	255	Q2 21
Total	Germany	Leuna	FCC unit	NA	200	May-June 21
LyondellBasell	Germany	Muenchsmuenster	cracker	400	190	2021

Source: S&P Global Platts

Asia margins will fall slowly from $600/mt levels in Q1 2021 to about half that in Q2. High Northeast Asia margins seen in 2020 due to unplanned outages in South Korea in 2020, will likely ease as production returns in Q1. Meanwhile, China is projected to require net imports of around 140,000 mt/month of ethylene in 2021, and will need to look beyond Northeast Asia for the cargo. Asia will see the highest ethylene price globally, which will likely attract imports from the US.

— *Kristen Hays, Ora Lazic, Astrid Torres, Chris Liu, Yi-Jeng Huang,*

Global propylene likely be fueled in 2021 by PP, economic recovery

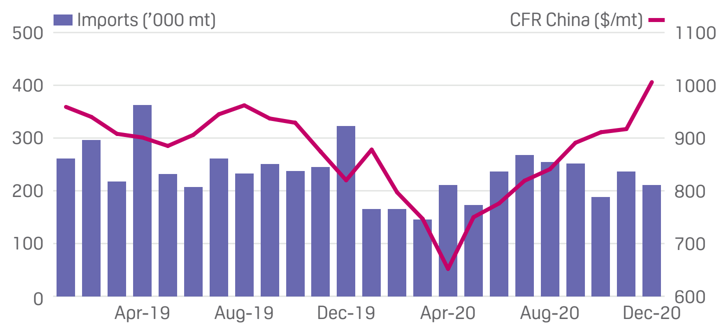
- **US-Europe arbitrage to remain closed**
- **China's imports to decrease amid rising self-sufficiency**

The global propylene market is likely be supported by firming demand from the polypropylene sector moving into 2021 as economic activity recovers as countries exit lockdowns and COVID-19 vaccines show promising results.

With a possible vaccine on the horizon, demand from the automobile sector could also be expected to increase as travel resumes, propylene market participants said. Supply tightness in some regions will also support the global propylene market.

In Europe, some cracker turnarounds were delayed from 2020 to 2021 due to labor and logistical challenges caused by the pandemic. At least four turnarounds are now planned for 2021, including some scheduled in the first half, which could reduce supply in the market.

CHINA'S PROPYLENE IMPORTS FALL IN 2020, SPOT MARKET RISES ON LIMITED SUPPLIES



Source: S&P Global Platts, China Customs

Participants also expect refineries in Europe to continue operating at lower run rates in H1 in view of reduced fuel demand as people travel less and continue to work from home. Lower refinery operating rates may impact the availability of propylene, particularly refinery and chemical grades.

According to S&P Global Platts Analytics, the operating rates of residue fluid catalytic crackers is likely to increase in 2021 from 2020 as gasoline demand picks up, but the increase will be limited. Analytics predicts RFCC operating rates in 2021 will average 79%-80%, up from 75%-76% in 2020.

In Asia, new downstream polypropylene startups in South Korea are expected to reduce the country's propylene exports.

Two PP plants owned by SK Advanced and Hanwha Total with a total 800,000 mt/year of PP capacity are expected to come on stream in H1, with no additional propylene capacity being added until H2. South Korea is the major supplier of propylene to China. "That means less export from Korea to China," said a South Korean producer, who added there would be a supply gap for propylene until new facilities came on stream in South Korea.

China supply increasing

Market participants will be closely monitoring the increase in China's new standalone propylene capacity in2021, as it will impact the country's demand for imports.

"In H1, plenty of new production is coming online, while the demand side is not as big as the production growth," an international trader said.

Oriental Energy is on track to finish building its new 660,000 mt/year PDH plant and two downstream 400,000 mt/year PP plants in Ningbo by January 2021, while Fujian Meide Petrochemical's 660,000 mt/year PDH plant is due to start up by end December and is expected to produce on-specification propylene by January 2021.

"If Fujian Meide is able to start its PDH plant on time this time round, it will reduce China dependence on imports," an International trading source said. Fujian Meide is

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China's largest propylene importer, and also purchases domestically to feed its two 500,000 mt/year PP plants.

China's propylene imports are expected to continue sliding in 2021 in line with its rising production capacity. The country's imports over January-October fell 19.5% year on year to 2.06 million mt, customs data showed.

Europe-US arbitrage

The flow of US propylene to Europe stopped in 2020 as US domestic prices rose, and market participants expect arbitrage opportunities to remain closed during H1 2021. An uptick in demand, lack of imports and scheduled outages could see propylene availability in Europe become tight, although this will be limited by the extent of the recovery in demand.

In the US, prices in the mid to high-30 cents/lb range in the second and third quarters shot up to 98 cents/lb in February, an all-time high since S&P Global Platts began assessing the market in June 1998, fueled by tight supply and high downstream demand, market sources said. That level was not expected to linger through the first half of the year, but the margin squeeze for most downstream products was expected to keep output tight.

Refinery operating rates

In the US, refinery-grade propylene or RGP prices fell to an 18-year low in Q1, driven by high refinery utilization rates. Domestic refinery utilization rates were at 82.3% at the time of the 18-year low, according to US Energy Information Administration data.

RGP prices recovered as rate reductions resulted in a tightening of upstream propane supplies, and supply of derivative propylene. Prices have remained steadily in the high-teens since Q3.

While there is uncertainty over COVID-19 restrictions in 2021, RGP demand may be driven up by increased road travel as people get "COVID fatigue" after the unprecedented restrictions of 2020, an RGP source said.

— *Abdulaziz Ehtaiba, Melvin Yeo, Astrid Torres, Eshwar Yennigalla, Fumiko Dobashi*

Butadiene demand recovery to battle fresh online capacity in 2021

- **New capacities to prompt Chinese exports**
- **European downstream to remain initially dependent on exports**

Global butadiene demand is expected to continue to recover in the first half of 2021, in line with increasing downstream tire and automobile production. However, Asia's spot demand may slow down in line with rising butadiene capacities.

"Petrochemical demand has remained resilient," Enterprise Products Partners' co-CEO Randall Fowler said in its third quarter earnings call. This was seen in butadiene and its derivatives in the latter part of 2020.

In the early part of the year, the COVID-19 pandemic slashed downstream tire and automobile plant operations, impacting the global butadiene market. In order to clear excess supplies, European suppliers actively exported cargoes to Asia, which pushed Asian butadiene prices to an all-time low in May 2020, according to S&P Global Platts data.

However, the butadiene market started to rebound in the fourth quarter of 2020, driven by multiple butadiene plant hiccups in Asia. In Europe, market sources have said that the bull run seen in the fourth quarter will continue into the first quarter of 2021, pulled by strong buying appetite in Asia.

European export prices rebounded from springtime lows of $50/mt to reach the $1,000/mt mark late-November, with arbitrage opportunities to Asia expected to continue into early 2021. However, such activities may end around the second quarter in line with rising new capacity in Asia and with the European domestic market yet to enjoy a prolonged rebound as seen in the Far East.

In Malaysia, Pengerang Refining and Petrochemical, or PRefChem, plans to restart its 180,000 mt/year butadiene plant in Johor in Q1 2021 following a fire at its refinery in March 2020. There are additional capacity increases expected in China, South Korea and Thailand.

Market sources said butadiene exports from China could increase in 2021 in line with rising capacities. In 2020, ex-China exports were heard mainly to South Korea. According to Korean customs, Korea imported around 4,000 mt of butadiene from China between January and October, two times more than a year earlier.

US supplies seen limited

In the US, market participants predict continued strength in pricing in H1 2021 due to the ongoing curtailment of supplies following TPC Group's explosion at its butadiene unit at Texas, Port Neches.

In early 2021, there will be many challenges for butadiene supply and the US will need to compensate through imports as automobile demand spikes, market sources said.

Downstream markets to remain under pressure

Synthetic rubber prices moved up in Q4 2020 in line with firmer butadiene feedstock prices, as well as firmer natural rubber. Asia's natural rubber market firmed in Q4 2020 due

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to a labor shortage created by the coronavirus pandemic. In addition, heavy flooding in southeast Asia impacted production. Southeast Asia accounts for more than two-thirds of global natural rubber supply.

The Association of Natural Rubber Producing Countries (ANRPC) forecast a 4.9% drop in global natural rubber supply in 2020, when compared with 2019.

Goodyear Tire & Rubber Company CFO Darren Wells said higher costs for butadiene and natural rubber were "the kind of snapback in price that we would expect... the industry is ramping up production or getting production back to pre-COVID levels."

Wells noted that, if production holds at current levels, the company could see raw material costs rebounding to 2019 levels.

In Europe, sources expected demand to continue to gradually improve, though remained wary about a widespread recovery in the synthetic rubber sector until the COVID-19 pandemic abated.

European synthetic rubber markets are expected to remain primarily driven by exports to Asia, initially with high run rates seen at the end of 2020 due to an open arbitrage east, amid stagnant domestic demand.

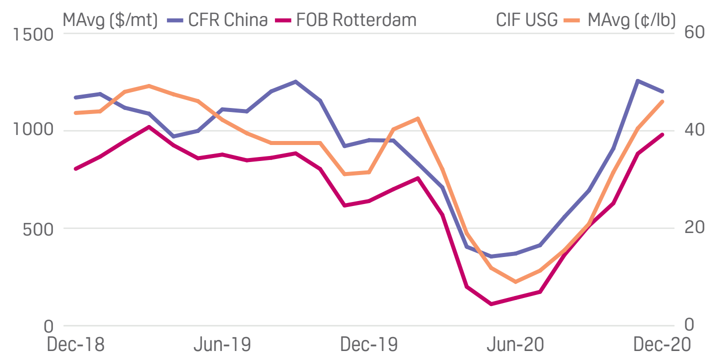
"There is a big question mark for next year. For a [tire market] return to pre-COVID levels, the 2024-2025 scenario is the pessimistic scenario and 2022 is the optimistic," one butadiene consumer said.

Market sources said butadiene demand should also come from ABS and NB latex, both of which have been enjoying positive margins, despite butadiene price rises in Q4 2020. NB latex has seen a boom from its use in medical gloves, with ABS also benefitting from medical applications.

In the European ABS markets, the lack of import volumes that drove market developments in H2 2020 is expected to continue in the opening months of 2021, fueling demand for domestic product, unless further coronavirus restrictions halt automotive and consumer appliance production. The return of imported material from Asia could rebalance the market but remains contingent on the gap between European and Asian ABS prices closing.

— *Luke Milner, Callum Colford, Astrid Torres, Fumiko Dobashi*

GLOBAL BUTADIENE MARKET REMAINS HIGH IN DECEMBER



Source: S&P Global Platts

NEW ASIA CAPACITY TO PRESSURE BUTADIENE MARKET

Company name	Location	Capacity ('000 mt/yr)	Startup date
Hengli	Dalian	140	Feb-20
Sinochem Quanzhou PC	Quanzhou	120	Sep-20
Sinopec Zhongke	Donghai Island	100-130	Oct-20
Liaoning Bora/Lyondell Basell	Panjin	120-140	Q3 2020
Wanhua Chemical	Yantai	50	Q4 2020
YNCC	Yeosu	130	Jan-21
BST	Map Ta Phut	80	end-2020
Sinopec-SK Wuhan	Wuhan	60	end-2020
PRefChem	Johor	180	Q1 2021

Source: S&P Global Platts

POLYMERS

Global PE markets expecting oversupply in H1 2021

- **New Asian capacity, restoration of US output post-hurricanes increasing output**
- **Coronavirus uncertainty leaves demand expectations unsettled**

Global polyethylene markets were expected to enter 2021 facing oversupply, much like that seen in early 2020, which could soften prices that soared when output tightened amid a one-two punch from 2020 hurricanes that hit the US Gulf Coast.

New capacity was on tap to start up in Asia, in addition to restoration of normal rates in the aftermath of US hurricanes that hit Southwest Louisiana and Southeast Texas in August and October.

While PE demand has been largely resilient throughout the global coronavirus pandemic, overall softness compared to pre-coronavirus levels was largely expected to linger as regions struggle with infection surges and continued unemployment.

"As we head into 2021, the numerous plant outages that started in the US Gulf Coast with Hurricane Laura and then expanded globally will come to an end," said Rob Stier, senior lead of petrochemicals for S&P Global Platts Analytics. "As capacity returns to the market, supply will increase and prices will come under pressure."

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Asia expecting stagnant demand growth

In Asia, about 5 million mt/year of new capacity was on tap to start up by the end of 2021, though some could be delayed. While that new capacity could create oversupply, sources said idling old, inefficient plants and lower global run rates could balance the market.

Asian market sources expect stagnant demand growth in the first half of 2021, with slowed spending caused by the pandemic.

However, demand growth was expected to rise by 4 million mt throughout the entire year, according to S&P Global Platts data.

Asia's projected PE output deficit was 18 million mt/year in 2021, with demand seen at about 61 million mt/year, according to Platts Analytics.

Of that net deficit, more than 8 million mt/year was HDPE, 6 million mt/year LLDPE and 4 million mt/year LDPE.

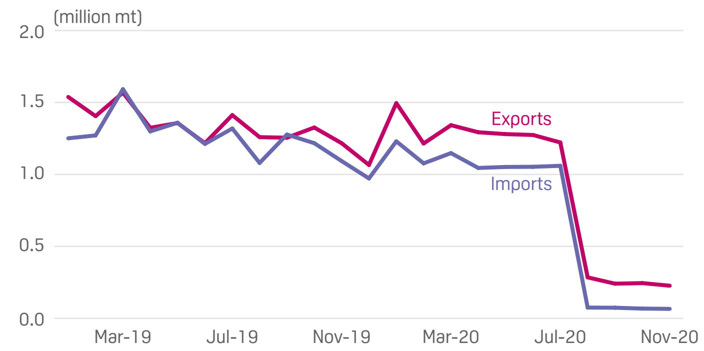
Asia PE demand in packaging, consumer and healthcare markets was expected to remain resilient in 2021. However, demand may remain weak for other sectors amid lower exports of finished goods and cash flow problems, leaving the overall pace of demand recovery uncertain in 2021, sources said.

Traders said the various economic stimuli by governments that had some effect in propping up markets were slowly running out, and export demand for finished plastic goods in Europe and the US were not seen recovered in early 2021.

Some sources expect normal demand to return by Q3 2021 at the earliest.

Traders also said they needed to review short- and long-term supply security in the aftermath of coronavirus lockdowns, including strategic stockpiling, just-in-time manufacturing, product diversification and incentivizing product substitutes

EU LDPE TRADE FALLS AMID COVID-19 PANDEMIC



Source: Eurostat

However, a container shortage in Asia and high freight rates were likely to reduce imports to India in early 2021, supporting prices there. Sources said India's manufacturers could increase prices through early February, when import flows were expected to gradually resume normal levels

Europe sees weak demand, tightening supply

The European polyethylene market was expected to be pulled in opposing directions by a combination of weak demand and expectations of tighter supply heading into 2021, amid stable pricing.

Converters and some traders were confident of gaining larger discounts on expectations of weaker demand amid a spate of second-wave pandemic restrictions, growing unemployment and expectations of a worsening macroeconomic picture.

At the same time, prolonged disruption from Hurricane Laura's August assaults was still limiting production — and exports — in late 2020. European producers were filling that gap by shipping PE to Asia, Latin America and Turkey.

Reduced European supply and more attractive export netbacks to those markets enabled domestic producers to maintain export volumes at better prices than they could achieve domestically, tightening supply further.

That said, market sources acknowledged that prices in Europe, already the lowest-priced region, could not to go any lower.

US sees continued uncertainty

US PE market participants expect pricing to weaken in the near term as more coronavirus-related shutdowns or restrictions impact the global economy.

"It's just so hard to pinpoint exactly but directionally I think we'll continue to move down products and start to connect the dots with these other overseas markets during the new year again," one export supplier said.

The US in Q4 2020 added new LDPE capacity from Sasol and Formosa Plastics USA after repeated delays, and aims to fully ramp up PE exports in the first half of 2021. Both plants combined will add 820,000 mt/year of capacity.

US PE prices and margins were expected to come under pressure as the region seeks to manage excess volumes and compete in foreign markets, sources said.

"The US will return to a major PE exporter and will have to lower prices to sell into international markets," Platts Analytics' Stier said.

Producers were expected to increase output as well, resulting in thinner spreads and lower US PE margins, according to one PE executive source.

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"There's going to be a lot of headwinds over the next 12 months," the source said.

— Kristen Hays, Hui Heng, Miguel CambeiroJacquelyn Melinek, Yi-Jeng Huang

Latin American polymer markets to enter 2021 with optimistic sentiment

- **Consumption recovery expected across region**
- **Prices to see mixed volatility until pandemic ends**

Latin America is expected to start 2021 with optimism regarding the coronavirus pandemic, as the scientific community signals that vaccines could be ready faster than anticipated.

The region was one of the most affected during the first half of 2020 and saw a quick recovery for the second half of the year, a trend expected to continue in the first half of 2021.

The pandemic surprised all players, but negative impacts expected for local economies were revised throughout the year as governments took action to mitigate the crisis. Plastic consumption is seeing strong demand entering the first half of 2021 after rebounding after an initial downturn.

The International Monetary Fund has revised its estimate for Brazilian GDP growth in 2021 to 2.8% from 3.6%, after revised its estimates for 2020 to a 5.8% decline from a 9.1% fall. Other regional economies like Argentina and Chile had stronger lockdown measures and slower economic recoveries, but are expected to enter 2021 with improved consumption as industries rebound to pre-pandemic levels. The IMF estimates Latin America's GDP will fall 8.1% in 2020 and grow 3.6% in 2021.

Those improved outlooks can be seen in Latin American polymers markets for 2021 as well.

Market players believe Latin America's automotive sector could boost polypropylene consumption in 2021. In Brazil and Argentina, vehicle production levels have recovered since May and normalized from August onward, while official associations have avoided making predictions for 2021. The sectors saw activity nearly halted in April amid widespread shutdowns to stem the spread of the coronavirus.

"Polypropylene prices will hold up better than polyethylene, but are expected to decrease by $100/mt or more over the next six months," said Robert Stier, senior lead for petrochemicals at S&P Global Platts Analytics.

The Latin American construction sector also largely stopped early in the pandemic, but soon saw strong recovery. The sector is expected to boost plastics consumption throughout the first quarter with the resumption of infrastructure projects.

In 2021, petrochemical run rates and demand across the region are expected to see increases compared with 2020.

"We expect South American ethylene and polyethylene fundamentals to look very similar to 2019 with respect to plant operating rates and net polyethylene trade," Stier said.

Higher demand, lower stocks

The industrial sector's struggle with a lack of feedstock was expected to extend into early 2021 before normalizing. Elevated demand in the second half of 2020 clashed with distributors' low resin inventories, prompting stronger prices for both imported and domestic material across the region.

Polyethylene prices in Brazil and West Coast of South America import markets should decline in the first half of 2021, Stier said, after declining since the start of November from all-time highs in September and October.

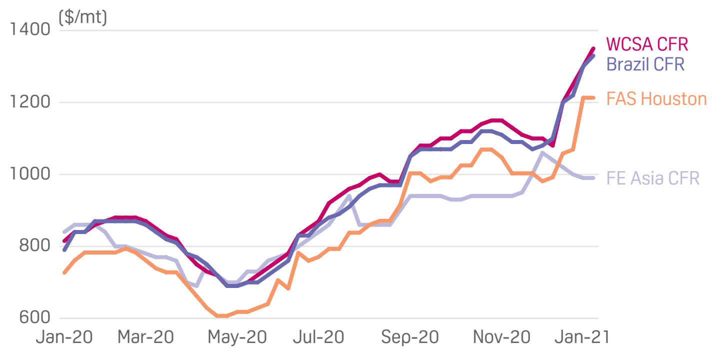
"By June, polyethylene prices are forecast to decrease by $200/mt from the current high levels which are a result of global outages starting with Hurricane Laura in late August," he said.

Brazil and the West Coast South America polyethylene import markets showed a fast V-shaped recovery, while prices lagged behind. Between May and June, prices reached record lows for both regions before shooting to record highs.

Market participants see no room for increases in domestic polyethylene prices in Brazil in early 2021 as Braskem evaluates currency exchange rates, local consumption and international price levels each month.

Polyethylene resins reached record-high domestic prices in Brazil in November, reflecting higher values in the import market and the strong devaluation of the Brazilian currency, the real.

LATIN HDPE BLOWMOLDING SEES RECORD LOW AND HIGH IN 2020



Source: S&P Global Platts

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Some players, however, were concerned that companies were still restocking inventories, possibly leading to a price rebound.

The expectation for 2021 is more stable currency values across the region, an important element for considering polymers imports.

The Brazilian Central Bank sees the exchange rate for the real ending 2021 at Real 5.20/$1 and, at the same time, the local annual interest rate up 1 percentage point, to 3% from the current 2%. Pandemic uncertainty caused the real to be one of the world's most devaluated currencies in 2020. The exchange rate started 2020 at Real 4.01/$1, considered high at the time, but surpassed Real 5.80/$1 in the first half of the year.

Brazil wasn't alone in facing currency devaluation. Argentina's currency devalued more than 30% and Colombia's more than 17%. Currencies in Chile and Peru were less affected.

In the Mercosur region, local distributors and traders believe limited product availability could continue until January, while expecting the situation to be solved soon as extra-zone materials are gaining market share. The region was mostly supplied by regional producers from Brazil and Argentina, high prices were not the issue as availability became nil during the latter half of 2020.

— Kristen Hays, Guilherme Baida, Flavia Alemi

Asian polypropylene production expansion to meet unclear H1 demand

- **New startups and ramp-ups to increase production capacity**
- **COVID-19 concerns remain as the market moves into 2021**

Asia, the US and Europe, three key global regions for polypropylene face distinct challenges in 2021 with the fear of fresh COVID-19 shutdowns looming, potentially threatening the seasonal uptick in Q1 re-stocking.

Issues with the shipping sector, a wave of production ramp-ups and support for the success and implementation of a vaccine are being watched closely by market participants.

Ample supply amid new startups in Asia

Asian polypropylene market participants have a bearish view and expect PP supply to be long in the first half of 2021 amid new startups, although some believe demand and economic recovery could lend a price floor.

A total of 5.95 million mt/year new PP capacities, mainly from China, are expected to be brought online in Asia and Middle East from end-2020 to H1 2021, including the restart of a 900,000 mt/year line from Malaysia.

This does not include the three Chinese PP plants started in Q3 2020 — totaling 1.55 million mt/year — which are in the progress of stabilizing and ramping up.

Nevertheless, some sources said the supply expansion impact on Asian PP markets in H1 2021 would depend on the actual progress of these projects.

However, the supply tightness seen in Southeast Asia and India in November should lessen in 2021, sources said.

Asian PP demand hinges on how the pandemic evolves, the potential success of a vaccine and economic recovery.

S&P Global Platts Analytics project Asia PP demand to rebound a healthy 6% growth in 2021 after dipping in 2020, as vaccines and other health measures deployed to combat the pandemic start to be felt.

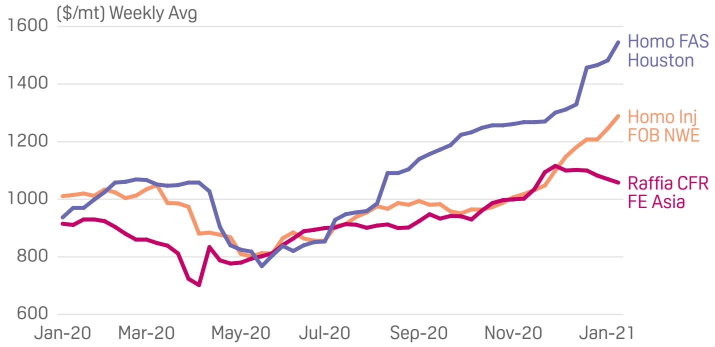
The automotive sector is expected to improve in some regions, even if a vaccine is delayed, as people are expected to prefer personal vehicles rather than public transport in the wake of the pandemic.

NEW PP CAPACITY IN ASIA TO PRESSURE MARKET

Country	Plant	Capacity ('000 mt/yr)	Expected startup
China	China Coal Yulin	400	Q4 2020 (tested)
China	Long You Chemical	550	Q4 2020 (partial)
China	Yantai Wanhua Chemical	300	Q4 2020 (tested)
China	Dongming Petrochemical Group	200	Q1 2021
China	Oriental Energy	800	Q1 2021
China	Sinopec Gulei JV	350	Q1 2021
China	Sinopec Tianjin PC	200	H1 2021
China	Sinopec Wuhan JV	300	H1 2021
China	Qinghai Damei	400	H1 2021
China	PetroChina Liaoyang PC	300	H1 2021
China	Zibo Haiyi	150	H1 2021
Oman	OQ	300	Q1 2021
Malaysia	Prefchem	900	Q1 2021 (restart)
S. Korea	Hanwha	400	Q2 2021
S. Korea	SK Advanced	400	Q2 2021
Total		**5,950**	

Source: S&P Global Platts

ASIA PP STARTS WEAKENING ON SUPPLY INCREASE



Source: S&P Global Platts

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Separately, limited container availability and high freight costs may support Asian PP in early-2021.

US enters 2021 with unresolved issues

In the US, PP resins for domestic and export use face supply uncertainty heading into 2021 after a tumultuous 2020 tightened resin availability. The second half of 2020 saw two hurricanes make landfall in the US Gulf Coast affecting PP operations in Louisiana.

Meanwhile, continued strong demand absorbed new plant production from Braskem America's new 450,000 mt/year nameplate capacity Delta PP plant in La Porte, Texas which came online on Sept. 10, sources said.

Domestic demand, driven by the medical and hygiene sectors, has kept fiber and injection grades tight throughout 2020 and this is expected to continue in early 2021.

Still export market players have dismissed higher-priced US pellets and looked globally for supply to meet customer demand.

While pricing has been firm for most of H2 2020, with spot pricing catching up to contract levels, it has been considered "unworkable" from the US to traditional import regions including Latin America.

The higher price levels coupled with a strong US dollar have had market participants looking regionally and even globally for resin. Spot polypropylene homopolymer export pricing rose 78% or $573 from the 2020 low of $739/mt FAS Houston basis May 15 to Dec. 15, according to S&P Global Platts data.

Additionally, a container shortage, congested US ports and a hike in freight to the Americas will present a challenge for market players.

Europe looks to more sustained recovery

The second wave of the coronavirus pandemic will likely continue to impact European PP demand in early 2021, although participants anticipate demand improving as countries end restrictions.

Levels of European PP consumption in 2021 will depend largely on the success of vaccination programs. Demand is generally expected to improve throughout H1, supported by strong demand for hygiene and medical applications while converters see demand from food packaging segments remaining steady.

The automotive industry experienced a stronger than expected recovery during the latter half of 2020 on the back of pent-up demand. Consumption of PP grades going into automotive and construction applications should improve in 2021, but deepening impacts of economic recessions across Europe remain a threat to car sales and the development of new construction projects, which may limit the extent of the recovery.

The availability of some PP grades tightened in the final months of 2020, as sellers looked to supply export markets rather than European spot markets given the more attractive netbacks on offer. Some planned turnarounds, delayed from earlier in the year, were pushed to Q4 2020, also trimming supply in the market.

Participants expect shipments of PP to continue flowing to export destinations in early 2021, which could keep spot availability limited. This has motivated some European buyers to consider increasing their contractual exposure for 2021.

— Emmanuel Gallegos, Miranda Zhang, Abdulaziz Ehtaiba, Shilpa Samant

Global PVC supply tightness to linger in H1 2021

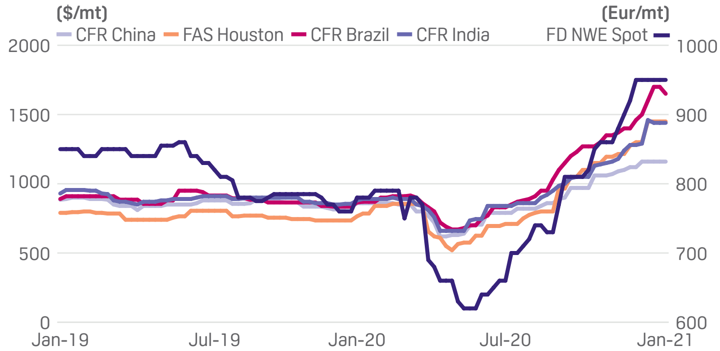
- **Hurricanes, forces majeures, operational issues crimp output**
- **Export prices to remain firm, could see some softening**

Global polyvinyl chloride demand and pricing have had a turbulent 2020 as the coronavirus pandemic initially crushed construction activity before sharp supply constraints revived it.

Going into 2021, those supply-driven highs that softened in January after force majeures were lifted could soften further after turnarounds wrap up and if Northern Hemisphere demand wanes as is typical going into winter.

However, the pandemic upended typical patterns where demand thins during winter months and mild weather has allowed construction activity to continue. Coronavirus second waves have continued to hit regions

GLOBAL PVC PRICES CONTINUE TO EXCEED RECORD HIGHS



Source: S&P Global Platts

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worldwide, and the global supply squeeze has lingered, with producers unwilling to ramp up chlor-alkali rates because caustic soda demand remains weak. And buyers keep coming.

“Consider this,” a US market source said. “If you have hungry people, giving them a morsel at a time, they’re going to remain hungry all the time.”

Supply squeezed throughout Americas

In the US, operational issues and a one-two punch from hurricanes in Louisiana siphoned supply from August through the rest of 2020, prompting Formosa Plastics USA and Westlake Chemical to declare force majeure. Market sources had expected supply to loosen up by November, but Hurricane Delta’s arrival in early October delayed restarts, and a string of government inspections as well as operational issues prevented Formosa from ramping up.

Those issues spread to Latin America, as turnarounds and one of those force majeures squeezed available upstream vinyl chloride monomer, prompting Mexico’s Orbia to cut rates. Brazil’s Braskem also cut PVC rates and had a brief shutdown because of operational issues and a lack of available ethylene dichloride feedstock from the US, prompting customers to swallow both a tariff and antidumping duties on US material.

The supply-driven squeeze pushed US export PVC prices from a 12-year low in April to an all-time high in December, the highest level since S&P Global Platts began assessing it in 1983. Prices in Brazil surpassed those in all other regions.

Market participants see that tightness lasting through the first quarter and into the second quarter of 2021 as Shintech’s expansion of output throughout the PVC chain has been delayed from March to mid-2021. Winter weather could tamp down some demand, but the push for single-family housing amid the pandemic remains strong and prices have yet to reach a tipping point.

“COVID has changed the landscape,” a source said. “Our business is suffering because of the lack of product and the unpredictability of what to do and what not to do.”

Asia sees price correction in Q2 with rising supply

Persistent tight supply is expected to keep Asian PVC markets stable to firm in the first quarter of 2021, with a price correction predicted in the second quarter as output rises.

However, Asian market participants do not see a steep downturn as demand would likely remain firm, particularly in India.

Asian PVC markets hit multi-year highs in the fourth quarter of 2020, driven by tight supply from the US as well as South Korea, prompting a rare fourth-quarter bull run that bucked typical seasonal demand declines.

India could also see upticks in early 2021, with buying appetite expected to rise amid economic recovery after coronavirus setbacks.

Tight South Korean supply is expected to linger in early 2021 amid an ethylene supply shortage, and that landscape is expected to keep key regional supplier Formosa Taiwan’s monthly offer prices firm in the first quarter after a $100/mt year-end increase.

“After the sharp price increase for December, Formosa would be unlikely to offer down for next few months,” a market source said.

Market participants were also closely monitoring the status of new PVC plants in China that brought 700,000 mt/year in new PVC capacity online in the second half of 2020 with off-spec output.

“These new PVC plants would likely start on-spec production early next year,” a trading source said. “In that case, there will be more PVC exports from China.”

However, sharp spikes in freight rates could stymie such outflows if the container shortage in Asia lingers, a market source said. By November, prices had reached $7,000 per export container in China, just for the space.

Europe looking to exports for continued support

Europe’s PVC industry is expected to enter 2021 with low stocks on top of ongoing supply shortages from operational issues and three forces majeures declared across September and October.

In addition, market uncertainty grew as European countries faced more lockdowns to stem coronavirus surges in the fourth quarter that prompted pre-buying and further upstream volatility.

Domestic European prices reached a 24-month high in November, while export prices reached a nine-year high that was nearly double the 2020 low of $600/mt seen in May.

However, by January, European supply and demand is expected to re-balance with less panic buying and production issues resolved, “once the value chain is filled again after the hole that was created in April-May,” a market source said.

In Turkey, a key European export market, global supply tightness pushed prices to a nine-year high as well in November, among some of the highest prices in the world.

However, general economic worries in Turkey remain, with the lira-dollar exchange rate and inflation worries

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dampening market sentiment. "Buying power is a question mark right now, and causing the imbalance in supply-demand fundamentals," a Turkish source said.

— Fumiko Dobashi, Ora Lazic, Kristen Hays, Stuti Chawla

PET/MEG

Global MEG length to weigh on markets in H1 2021

- **Demand dampened by recessionary pressures**
- **US to continue exports**

Monoethylene glycol prices are expected to come under further pressure in the first half of 2021 due to the forecast global recession, which will add to ongoing uncertainty over how increasing US production could be absorbed in Asia.

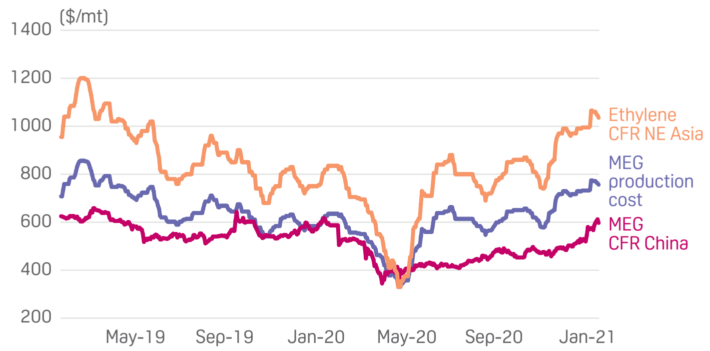
The potential for sharp price declines, however, remains limited, as weak margins would likely prompt the less cost competitive MEG makers to reduce rates, market sources said.

Several new MEG startups — particularly those based on coal-fed technology — are pending, with no launch dates as of yet, sources said. Indeed, there is growing uncertainty as to whether new MEG plants delayed from 2020 would be able to start by the first half of 2021, some sellers said.

Sources said they also expect weakening macroeconomics from an expected global recession in 2021 to dampen downstream demand from polyester textile to drinks packaging in the coming months.

Chinese converters said around 30%-40% of downstream industries manufacture for exports, adding that China alone could not sustain the additional MEG capacity growth.

NEGATIVE MEG MARGINS TO CONTINUE IN ASIA IN 2021



Source: S&P Global Platts

Downstream demand growth in the textile industry, impacted by global recessions after the coronavirus pandemic, is lagging behind additional MEG supply forecast at more than 1 million mt/year in 2021, one market participant said, adding that MEG suppliers will need to consider production rate cuts to maintain supply and demand balances.

US exports

Some market participants were also worried that, even if crude oil prices were to recover in the first half of 2021, MEG prices could remain under pressure given the higher levels of supply, especially from the US.

The sources said they were monitoring the situation for potential shifts in US-China bilateral trade flows, should there be new US regulations following the 2020 elections.

China remained by far the top recipient of US MEG, having received 608,564 mt in the first nine months of 2020, more than quadruple the 143,091 mt received in 2019, according to US International Trade Commission data.

US exports began to resume after plants returned to operations in late October, following a combination of hurricane-related shutdowns and turnarounds, traders said.

The oversupply and export situation in the US is expected to continue into the first half of 2021. The US is to add incremental capacity in the first half of 2021 and fully ramp up exports of MEG, some of it to Asia, traders said.

Taiwan's Nan Ya's new 800,000 mt/year MEG plant in Point Comfort, Texas, started up in December, earlier than initially expected, according to sources familiar with company operations.

ExxonMobil and Saudi Arabia's Sabic will also start up a new 1.1 million mt/year MEG plant in the fourth quarter of 2021 at their joint-venture petrochemical complex under construction near Corpus Christi, Texas, US.

European deliveries

In Europe, progress of an anti-dumping investigation into US and Saudi Arabian MEG imports to the region, launched Oct. 15 by the European Commission, remains a key consideration for market participants to watch for.

The Defense Committee of European MEG producers had earlier lodged a complaint on Aug. 31 that US and Saudi Arabia-origin MEG was being dumped in Europe at cheaper prices than material originating from within the region, affecting European quantities sold, as well as pricing and market share.

Market participants said they were holding off from signing term 2021 contracts for MEG supplies into Europe as they awaited the outcome of the investigation.

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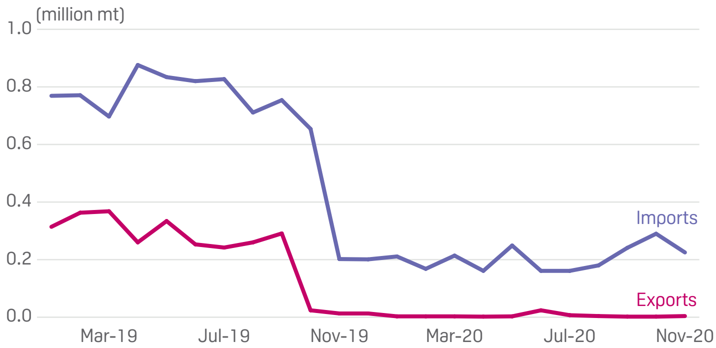
EU's MEG IMPORTS AND EXPORTS FALL AMID DUMPING PROBE



Source: Eurostat

Term contract negotiations were being held up because of potential additional duties and a lack of clarity as to who should bear the extra costs, one European supplier said.

"Who bears the duty? The (US/Middle Eastern) producer or the supplier (importer)?" one producer said. "Technically it is a supplier (importer) problem."

Any action by the European Commission against US and Saudi exports may result in a change in global MEG flows if European consumers start seeking supplies not subject to additional import duties.

Recent Eurostat data showed year-to-date 2020 EU MEG imports from the US were down 19% to 601,000 mt, while imports from Saudi Arabia into the EU down 52% to 753,000 mt.

A distributor said there could be the potential for swaps trading to develop as suppliers look to exchange product subject to any anti-dumping duties.

— Hui Heng, Miguel Cambeiro, Kristen Hays, Eric Su

Global PET to rebound in H1 2021 as economic activity picks up

- **Global PET fueled by demand recovery**
- **China PET on antidumping probe**

The global bottle-grade polyethylene terephthalate market could rebound in the first half of 2021 if demand recovers alongside an uptick in economic activity, should the coronavirus pandemic be tamed.

Bottle-grade PET demand may get a boost from the Tokyo Olympics due to take place in 2021, with large-scale sporting events traditionally lifting beverage consumption.

The return of sporting, music and other large-scale events in 2021 would push up demand after global bottle-grade PET markets sank to record lows in 2020.

Antidumping concerns spread in Asia

Asian PET producers are concerned about antidumping investigations in India and the US, which could push down demand for bottle-grade PET from Northeast Asia, notably China.

China has the largest share of PET production in the world, accounting for around 30%. Asia, excluding China, accounts around 21% of global production.

The US slapped antidumping duties on PET film from Brazil, China, Thailand and the UAE in September at 3.49-76.72%.

India is currently investigating antidumping duties on PET from China. The final findings are due to be announced on Dec. 31.

In December 2017, Japan slapped anti-dumping duties on Chinese PET resin at 39.8-53%. The duties are due to expire on December 27, 2022.

Meanwhile, Chinese PET is the target of an Indian antidumping investigation.

US to import more PET in 2021

US imports of PET are expected to grow in 2021 amid continued strong demand, hurricane-related disruptions, and limited truck availability.

Although on-the-go consumption of bottled beverages has fallen significantly since the start of the coronavirus pandemic in early spring, any demand loss in away-from-home channels was replaced, even outpaced, by increased multipack buying, and a surge in restaurant takeouts and delivery orders.

A shortage in aluminum can capacity due to stockpiling as well as increased demand for canned foods, particularly soups, also led many food and beverage companies to switch to PET packaging.

Robust demand, in addition to multiple facility outages in the third quarter, amid a record-breaking hurricane season in the US Gulf Coast, led to a significant drop in PET inventory levels and higher domestic prices by the fourth quarter.

"The fourth quarter is when demand is supposed to drop off so that inventory levels can recover," a source said. "That is not the case this year."

Operating rates increased from 89% in 2019 to 93-94% in 2020 to keep up with demand, the source said. Higher utilization rates are expected to continue into 2021.

To further compensate for depleted inventory levels, participants expect the US — already a significant net importer of PET - to have to rely heavily on imports. Although

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year-to-date imports through September were down nearly 100,000 mt year on year amid high ocean freight costs, imports from Mexico were up almost 10% year on year.

In general, US demand for PET is expected to remain strong throughout the first half of 2021 as participants remain optimistic that COVID-19 vaccines, as well as economic recovery, are on the horizon.

"I do expect if there is a vaccine by spring, we will see a boom in building, which would increase the [PET] polyester market," a Midwest broker said.

However, some market participants predict an increase in transportation issues in the coming years as trucking booking capacity becomes increasingly harder to secure as e-commerce retail platforms, such as Amazon, grow ever more popular.

Europe's demand recovery may be short-lived

In Europe, the news of COVID-19 vaccines has lifted market sentiment for 2021 but this is likely to be short-lived.

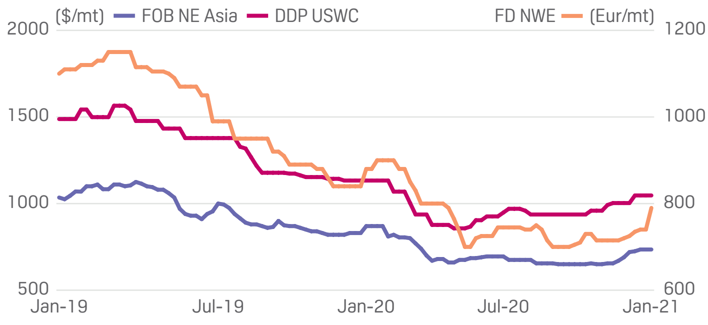
European PET producers said they do not expect a quick recovery as demand is likely to remain on the low side. With European economies affected by COVID-19 and people staying at home amid lockdowns, demand in the first quarter is likely to be lackluster, a producer said.

In the meantime, some European market players consider the potential of higher import prices raising spot prices in Europe at the beginning of the first quarter. "They [imports] will lift up prices regardless of whether they come at higher prices or don't come at all," the trader said.

Higher freight rates from Asia to Europe have lifted the prices of PET imports in the fourth quarter as container carriers implemented void sailings to restrict demand.

"If you buy now, arrival is in January, start of February," a European converter said, adding that some market players are currently buying to be on a safe side.

GLOBAL BOTTLE-GRADE PET PRICE PICKING UP AS DEMAND RECOVERS



Source: S&P Global Platts

Nevertheless, market sources say there is potential for prices to go the other way at the start of 2021. If everyone ends up with full stocks of resins and demand remains low, prices could be lower, the converter said.

The persistence of the coronavirus pandemic could absorb the impact of more expensive imports, other sources said.

— Luke Milner, Sarah Schneider, Alexander Borulev, Chris Liu

Container shippers hoping for rate relief in Q1 may have to wait

- **Trans-Pacific container rates expected to extend gains into January**
- **US import volumes to ease in Q1 but maintain year-on-year growth**

Shippers hoping for a break from escalating container rates in the new year may need to endure several more weeks of challenging market conditions before an increase in box supply in Asia balances with demand for available capacity.

Container freight rates may see an additional period of uplift for major routes from Asia in January as heavy congestion at ports in the US and Europe made it difficult to reposition equipment to export terminals in Asia. These shortages prompted shipowners to announce additional rate increases for January from what are already multiyear highs.

But major shipowners struggling to meet contract requirements amid a surge in Asia exports in the second half of 2020 are working to procure a much greater supply of containers from manufacturers and leasing companies to meet the unexpected shift in demand.

"The container shortages we are seeing were unexpected, and we have also faced shortages from having too many containers in the wrong places," Rolf Habben Jansen, CEO of German shipowner Hapag-Lloyd, said at a virtual forum on Dec. 9. "I expect the situation for Hapag will be close to normal in six to eight weeks from today. That is with the boxes already underway, as well as new boxes and new leasings coming in."

As shipowners get the equipment they need to meet demand, more capacity will come available and shippers will have more bargaining power to push for rate reductions.

"Next year we will see freight rates that are significantly below current levels. For now, shippers are trying to squeeze through much larger volumes than before," Jansen said.

Rates for the North Asia-to-UK Continent route saw the greatest uplift this year, more than quadrupling to $6,800/

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FEU on Dec. 17 from $1,575/FEU one year ago, with the biggest hikes implemented just in the past few weeks. Rates from North Asia to East and West Coast North America were up 114% and 189% respectively on year to $5,400/FEU and $3,900/FEU on Dec. 17.

All were the highest levels since S&P Global Platts launched the assessments in July 2017, but did not include additional premiums imposed on the spot market's freight all kinds (FAK) rates by shipowners to ensure on-time loading and delivery, particularly in the crunch just ahead of end-of-year holidays.

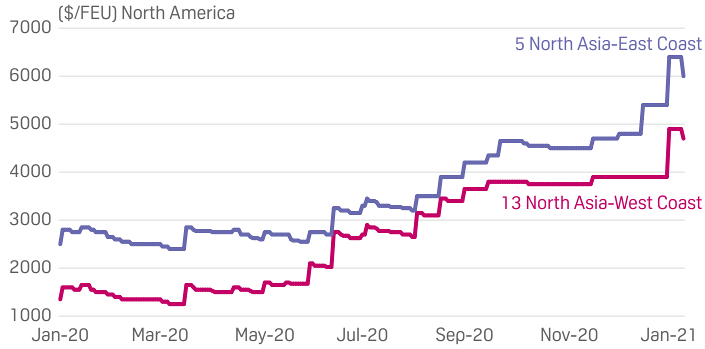
"Reliability to the West Coast US has fallen to the lowest in years," said a US-based shipper supplying IT equipment from Asia to the US. "For months you would have to pay premiums of thousands of dollars per box just to get on a ship, even if you had contract volumes with the carrier."

Trade data reflected the massive increase in demand for Asia exports as coronavirus pandemic-related lockdowns caused a fundamental shift in consumer spending in 2020 towards manufactured goods and away from services and travel.

US container import volumes across 12 major ports are on track to beat 2019 volumes as a peak season surge overcame a sharp drop-off in volumes earlier in the year, the National Retail Federation said on Dec. 9.

US imports are expected to end the year at around 21.8 twenty-foot equivalent units (TEUs), matching 2018 as the busiest year on record with an annual increase of 0.8% over 2019, according to estimates from the NRF's Global Port Tracker.

CONTAINER FREIGHTS CLIMB ON TIGHT AVAILS



Source: S&P Global Platts

Those volumes were particularly strong in the traditional third-quarter shipping season and likely peaked in September at 2.11 million TEUs, but total volumes in the first-quarter 2021 are likely to exceed those of the same period in 2020.

Many shippers have circled China's Lunar New Year holiday starting Feb. 12 as a time they hope that volumes will slow and enough empty containers can be repositioned in Asia that the worst shortages will ease. But China's typical autumn slowdown around Golden Week in October passed this year without any noticeable relief in export volumes.

"We are still booked up for several months out and big box retailers are still showing us very strong demand from January to March and beyond," a European shipowner said. "We are hearing from our clients that they are not looking to shut factories as normal around Chinese New Year and will retain that workforce. It might be like Golden Week where there is just a blip and then back to how it was going."

— *Greg Holt, Gary Gentile*

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