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Argus *Ethylene and Derivatives*

Formerly Argus DeWitt Ethylene

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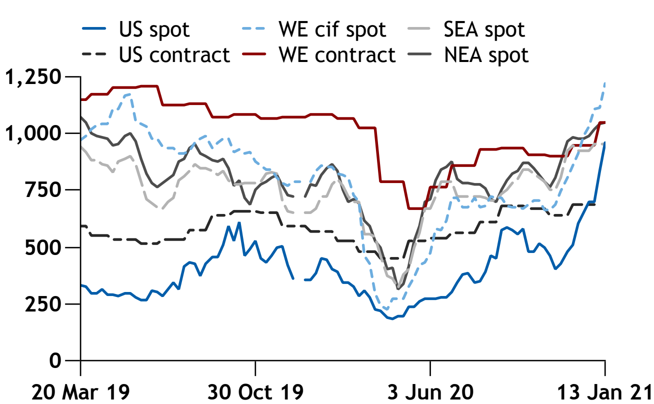
HIGHLIGHTS

Americas
- Spot ethylene climbs
- PE moves up further
- Demand for most ethylene derivatives robust

Europe
- European spot price reflects tight balance
- More than 60,000t of imports scheduled to arrive by mid-February
- Derivative demand remains good and inventories low
- Energy prices increase compared with December

Asia-Pacific
- China's ethylene prices fall on ample supplies
- PE producers cut offers to sell off inventories
- SM firms for second straight week
- China's PE and PVC demand slows

World ethylene prices *$/t*



MARKET SNAPSHOTS

Ethylene global prices				$/t
	Timing	Low	High	Mid
US				
Contract net transaction price	Dec			689
Pipeline del USGC spot		948.0	970.0	959.0
Month to date average spot prompt	Jan			921.8
Month to date average spot				756.6
Western Europe				
Contract MCP	Jan			1,051
NWE pipeline spot, del		1,172.8	1,257.9	1,215.4
Med spot, cif		1,180.0	1,265.0	1,222.5
NWE spot, cif		1,180.0	1,265.0	1,222.5
Asia-Pacific				
Taiwan contract	Nov			751
Southeast Asia spot, cfr		930.0	980.0	955.0
Northeast Asia spot, cfr		1,000.0	1,095.0	1,047.5
Northeast Asia spot, fob		980.0	1,020.0	1,000.0

Polyethylene global prices				$/t
	Timing	Low	High	Mid
US, del EOR, 7 Jan				
LDPE liner film HC	Dec			1,642
LLDPE butene-1 film HC	Dec			1,455
HDPE blow mold HC del	Dec			1,521
Western Europe, del NWE, 7 Jan				
LDPE liner film	Dec			1,599
LLDPE butene-1 film	Dec			1,392
HDPE blow mold HIC	Dec			1,356
Asia-Pacific, cfr CMP, 7 Jan				
LDPE liner film spot		1,350	1,380	1,365
LLDPE butene-1 film spot		1,000	1,020	1,010
HDPE film spot		980	1,000	990

Related feedstocks				
	Delivery	Low	High	Mid
Ethane Mt Belvieu non-LST *¢USG*	Jan	23.25	24.75	24.00
Propane Mt Belvieu non-LST *¢USG*	Jan	85.75	87.88	86.81
Propane ARA large cargo *$/t*		521.00	527.00	524.00
Propane Argus Far East Index™ *$/t*				651.25
Propane S China refrig cfr *$/t*	1H Feb	649.50	653.00	651.25
Butane Mt Belvieu non-LST *¢USG*	Jan	88.25	89.50	88.88
Naphtha full-range cif USGC *¢USG*		137.43	140.43	138.93
Naphtha 65 para NWE cif *$/t*		514.00	515.00	514.50
Naphtha Japan c+f *$/t*		524.50	528.50	526.50

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US/Canada

Spot ethylene assessments for prompt-month delivery to Mont Belvieu, Texas, rose by another 2¢/lb to 44¢/lb over the latest week, further increasing the premium over what could be supported by ethylene export arbitrage economics. Choctaw was assessed flat with the Nova Mont Belvieu location on Tuesday. The forward curve is steeply backward with February assessed more than 4¢/lb lower than January.

The Point Comfort, Texas cracker that went down in December is hoped to return to service by next week, while another Point Comfort cracker that had been on turnaround remains down. The crackers that had bobbles earlier this month are all believed to be running. A Lake Charles, Louisiana, cracker is slated to go down for a turnaround in the next few days.

Crude prices increased by 12pc over the past four weeks. Propane rose by 44pc, while butane was only up by 5pc. Light naphtha moved up by 19pc. Enterprise propane closed on Tuesday at 68.5pc of WTI, 15 points higher than four weeks ago. Ethane rose by 16pc over the past four weeks while natural gas was down by 20pc, pushing ethane's premium over natural gas at Tuesday's close up to 5.5¢/USG.

Propane has of course taken itself out as the desired crack, while butane is competitive with ethane, as ethane cash costs ratcheted up significantly higher. Butane was helped by rising propylene prices while other co-products relatively strong. The US remains significantly advantaged in the current environment with stronger crude and naphtha prices.

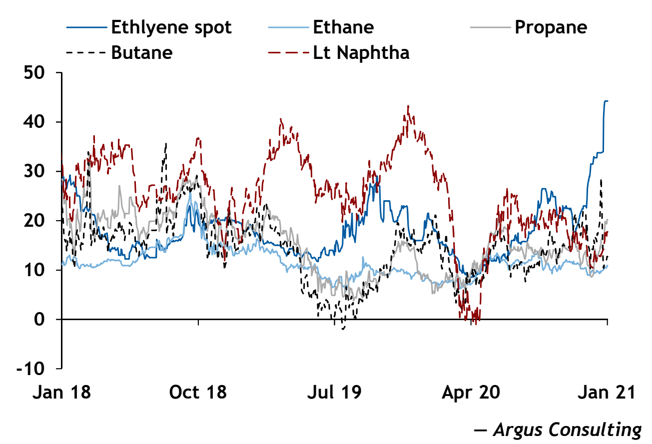
The arbitrage to move ethylene to Asia is closed, but is expected to open narrowly on average as the calendar rolls and terminal space is negotiated. The arbitrage to Europe is marginal and additional bookings to Europe could happen. US prices have most likely peaked, getting much higher than anticipated, but cannot remain in the current price range for long with some derivatives showing weakness in Asia. Enterprise and Navigator have started up their tank, greatly increasing the terminal's shipping capacity, but the limiting factor remains the volume of ethylene that can be guaranteed to supply the terminal. Both terminals are booked well into February.

Derivative demand is good. Weak caustic soda demand is limiting ethylene consumption for EDC, although polyvinyl chloride (PVC) demand is extremely strong. In EO/EG, two assets in Point Comfort are not running because of cracker problems and spot ethylene does not work at current MEG prices. In ethylbenzene/styrene, producers are running at full rates, although there may be weakness ahead as Asian styrene prices go lower and additional capacity starts up.

Polyethylene (PE) supply in January remains tight due to ongoing production problems as well as strong domestic and export demand. Formosa Plastics remains on force majeure on high-density polyethylene (HDPE) apart from bimodal high-molecular weight (HMW) film and bimodal HMW pipe products, following unexpected extruder issues at its plant in

US prices				¢/lb
	Timing	Low	High	Mid
Ethylene				
Contract net transaction price	Dec			31.25
Contract net transaction price	Nov			29.00
Contract net transaction price	Oct			30.25
Pipeline del USGC spot		43.00	44.00	43.50
Month to date average spot prompt	Jan			41.81
Month to date average spot	Jan			34.32
Related assessments				
EG fiber grade contract marker, exw		na	na	na
EG antifreeze, USGC spot		23.00	24.00	23.50
EDC export, fob USGC		21.00	22.00	21.50
Polymers, 7 Jan				
LDPE liner film HC del EOR	Dec			74.50
LLDPE butene-1 film HC del EOR	Dec			66.00
HDPE blow mold HC del EOR	Dec			69.00
PVC pipe HC del EOR	Dec			69.00

US ethylene cash cost vs ethylene spot *¢/lb*



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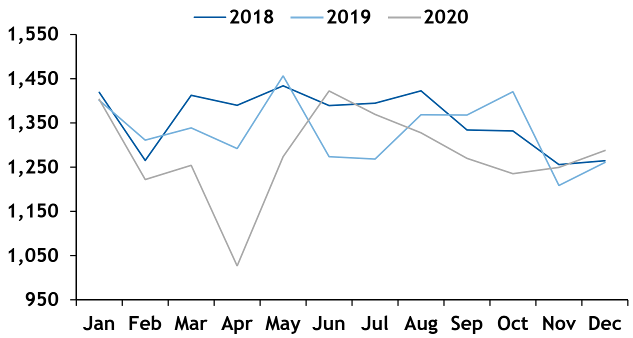
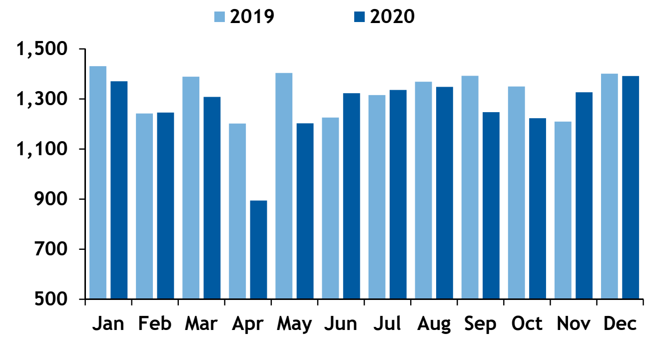
US/Canada PVC sales *mn lb*



— ACC/Vault

US Canada PVC production *mn lb*



— ACC/Vault

Point Comfort. In addition to the extruder problems, Formosa has been experiencing multiple cracker problems, which have left the company short on feedstock ethylene. Market participants have said the company is reserving its limited ethylene and only running its HDPE HMW line. The company is using inventories to take care of existing customers for other grades and has not needed to declare force majeure on those other grades. However, if the cracker problems persist beyond January, the company will struggle to meet all customer needs.

Braskem Idesa said last week that it has partially resumed production at its 1.15mn t/yr Coatzacoalcos, Mexico, PE plant based on an "experimental business model" following the December shutdown due to Cenegas cutting natural gas supply to the plant. It is not clear how much PE capacity has been restarted or how the company is getting feedstock for the plants.

Additional minor operating disruptions were reported, with HDPE blow molding the most affected.

Spot availability remains limited and prices for available volumes are up significantly from December levels. Contract buyers are largely getting their contract volumes, though there is talk of of railcar delays.

Demand in January remains strong, though there is a feeling that further price increases could lead to demand destruction. Multiple producers revised January price increase announcements higher from 3¢/lb to 5-6¢/lb, and at least one, Dow, has announced an additional 7¢/lb increase for February. Given the tight supply, sources have said some of the January increase could gain traction.

US PVC production in January is improving, with Westlake Chemical lifting its force majeure, which has been in place since last August, at the beginning of the month. However, while no active force majeures remain in the market, some producers are still running at lower rates as they try to balance out caustic soda supplies on the other end of the chlorvinyls chain.

Upcoming planned turnarounds at the end of February or early March by two PVC producers, combined with still stronger-than-expected domestic demand, will keep near-term PVC supplies tight.

US PVC production in December rose to 1.392bn lb, up by 4.9pc from November. That represents the highest monthly production total of the year, according to preliminary data from the American Chemistry Council's Plastics Industry Producers' Statistics Group and compiled by Vault Consulting. Plants operated on average at around 92pc of total capacity last month. Full year 2020 production fell by 4.5pc from 2019.

Total sales climbed to 1.288bn lb, up by 3.06pc from November, with domestic sales down by 8.5pc and exports rising by 50.9pc over the period. Exports represented 28pc of total sales, up significantly from 14pc and 19pc in October and November. Full-year sales dropped by 3.9pc from 2019. With output exceeding sales, producers added around 104mn lb to inventories in December, some of which is likely being built in advance of turnarounds later this quarter.

Demand in January remains strong, with strength in the construction sector, despite colder weather in much of the US. Sales of new single-family houses in November fell to a seasonally adjusted annual rate of 841,000, down by 11pc from the revised October level, but up by 20.8pc from November 2019,

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according to US Census Bureau data.

Export prices have held steady, with last discussions around $1,450/t fas Houston. While the price is well-above international pricing, it is still working to places like South America, which are facing container rates as high as $11,000 per container. That has made imports from cheaper places such as Asia impossible.

Latin America

Brazil's industrial production in November rose for the seventh consecutive month, gaining 1.2pc from October, with improvements in most sectors. Output fell by 5.5pc from January to November compared with 2019. Other factors point to economic weakness: The consumer confidence index dropped in January, unemployment rose, emergency aid for the poor wound down, food prices rose and the Covid-19 vaccine roll-out has been uneven. Ford Motor said on January 11 that it is closing its three plants in Brazil, where it has been operating since 1919. The company said the pandemic has amplified years of significant losses. Brazilians can buy cars made in Argentina, Uruguay and other nearby countries.

Brazil's ethylene supply has fallen from northeastern and southern crackers due to operating problems at some downstream units. In the northeast, the 26 December restart of soda-chlorine units in Maceio was interrupted starting this week for 10 days, limiting ethylene demand for ethylene dichloride (EDC). There are also output limitations at some polyethylene (PE) units and ethylene oxide unit production has been interrupted. In the south, polyethylene units are not running at full rates due to operational problems.

Polymers producers have been prioritizing the domestic market since last June, reducing exports, even at favorable exchange rates. Converters are struggling with high domestic and international prices, the real's depreciation and a sharp increase in international freight prices. R$/USD exchange rates are volatile. The R$/USD average rose by 4pc to 5.34 in January from 5.15 in December and is 29pc higher than in January 2020.

Naphtha is the preferred feedstock for most Brazilian crackers, supplied by state-owned Petrobras' refineries and imports. Petrobras has reached a five-year agreement with Braskem for supplying 2 mn t/yr of naphtha to the Sao Paulo cracker and to feed ethane and propane to the 580,000t/yr capacity ethylene cracker in Rio de Janeiro. Agreement for the naphtha needed to supply the southern and northeastern crackers was reached last June. Imports in December totaled 46,000t, with almost all coming from Argentina priced at $398/t fob. Total imports in 2020 fell to 2.683mn t, 50pc below those in 2019. Spain, the US and Angola were the three top sellers with 25pc, 24pc and 14pc of the total, respectively.

Brazil exported a 11,400t ethylene cargo in December that went to China priced at $544/t fob. Total ethylene exports in 2020 fell by 86pc to 23,400t, consisting of 17,700t that went to China and 5,700t to Taiwan.

Brazil's PE demand is strong and domestic prices in January increased R$300/t ($56/t) for high-density polyethylene blow molding (HDPE blow) and R$850/t ($159/t) for low-density polyethylene (LDPE). Prices were $1,926/t for HDPE blow and $2,437/t for LDPE. All other PE prices were stable in reals but fell in USD. High-density polyethylene injection is at $1,673/t, HDPE film is at $1,730/t and linear low-density polyethylene is priced at 1,913/t. .

PE imports in 2020 helped to balance the market, growing by 16pc from 2019 to 1.098mnt. In December, they rose by 40pc to 122,800t from December 2019, with most coming from the US at $998/t fob for LLDPE, $1,152/t for LDPE and $1,049/t for HDPE. Exports in December fell to 38,500t, down by 16pc from December 2019, with 8,000t going to Argentina at $1,190/t fob for LLDPE, $1,310/t fob for LDPE and $1,130/t fob for HDPE. December imports topped exports by 84,200t or by $84.8mn. Total Brazilian imports from January to December totaled 1.098mnt, exceeding exports of 698,400t by 400,000t or by $352.5mn.

Peru's PE imports rose by 48pc in December to 35,400t compared with December 2019, with 49pc of the total bought from the US at $1,067/t for LDPE, $939/t for LLDPE and $1,106/t for HDPE. PE imports from January to December increased by 11pc to 364,100t, with 59pc coming from the US, 10pc from Mexico and 9pc from Brazil.

Argentina's industrial production increased by 3.5pc in November from October and 4.5pc from November 2019, with improvement across almost all sectors. But output fell by 8.6pc compared with 2019. Argentina's PE imports in November fell by 13pc to 30,900t from November 2019. Imports of LLDPE were 12,300t, mostly from the US priced at $1,074/t CIF, while LDPE imports were 7,800t, mostly from Brazil at $1,385/t CIF. HDPE imports were 10,600t, mostly from Brazil at $1,209/t CIF. PE imports from January to November rose by 13pc to

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358,400t compared with the same period of 2019, with 47pc coming from the US and 36pc from Brazil. PE exports in November rose by 45pc from November 2019 to 19,000t, mostly going to Brazil priced at $763/t CIF. Exports from January to November increased by 64pc to 200,400t, with 84pc going to Brazil. The trade balance favored imports by 252,000t or by $310.8 mn in the first 11 months of 2020.

Chile's total PE imports in November fell to 29,200t, 12pc less than in November 2019. 49pc came from the US priced at $1,069/t for HDPE, $1,073/t for LLDPE and $1,057/t for LDPE. Imports from Brazil were 13pc of the total, priced at $1,097/t for HDPE and $1,128/t for LDPE. Imports in January to November rose to 379,700t, 19pc more than in the same period of 2019, with 45pc coming from the US and 29pc from Brazil. There were few exports.

Colombia's estimated PE imports were 33,600t in November, 9pc less than in November 2019, with 91pc coming from the US at $925/t for LLDPE, $1,040/t for HDPE and $1,041/t for LDPE. Imports in January to November rose to 438,900t, 7pc more than in the same period of 2019, with 80pc from the US. Exports totaled 2,800t.

Brazil's domestic polyvinyl chloride (PVC) demand is strong, and the resin supply needed to meet domestic demand is short. The two soda-chlorine units in Maceio restarted on 26 December after being down for 18 months but shut again this week amid operating problems. They are expected to come back on line in the next 10 days. Salt is being imported from Chile. Imports of EDC are helping to keep the two PVC units running. The country imported 26,300t of EDC in December, 32pc less than in December 2019, mostly from South Korea at $479/t fob. Total EDC imports in 2020 rose to 356,400t, 26pc more than in 2019. The US is the top supplier with 90pc of the total.

December's PVC domestic prices rose by between R$400 ($78/t) and R$500/t ($97/t), depending on the sector. Imports usually fill the deficit in Brazil's PVC capacity. Imports in December rose to 52,200t, 63pc more that in December 2019, with most coming from Colombia at $1,373/t fob. PVC imports in 2020 fell by 3.5pc to 406,400t from 2019. Net trade favored imports in 2020 by 348,700t, or by $362.6mn, over exports. Brazil's government is moving to ease the lack of resin by cutting the PVC import duty to 4pc from 14pc for three months, with a quota of 160,000t per quarter.

Oxiteno, Brazil's ethylene oxide producer, shut this week amid operating problem. The unit has plans for a 17-day turnaround in late February 2021. Ultrapar Participacoes, Oxiteno's owner, is considering strategic alternatives for its units, including a possible divestment. The company is bidding for refineries being sold by Brazil's state-run oil company Petroleo Brasileiro, which plans to focus on its oil and gas operations.

The two Brazilian styrene units are running hard to meet demand for polystyrene and in the rubber market, where domestic sales started to recover in September and remain firm. Styrene imports shrank by 41pc to 19,000t in December from December 2019 with almost all coming from the US at $658/t fob. Total imports in 2020 climbed to 238,000t, 22pc above 2019.

EUROPE

The European ethylene market remains very tight with limited spot availability. Material offered on the spot market is being sold at a 20pc premium to the January monthly contract price (MCP). It is still integrated producers who are bearing the brunt of the shortage, but inevitably even some of the contract parties are feeling the supply squeeze. Import tonnes are booked to arrive in the region through January and February. There are 60,700t nominated on vessels, with more likely to follow for February loading. The main source is the US but some buyers have found better value in the Middle East.

The roots of the current short market balance date back to September and October last year. Producers anticipating a much longer market at year's end supplied better-than-forecast demand from stock not increasing production rates. By November and December, when it was clear that demand was remaining much higher than anticipated, there was no scope to raise production and the market continued to suffer from a significant number of unplanned shutdowns and rate reductions. The percentage of capacity off line was 8.3pc in November and 8.2pc – according to *Argus* assessments – in December, with some of these issues persisting into January.

Integrated producers have managed their balances by cutting mainly internal demand and, where they could, some external contract volumes. But with on-going good order intake and low inventories, imports have been booked to cover short positions. US spot prices have risen to $.44/lb this week, which equates to more than €1,000/t cif NWE, which compared reasonably favourably with MCP +20pc and a February arrival – as things stand today – will benefit from a higher contract price in Europe. Six ships carrying 60,700t are booked to arrive in Europe from mid-January to mid-February, with a further two shipments likely to load in February. Logistically, getting this volume through the limited terminal space and into the system is a challenge in its own right, but it will alleviate the current shortages. Hopefully, the influx of material will not coincide with derivative issues that could quickly flip the market balance.

The high spot quotations are not reflective of the wider market and are based on a small volume, but it is an indicator of the tight prompt product balance. The MCP +20pc spot value is not affordable for all derivatives. PVC and LDPE can still make margin at this spot price for ethylene, but for most other derivatives it is either marginal or not workable. The other reason to pay this price might also be just to plug a gap, where the price is a secondary issue.

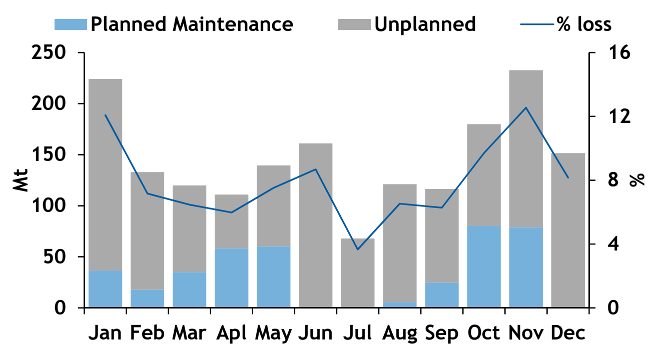
Operational production issues continue to plague the market. A cracker in the UK remains down but a cracker in Scandinavia has finally restarted after being shut down for eight months. There have been hiccups at two crackers in France, the UK and the Netherlands and at three crackers in Germany. Two other crackers continue to have issues that are reducing their operational rates.

Energy prices have risen since the start of this year, nullifying much of the January contract price increase. North Sea Dated crude oil prices have peaked at $56.06/bl on the prompt market, buoyed by the unilateral agreement of Saudi Arabia to cut production for January. Naphtha prices have followed crude and are already an average of €40.49/t higher than the December average. Naphtha prices are being additionally

Western Europe prices

	Timing	Low	High	Mid
Ethylene				
Contract MCP €/t	Jan			860.00
Contract MCP €/t	Dec			795.00
Contract MCP €/t	Nov			775.00
NWE pipeline spot, del €/t		965.0	1,035.0	1,000.0
Med spot, cif $/t		1,180.0	1,265.0	1,222.5
NWE spot, cif $/t		1,180.0	1,265.0	1,222.5
Related assessments, del NWE				
EG fiber grade contract €/t	Dec			590.00
EG fiber grade contract €/t	Nov			590.00
EG fiber grade contract €/t	Oct			630.00
Polymers, 7 Jan				
LDPE liner film €/t	Dec			1,303.0
LLDPE butene-1 film €/t	Dec			1,135.0
HDPE blow mold HIC €/t	Dec			1,105.0
HDPE injection mold €/t	Dec			1,095.0
HDPE HMW film €/t	Dec			1,125.0
PVC pipe €/t	na			na

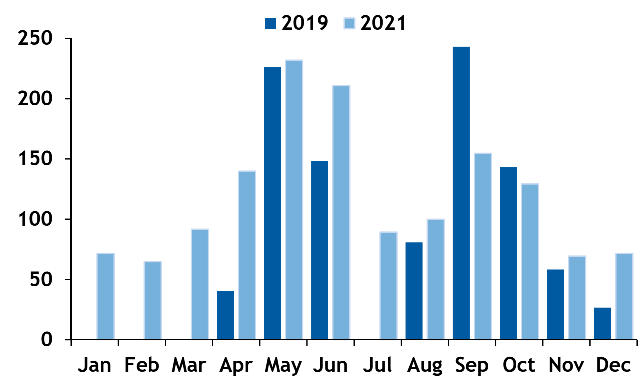
Planned, unplanned maintence WE 2020



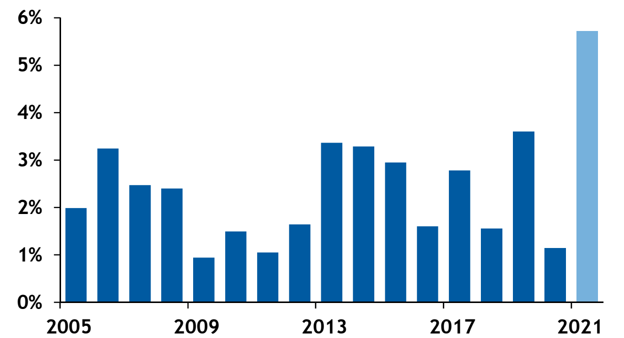
— *Argus Consulting*

EUROPE

2021 planned capacity loss compared to 2019 *Mt*



Volume off-line, planned maintenance *%*



— *Argus Consulting*

supported by reduced operating rates at most refineries and high utilisation of crackers, both because of the high ethylene demand and also because LPG prices remain relatively high. So far in January, propane has averaged a 5pc premium to naphtha while coastal butane has averaged a 6pc discount.

Looking forward to 2021, the planned maintenance programme is unprecedented — on the assumption that a UK cracker will be off line for the entire year. Almost 6pc of European capacity will be off line this year — the highest percentage and volume that *Argus* has recorded and significantly higher than the 2019 programme that was so disruptive. Comparing 2019 and 2021, although 2019 volumes off line were lower, they were more concentrated in terms of both timing and geography, with many of the largest crackers on the ARG on maintenance. In 2021, no single month is higher than September 2019, but every month is affected, leaving little respite for inventory recovery. As a consequence of the cracker maintenance programme in 2019exported364,000t and imported 328,000t. equating to a small net export. If our assumption is correct, Europe looks likely to be a net import market in 2021.

The PE market continues to be robust. Good domestic demand, coupled with higher-than-average exports, has resulted in exceptionally high demand at the end of last year. The expectation of a lower order intake at the end of the year means that the additional demand has been met from stock, and inventories are low through the supply chain. Imports remain low and, while producers are mindful of keeping European prices competitive with global levels, the tight PE balance in other regions and high logistical costs have pushed back the threat of import pressure into the second quarter and beyond.

LDPE is by far the strongest grade of the PE family, and prices are likely to increase by well more than the €65/t ethylene contract price. Other grades could see similar rises, especially if there is internal competition for ethylene within integrated producers.

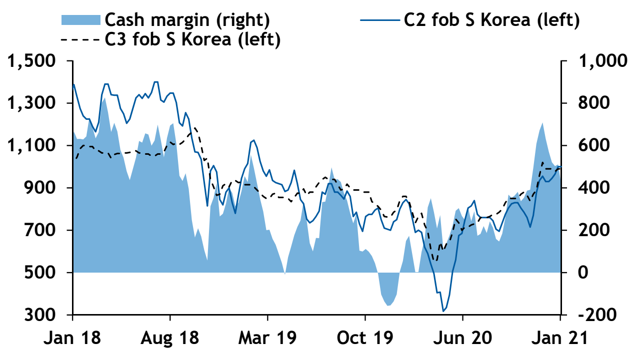
The PVC market continues to perform well above historic norms, in terms of both demand and volumes. Despite the majority of production issues having been resolved, the market is tight and stocks are low. Producers are trying to balance high demand against the need to build inventory for maintenance that will start at the end of the first quarter and without adding to the already-long caustic balance. So far, EuroChlor figures show that caustic stocks remained relatively stable into the end of last year. This might be difficult to maintain as the demand for PVC picks up though the spring — traditionally the peak season for PVC.

Producers started January targeting a PVC price increase of up to €100/t — well above the cost increase from ethylene of €32.50/t. The reaction from buyers is mixed, depending on their location. In areas where there are shortages, €100/t is rejected but increases of €60/t are not rejected out of hand. But in Germany, for example, buyers see no justification for rises of more than the monomers, given the increase in margins already achieved by producers over the past six months.

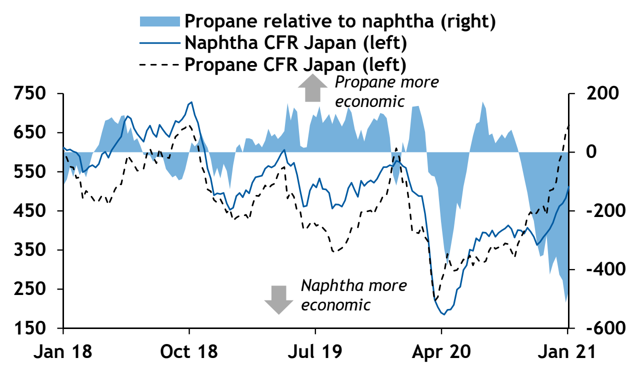
The December 2020 MEG contract price has settled retrospectively at €590/t, a rollover from November. The market has tightened because of shutdowns, both planned and unplanned, over the past two months, of ethylene oxide units and a shortage of ethylene at integrated producers. The ethylene oxide balance is further tightened by high freight and container rates for PET imports, supporting European PET operating rates.

ASIA-PACIFIC

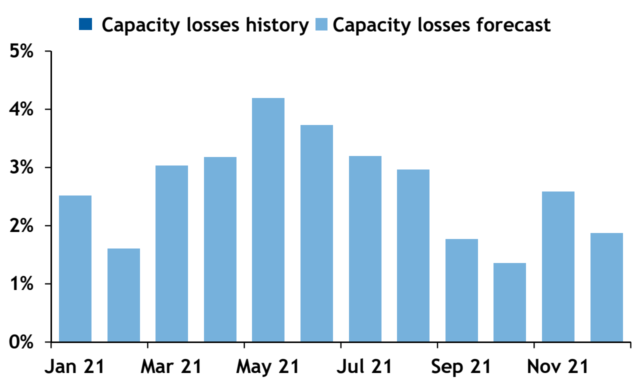
Asian cracker cash margin spot $/t



Asia cracker feedstock economics $/t



Asia ethylene capacity loss 2021 %



Asia-Pacific prices				$/t
	Timing	Low	High	Mid
Ethylene				
Taiwan contract	Nov			751
Taiwan contract	Oct			756
Taiwan contract	Sep			738
Southeast Asia spot, cfr		930	980	955
Northeast Asia spot, cfr		1,000	1,095	1,048
Northeast Asia spot, fob		980	1,020	1,000
Related assessments, cfr				
MEG contract	Jan	640	660	650
MEG contract	Dec	620	660	640
MEG contract	Nov	620	650	635
VCM NE Asia spot		1,040	1,100	1,070
EDC NE Asia spot		520	530	525
*preliminary				
Polymer assessments, cfr, 7 Jan				
LDPE liner film, CMP		1,350	1,380	1,365
LLDPE butene-1 film, CMP		1,000	1,020	1,010
HDPE injection mold, CMP		940	950	945
HDPE film, CMP		980	1,000	990
PVC pipe, SEA/China		1,000	1,150	1,075

Outages			
Shutdown	Plant	*KTA*	Duration
Restarted			
Map Ta Phut Olefins	Cracker	900+300	2Nov-16Dec
Sinopec SK Wuhan	Cracker	800	9Oct-25Dec
Luxi Chemicals	CTO	120	14Nov-endDec
Jiangsu Sailboat	MTO	360	2Dec-2Jan
Ongoing			
YNCC No2	Cracker	580 to 880	20Oct - 17-18Jan
Korea LG Chem	Cracker	1,160	5Nov to 20-24Jan
ENEOS Kawasaki	Cracker	540	4Dec-3Feb
Yangmei Hengtong	MTO	130	1Jan-15Jan
Shanghai Secco	Cracker	1,200	7Jan-13Jan
Petronas Rapid	Cracker	1,290	Mar20 - Apr21
Expected			
Ningbo Fund	MTO	300	18Jan, 12 days
Sinopec Fujian Refining	Cracker	1,100	4Jan 25 days, delayed
Sinopec Zhenhai	Cracker	1,000	10Jan 15 days, delayed
Petronas Kerteh	Cracker	400	Mar, 20-25 days
Hanwha Total	side cracker	300	Mar-Apr, 1mth
Sinopec Maoming	Cracker	640	1Mar, 65 days
Sinopec Yanshan	Cracker	820	31Mar, 45 days

Upstream and cracker margins

Naphtha prices rose this week to $512/t, up by $29/t from last week. Propane prices maintained their upward momentum, hitting the highest level since October 2018 of $659/t.
Hefty propane prices led to negative cracker margins this week of $51/t, down by $49/t. Naphtha remains the preferred feedstock because of healthy margins of $417/t.
Asian cracker turnaround plans are light for January-February.

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China's Sinopec Fujian Refining and Zhenhai Petrochemical have delayed their cracker turnarounds to February-March from January because of profitable cracker margins. Ethylene capacity losses are likely to fall further to 1.6pc in February from 2.5pc in January, as the three crackers in South Korea and Japan are expected to resume operations only by early February.

Ethylene

Deals and discussions:

- Deals: $1,060-1,095/t cfr Japan, January and February arrival, 4-5 lots
- Deals: $1,000-1,020/t fob China, January and February loading, two lots
- Offer: Low $1,000s/t cfr China, 8,000t Brazil-origin cargo, second-half February arrival
- Buying ideas: Mid- to high $900s/t cfr China for second-half February arrival
- Selling ideas: $1,050-1,1100/t cfr northeast Asia for February arrival.

Northeast Asia

The northeast Asian ethylene price range widened this week. The high end of the range was supported by spot purchases made by Japanese refiner Eneos last week and this week in a range of $1,060-1,095/t cfr Japan to cover its supply shortfall, following its decision to prolong a shutdown at its Kawasaki-based cracker until early February. The company is thought to have now covered most of its urgent requirements.

Buying interest from other regional consumers is weak at current price levels as demand slows. Buying ideas are mostly not exceeding $1,000/t cfr China for February delivery.

Offers for an 8,000t February-arrival Brazilian cargo emerged this week, with selling ideas in the low $1,000s/t cfr Asia. But there are no counter-bids so far. Buying ideas were only in the high $900s/t cfr China.

Regional market participants are monitoring closely the restart process at two South Korean crackers. YNCC is targeting to restart its 580,000 t/yr No. 2 cracker in Yosu on 17-18 January, while fellow South Korean petrochemical producer LG Chemical is aiming for a 20 January restart at its 1.16mn t/yr Yosu cracker.

Styrene monomer (SM) producers, faced with weak margins or plant issues, started a round of production cuts at the beginning of the year. Five Chinese standalone SM plants, with a total SM capacity of 1.17mn t/yr, had shut in the past two weeks, reducing ethylene demand by around 6,000 t/week. Non-integrated SM margins started to turn negative from late December, falling further to -$130/t at the beginning of 2021.

China's domestic ethylene prices continued to fall this week on ample supplies. Shandong-based coal-to-olefin (CTO) producer Luxi Chemical — after restarting its plant with 120,000 t/yr of ethylene capacity at the end of December — was selling at 6,800 yuan/t ex-tank, equivalent to $922/t on an import parity basis, early this week, a fall of Yn1,400/t or 17pc from last week. The firm on 13 January revised higher its prices to Yn7,100/t ex-tank Shandong, or $963/t on an import parity basis, after its inventory pressure eased. State-controlled Sinopec cut its listed price this week to Yn7,500/t ex-tank east China, or $1,017/t on an import parity basis, down by Yn700/t from last week in line with the general downtrend in the market.

Methanol-to-olefin (MTO) producer Nanjing Chengzhi held back ethylene sales this week because of weak margins.

Downstream outages

Shutdown	Plant	*KTA*	Duration
Shanghai Secco	SM	650	midNov, 45 days
China Abel	SM	250	earlyJan, restart unknown
Changzhou Dohow	SM	210	lateDec, a couple of days
New Solar	SM	300	earlyJan, 1 week
Shandong Yuhuang	SM	200	earlyJan, restart unknown
SP Chemical	SM	320	12Jan, 11days
Ningbo Keyuan No 1	SM	100	earlyJan, 15 days
Anhui Jiaxi	SM	350	18Jan, start-up
Sinopec SK Wuhan	LLDPE	300	15Oct-24Dec
Sinopec SK Wuhan	HDPE	300	16Oct-22Dec
Zhejiang Petrochemicals	HDPE	300	8Jan, 20 days
Shanghai Secco	HDPE	300	8-13Jan
Shanghai Secco	LLDPE	300	11-13Jan
PetroChina Daqing	HDPE	100	8Jan, a couple of days
Sinopec Sichuan	HDPE	300	12Jan, 5-6 days
Sinopec SK Wuhan	EO	200	7Oct-25Dec, to add 100kta
Sanjiang Fine Chemical	EO	100	10Dec-12Jan
Sanjiang Fine Chemical	EO	60	12Jan, restart unknown
Ningbo Fund	EO	50	15Jan, 15 days
Wanhua Chemical	EO	150	feed-in 10 Jan
Jiaxing Akzo Nobel	EO	85	endDec, restart unknown
Sinopec SK Wuhan	MEG	280	7Oct-25Dec
OUCC Yangzhou	MEG	500	cut rate to 40pc fr 2H Nov
Wanhua Chemical	VCM	400	29Nov on-spec
Ningbo Hanwha	VCM	400	14Dec-25Dec

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The company reduced operations at its No.2 MTO plant with 240,000 t/yr of ethylene capacity to 85pc this week from 95pc previously. With methanol prices at Yn2,480/t, ethylene and propylene's breakeven costs are both now close to Yn8,000/t. But ethylene prices in Nanjing have declined to around Yn7,500/t ex-tank and propylene prices are at Yn7,200/t ex-tank east China.

The excess ethylene supplies in China's domestic market are also a result of downstream plant issues. Private-sector cracker operator SP Chemical shut its downstream 320,000 t/yr SM plant unexpectedly on 12 January because of a mechanical problem. The company expects the shutdown to last for 11 days, leading to an ethylene surplus of 3,000t. BASF-YPC, a joint venture between Sinopec and German chemicals firm BASF, was also in the market selling ethylene for transport via road this week, after lowering its downstream 320,000 t/yr ethylene glycol operations by 10 percentage points to 70-75pc.

Two Chinese crackers had production hiccups last week. Sinopec SK Wuhan resumed full operations this week. Shanghai Secco shut its 1.2mn t/yr cracker on 7 January because of freezing weather. The company failed in its first attempt to restart the cracker on 8-9 January and achieved on-specification olefin production only on 13 January. Secco has shut its downstream polymer plants, along with the cracker, but is maintaining SM and acrylonitrile operations. There is a shortage of ethylene supplies of around 3,000t this week because of the unexpected production losses.

There is some emerging demand from new downstream standalone producers in China. Anhui Jiaxi is now aiming to feed its new 350,000 t/yr SM plant in east China's Anhui province on 18 January. The company has signed an ethylene term supply contract with Sinopec.

Southeast Asia

Indonesian petrochemical producer Chandra Asri experienced some hiccups at its 900,000 t/yr cracker last week. The company was in the market looking for ethylene, but it is unclear if any deals were concluded. The issues are thought to have been resolved and the cracker is gradually ramping up operations.

Philippine petrochemical producer JG Summit sold 3,500t of January-loading spot ethylene late last week, likely to Mitsubishi, although the prices could not be confirmed. Its PE unit is running as usual, and the ethylene was from its excess inventories.

Shell concluded a deal to sell a 5,000t cargo for end-January loading this week, likely heading towards Indonesia. Shell's downstream MEG unit was likely shut down unexpectedly, leading to excess supplies of ethylene, but this could not be confirmed.

Malaysia's Petronas also emerged to offer a 3,500t cargo for 25-27 January loading from Kerteh.

In Thailand, state-controlled trading firm PTT issued a tender on 5 January to buy 3,500-5,000t of ethylene for late-January delivery. The tender likely closed at a premium of $40/t against cfr southeast Asia assessments. Thailand is expected to be short of supplies until the start-up of PTT's new 500,000 t/yr cracker, likely around the end of January.

Market participants are now eyeing the Indonesian market because of a shortage of ethylene supplies in the country. Chandra Asri normally supplies ethylene to PVC and VCM producer Asahimas. But with Chandra Asri's cracker having technical issues, Asahimas could be looking for spot cargoes. The company has imported most of its ethylene from Mitsubishi, and the cargoes sold by JG Summit and Shell are also thought to be heading to Asahimas.

Mitsubishi won the latest tender from Saudi Arabia-based PetroRabigh last week offering 9,000t for 23-24 January loading. The cargoes have been sent to Europe.

Polyethylene (PE)

China's polyethylene (PE) prices remained slightly lower, despite higher futures prices on the Dalian commodity exchange. Producers lowered offers to sell off inventories because of worries of an earlier slowdown in demand this year. Some consumers plan to shut their plants in two weeks' time for the lunar new year holiday, earlier than in previous years. There are also rising concerns about increasing Covid-19 cases in Hebei province, which have hampered logistics in the northern China region and weighed on local demand.

But some distributors are more positive about the market, expecting restocking activity to pick up in the next two weeks as recent domestic plant shutdowns and lower import supplies may drive up spot demand for replenishments.

Zhejiang Petrochemical shut its 300,000 t/yr HDPE unit on 8 January for a 20-day maintenance. Sinopec Sichuan has been having maintenance at its 300,000 t/yr HDPE plant since 12 January, which will take 5-6 days. And Shanghai Secco took off line its 300,000 t/yr HDPE unit on 8 January and its 300,000 t/

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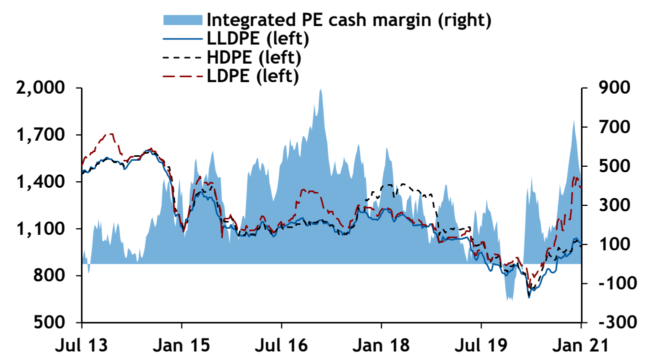
Asia integrated PE cash margin $/t



yr LLDPE unit on 11 January because of production hiccups at its cracker. The company was gradually ramping up PE production on 13-14 January.

Domestic prices for linear low-density polyethylene (LLDPE) edged down to Yn7,650-7,90/t ex-works in east China, a Yn50-150/t decline from last week. Converters are adopting a wait-and-see approach and purchasing only on a need-to basis, attributed to uncertainty in the demand outlook around the spring festival holiday. Prices for low-density polyethylene (LDPE) fell to Yn10,400-11,100/t ex-works, Yn100-300/t lower from a week ago. The price difference between LDPE and LLDPE narrowed to around Yn3,000/t from a peak of about Yn4,000/t in late November, following the addition of Yanchang China Coal's new 300,000 t/yr LDPE line that started up at the end of December. High-density polyethylene (HDPE) prices also dipped to Yn7,600-7,850/t ex-works from Yn7,700-7,900/t previously amid weak sentiment.

Producers are having no inventory pressure so far. Inventories of PE and polypropylene at China's state-owned Sinopec and PetroChina were at 620,000t on 13 January, 25,000t lower than the previous week.

On the cfr China front, prices were stable to weak. Trades were limited because import prices remained higher than domestic prices. Prices for LLDPE were rolled over at $1,000-1,020/t cfr China. Offers of Middle East cargoes were quoted at $1,000-1,040/t cfr China, with few deals closed at this level. US-origin material was offered at $1,020/t cfr China. And some offers for February-March delivery of Thai material emerged at $1,010-1,020/t cfr China. LDPE prices held steady at $1,350-1,380/t cfr China. Some Russia-origin cargoes emerged at $1,350/t cfr China, while offers of Middle East material were quoted at $1,350-1,380/t cfr China, which attracted little buying interest. And some March-delivery Indian cargoes were offered at $1,330/t cfr China, with no deals yet.

HDPE film prices dipped to $970-1,000/t cfr China, a modest decline of $10/t from the low end of the previous level. Offers of Middle East cargoes were quoted at $970-1,030/t cfr China. And offers of South Korea-origin material were at $995/t cfr China. HDPE injection grade prices held steady at $940-950/t cfr China amid continued muted discussions. And HDPE blow-molding grade prices fell to $970-1,000/t cfr China from last week's level of $980-1,010/t cfr China.

Ethylene glycol (MEG)

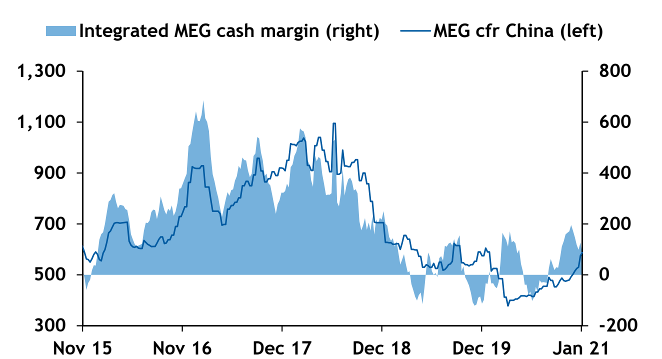
Asian ethylene glycol (MEG) traded higher during the assessment week, but there were limited deals. Low availability of prompt shipments curbed discussions.

The Chinese import market was quiet from last Wednesday to Friday. There were sporadic offers to sell February shipments at $590-595/t cfr China. Slow downstream PET fiber sales had weakened sentiment. Buyers placed counter-bids at around $580/t cfr China, and deals for several cargoes were done at around $580-585/t cfr China.

Sentiment subsequently warmed, supported by a firmer MEG futures market. Lower MEG inventories at east China's main ports also helped support prices and led to more enquiries for February shipments.

Most sellers are unwilling to make offers on expectations that the prevailing supply-demand balance will support MEG values. Operating rates in the polyester sector are also expected to remain comparatively high during the lunar new year holiday.

NEA MEG integrated cash margin $/t



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Selling indications rose to $595-600/t cfr China, meeting bids at $590-595/t cfr. Discussion levels reached $595/t cfr China on Tuesday.

China's domestic MEG prices were stable from last Wednesday to Friday, in line with a steady futures market. Several firms concluded January shipments at around Yn4,400-4,450/t ex-tank.

The unexpected decline in MEG inventories lifted futures and physical prices over Monday to Tuesday. Discussion levels gained by more than Yn100/t to reach Yn4,550-4,560/t ex-tank before the close of trading yesterday.

The cold weather in east China slowed discharges of imported MEG last week. Inventories at east China's main ports declined to 737,000t, a 80,000t fall from last week and the lowest level since February 2020.

On the production front, Yangzi-BASF lowered MEG operating rates to around 70-75pc because of squeezed production margins. Zhongke Zhanjiang restarted its 400,000 t/yr MEG unit last week after an outage at the end of December. China's syngas-based MEG producer Xinhang Energy restarted its 400,000 t/yr MEG unit this week. Operating rates were at around 60pc.

Guizhou Qianxi restarted its 300,000 t/yr syngas-based MEG plant recently after a week-long maintenance. China's syngas-based MEG operating rates are slightly higher at around 53pc.

Ethylene oxide (EO)

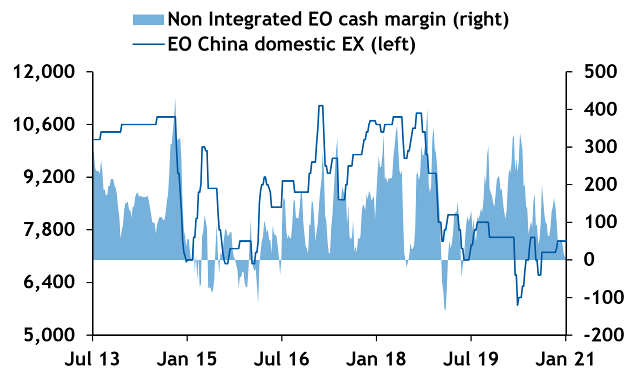
Ethylene oxide (EO) prices in east China were stable at Yn7,500/t ex-tank. Prices remained unchanged for an eighth consecutive week, during when upstream ethylene prices rose by 8pc.

As a result, non-integrated EO margins in China are squeezed and have dropped to zero since the beginning of the year. This compared with average margins of $40/t in December and $150/t for the whole of 2020.

Some smaller standalone EO plants were forced to shut in January because of weak margins, including Akzo Nobel's 85,000 t/yr and Sanjiang Chemical's 60,000 t/yr lines. Ningbo Fund will have a turnaround at its MTO plant and downstream 50,000 t/yr EO unit in mid-January for half a month.

But China's domestic supply is still increasing from integrated producers. Wanhua Chemical fed its new 150,000 t/yr EO plant early this week, expecting to reach on-specification production in the coming week. Sinopec Zhongke has ramped up its new 250,000 t/yr EO plant to full load from 70pc previously.

China EO non-integrated cash margin $/t



Demand remains slow, particularly in the water-reducing agent sector, which consumes half of China's EO supplies. Winter is usually the lull demand season for the water-reducing agent sector as cold weather deters construction projects. A resurgence of Covid-19 cases in Hebei province has also curtailed EO demand from the local market.

Styrene monomer (SM)

The styrene monomer (SM) market in Asia-Pacific firmed for a second consecutive week. SM prices started to dive from mid-November, but have been recovering since the start of 2021.

Asian prices are the lowest globally. There have been no offers throughout the assessment week as the arbitrage from Europe and the US is shut, depriving the region of overseas imports and giving prices more upside potential. The upward track in China's domestic market also boosted cfr China prices, after some plants in China reduced operating rates since a week ago to cope with production losses. China's domestic prices held in a range of around 6,600-6,800 yuan/t, or about $895/t on an import parity basis, through the week, before increasing to Yn6,850/t, or almost $920/t on an import parity basis, on Wednesday.

February bids stood at $905-910/t cfr China and March bids were at $915-925/t cfr China, without finding any offers until Wednesday when Singapore-based Shell Chemicals offered a first-half March arrival cargo, making it the first offer for the

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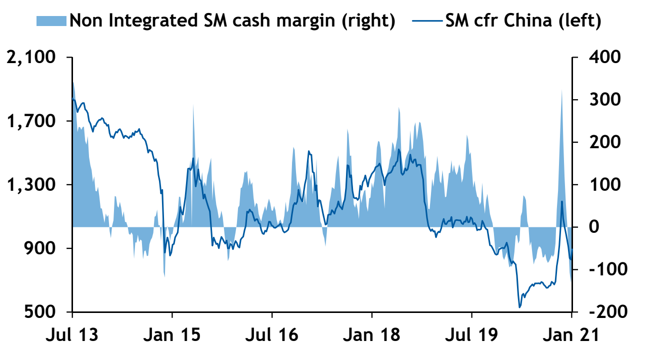
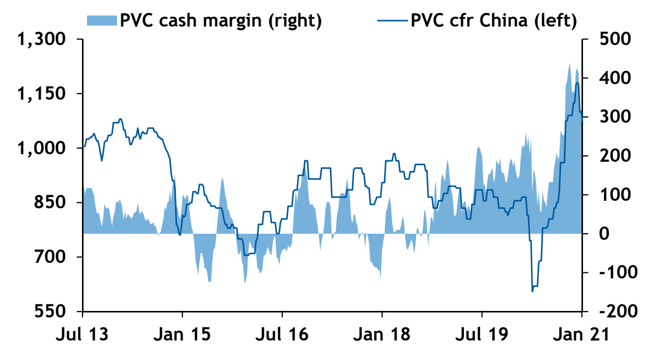
NEA SM non integrated cash margin *$/t*



Asia non-integrated PVC cash margin *$/t*



week. This was sold at $945/t cfr China. February discussions rose further to $945-960/t cfr China and March discussions settled higher at $950-960/t cfr China.

Although offers were scarce, the Asian market switched to a contango structure in anticipation of more new supplies emerging in China this year. Tangshan Risun started up its 300,000 t/yr plant in Hebei late last year. It is currently operating at about 60pc. Anhui Jiaxi's 350,000 t/yr plant is expected to start up in the coming week. Sinochem Quanzhou's 450,000 t/yr and CNOOC Shell's 700,000 t/yr plants, both located in south China, are expected to come on stream within this quarter. This means China will have 1.8mn t/yr of new supplies within the first half of the year.

Chinese inventories increased to more than 112,000t a week ago, the highest balance since November, but stock levels fell again this week to around 106,000t even though consumer operating rates rose only slightly. Demand is not expected to rise until after the mid-February lunar new year holiday. Downstream facilities in China, especially expandable polystyrene plants, tend to reduce operating rates or halt production during the extended lunar new year break.

Polyvinyl chloride (PVC)

The Chinese polyvinyl chloride (PVC) market remained weak amid lacklustre demand. Converters have shown little buying interest as domestic inventories continue to pile up. Current inventories have already exceeded last year's level but are still lower than 2017-19 levels.

The downtrend in ethylene-based PVC prices decelerated this week. Domestic cargoes traded at Yn7,500-8,050/t ex-works, a decline of just Yn50/t from the high end of the previous level. Some downstream factories in east China ramped up operations slightly with the easing of power supply restrictions, although most of them plan to maintain low operating rates ahead of the lunar new year holiday.

The import market stayed quiet as overseas prices remained higher than those in China's domestic market. Taiwan's Formosa raised its nomination price for February-delivery cargoes to $1,190/t cfr China, $1,140/t fob Taiwan and $1,320/t cif India, a $30/t rise from January. But the prices were deemed too high by Chinese importers.

Carbide-based PVC prices fell to Yn7,000-7,400/t ex-works, a Yn100-200/t decline from the previous week. Most buyers held back from covering requirements through spot purchases because of bearish sentiment in the market. Some export offers held at around $1,000-1,050/t fob China. India's import requirements have waned because of softening demand in the country.

Domestic production remains high, with few major turnarounds in January. Yangmei Hengtong's 300,000 t/yr plant is off line for maintenance from 1-15 January. And maintenance at Jiangsu Huasu's 130,000 t/yr unit has been extended by around two weeks to 13 January because of extreme cold weather.

India's PVC pipe prices remained at $1,430-1,450/t cfr India this week. A major Taiwanese producer offered cargoes at $1,320/t cif, with deals done and the offered volumes sold out within the same day. South Korea-origin cargoes were offered at $1,440-1,470/t cif across different grades. Container shortage issues are continuing to plague markets, leading to a stark

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difference in prices of cargoes from different countries and regions.

The tightness in pipe supply remains, making it difficult for buyers to secure enough stocks. A South Africa-based producer has declared force majeure on its PVC production because of a machinery breakdown, adding to such declarations in Europe and the US. If the problem persists for more than 30 days, the producer will cancel all outstanding confirmed orders. Indian buyers have been watching the global supply situation closely, with the force majeure declarations in Europe and the US significantly impacting imports to India.

Indian producers are operating at almost full capacity because of limited supplies amid firm demand. An uptick in activity in the construction and agriculture sectors has driven up demand for PVC pipe. The outlook remains murky for 2021. Some participants see possible market corrections given the increase in prices of late, but others feel the peak has yet to be reached because of continued firm demand and shipping issues.

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