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Argus *Ethylene and Derivatives*

Formerly Argus DeWitt Ethylene

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HIGHLIGHTS

Americas

- Propane crack at parity to ethane
- PE prices maintain upward momentum
- All eyes on Asian prices, demand

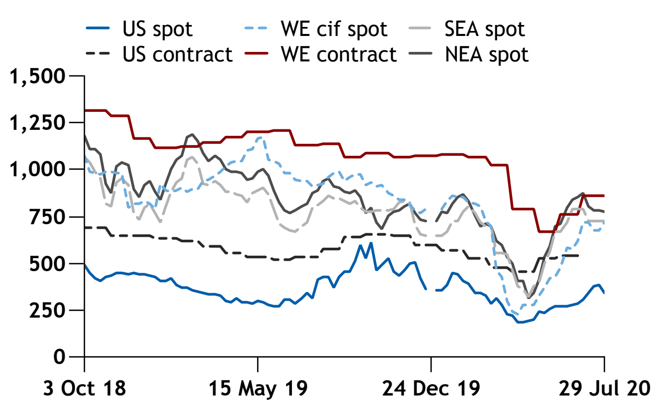
Europe

- Cracker margins under pressure
- PVC and PE demand stable at reasonable levels
- Feedstock costs up but market on the long side of balanced
- EU proposes €0.80/kg non-recycled plastic waste levy

Asia-Pacific

- Propane remained a more favourable crack than naphtha
- Ethylene prices were stable as buyers and sellers remained in a standoff
- PE supplies rose, with more cargoes arriving from the US
- EO prices fell, reacting to losses in ethylene

World ethylene prices $/t



MARKET SNAPSHOTS

Ethylene global prices				$/t
	Timing	Low	High	Mid
US				
Contract net transaction price	Jun			540
Pipeline del USGC spot		341.7	347.2	344.6
Month to date average spot prompt	Jul			356.3
Month to date average spot				350.5
Western Europe				
Contract MCP	Jul			859
NWE pipeline spot, del		717.9	735.5	726.7
Med spot, cif		700.0	735.0	717.5
NWE spot, cif		700.0	735.0	717.5
Asia-Pacific				
Taiwan contract	Jun			673
Southeast Asia spot, cfr		700.0	750.0	725.0
Northeast Asia spot, cfr		750.0	800.0	775.0
Northeast Asia spot, fob		730.0	790.0	760.0

Polyethylene global prices				$/t
	Timing	Low	High	Mid
US, del EOR, 23 Jul				
LDPE liner film HC	Jul			1,202
LLDPE butene-1 film HC	Jul			1,014
HDPE blow mold HC del	Jul			1,080
Western Europe, del NWE, 23 Jul				
LDPE liner film	Jul			1,370
LLDPE butene-1 film	Jul			1,240
HDPE blow mold HIC	Jul			1,199
Asia-Pacific, cfr CMP, 23 Jul				
LDPE liner film spot		960	990	975
LLDPE butene-1 film spot		830	850	840
HDPE film spot		910	950	930

Related feedstocks				
	Delivery	Low	High	Mid
Ethane Mt Belvieu non-LST *¢USG*	Jul	21.38	22.12	21.75
Propane Mt Belvieu non-LST *¢USG*	Jul	50.38	51.75	51.06
Propane ARA large cargo *$/t*		292.00	298.00	295.00
Propane Argus Far East Index™ *$/t*				360.00
Propane S China refrig cfr *$/t*	2H Aug	358.00	362.00	360.00
Butane Mt Belvieu non-LST *¢USG*	Jul	53.38	57.62	55.50
Naphtha full-range cif USGC *¢USG*		94.52	97.52	96.02
Naphtha 65 para NWE cif *$/t*		384.25	385.25	384.75
Naphtha Japan c+f *$/t*		397.50	403.75	400.63

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US/Canada

Spot ethylene for prompt-month delivery to Mont Belvieu, Texas, was flat last week for the Nova well, or down by about 2¢/lb for Mont Belvieu, to a range of 15.5-15.75¢/lb. The difference from last week is that the Enterprise location that had been trading at between 18.5-19.5¢/lb because of limited logistical capabilities did not trade this week. Choctaw was marked at 3.625¢/lb discount on Tuesday, similar to the levels of recent weeks. The forward curve is slightly backward through 2020.

The Port Arthur, Texas, cracker with compressor problems is expected to get back on line in the in the next two-three weeks. The planned Chocolate Bayou, Texas, cracker turnaround should be finishing soon, and the Point Comfort, Texas, cracker turnaround is expected to wrap up in late August. The importance of the Port Arthur cracker's enabling logistics is still felt by the market and is contributing to the large differentials between locations.

Expectations remain that ethylene spot prices and those of many derivatives are near peak levels, and that demand and prices are vulnerable to drops in Asia-Pacific prices and demand in the coming months. US advantaged costs have slightly increased their advantage so the US should not lose significant derivative demand until or unless derivative margins fall substantially. US ethylene is more vulnerable because of high freight rates on ethylene compared with derivative transportation costs.

Crude prices increased by 2pc over the past couple of weeks. Propane and butane rose by 7pc and 9pc, respectively, while light naphtha climbed by 2pc. Enterprise propane closed on Tuesday at 52.3pc of WTI. Ethane dropped by 5pc over the past two weeks while natural gas rose by 4pc, trimming ethane at Tuesday's close to a 10.1¢/USG premium, down from 11.7¢/USG two weeks ago.

Butane's advantaged crack expanded its advantage to 2-3¢/lb this week for the few crackers that can crack it, and a 24pc increase in propylene prices has driven propane into economics similar to ethane. Light naphtha remains about twice as expensive as the other cracks.

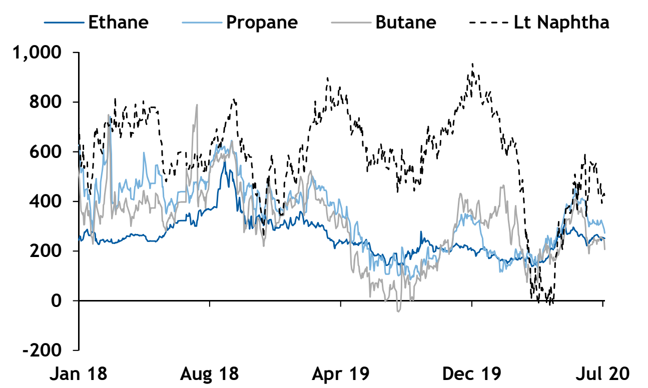
The US-northeast Asia spot spread increased by $28/t to $430/t over the past two weeks. The US-southeast Asia spread expanded by $33/t to $381/t. The northwest European spread rose by $78/t to $373/t. US terminals are booking for August, but the narrowing arbitrage is a significant headwind to additional bookings. September bookings remain a large question market subject to Asia-Pacific market developments.

Demand remains strong for most derivatives. Ethylene dichloride demand is an exception, and has weakened, as a producer is down for maintenance in Texas, and two other producers are at reduced rates because of caustic soda length. In EO/EG, prices and demand are strong and plants are running hard with margins healthy. In ethylbenzene/styrene, all plants are running and operating rates are healthy, though still not at full rates.

Polyethylene (PE) production remains constrained in July

US prices				¢/lb
	Timing	Low	High	Mid
Ethylene				
Contract net transaction price	Jun			24.50
Contract net transaction price	May			24.00
Contract net transaction price	Apr			20.50
Pipeline del USGC spot		15.50	15.75	15.63
Month to date average spot prompt	Jul			16.16
Month to date average spot	Jul			15.90
Related assessments				
EG fiber grade contract marker, exw		26.50	27.50	27.00
EG antifreeze, USGC spot		18.50	19.50	19.00
EDC export, fob USGC		11.00	12.00	11.50
Polymers, 23 Jul				
LDPE liner film HC del EOR	Jul			54.50
LLDPE butene-1 film HC del EOR	Jul			46.00
HDPE blow mold HC del EOR	Jul			49.00
PVC pipe HC del EOR	Jul			52.00

US ethylene cash cost $/t



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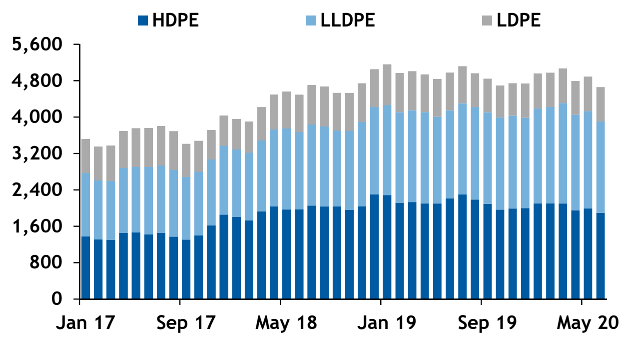
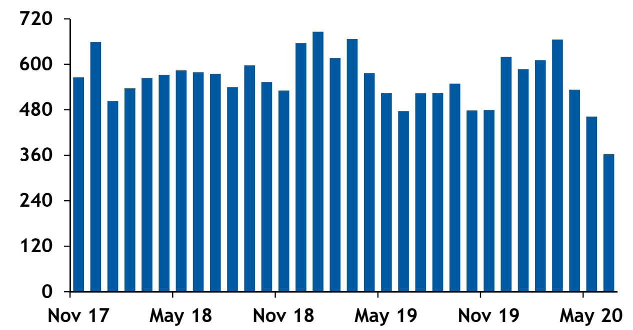
US PE inventory *mn lb*



— ACC/Vault

PVC inventory *mn lb*



— ACC/Vault

with an extended turnaround of a high-density polyethylene (HDPE) film unit in Point Comfort, as well as an ongoing force majeure in place by Nova on linear low-density polyethylene (LLDPE) production out of its Joffre, Alberta, Canada unit. No other major problems have surfaced, though some producers were believed to be controlling output to meet demand.

Availability on the secondary side has tightened for branded prime, off-grade and generic prime for all grades, with multiple producers saying they are sold out. However, while spot cargoes are not readily available, market participants said material could likely be obtained if buyers were willing to pay a premium.

Total PE production in June fell to 4.398bn lb, down by 2.17pc from May, with low-density polyethylene (LDPE) production falling by 1.2pc, LLDPE production dropping by 3pc and HDPE production down by 1.7pc over the period, according to final data from the American Chemistry Council's (ACC) Plastics Industry Producers' Statistics Group as compiled by Vault Consulting. Plants ran on average at around 91.8pc of total capacity in June.

Total PE sales in June rose by 4.2pc from May to 4.666bn lb, with exports falling by 1.2pc and domestic sales climbing by 8.1pc over the period. LDPE sales dropped by 1pc, LLDPE sales rose by 5.7pc and HDPE sales were 4.4pc higher. With sales exceeding output, producers drew down inventories by 231mn lb in June.

Sales in July have remained strong, reportedly at similar levels to June. Food packaging and film demand are still the strongest and are compensating for slowness in durables and institutional markets.

The strong demand and limited availability appears to be supporting producers' efforts to raise prices by 5¢/lb in July, which would bring prices up by 9¢/lb over two months. So far, no producer has backed off of the proposal, and buyers say it is likely the increase will be implemented. Most producers have also announced additional increases of 5¢/lb for August. Market participants see less likelihood of that increase getting implemented.

Export prices, which have inched higher all month, have begun to stabilize as global buyers have turned cautious.

US polyvinyl chloride (PVC) production in July remain constrained with at least one Louisiana turnaround ongoing and other upstream operational challenges affecting the market. Additional turnarounds are expected in the coming months.

June PVC production rose by 10pc from May to 1.323bn lb, and 7.9pc higher than in June 2019, according to the ACC. Plants operated at 90.5pc of capacity last month. Year-to-date production fell by 7pc from the same period in 2019.

June PVC sales jumped by 11.7pc from May to 1.422bn lb, with exports down by 2.6pc and domestic sales jumping by a whopping 20.5pc from May. The percentage of sales to exports fell to 34pc in June, down from 38pc in May. Year-to-date PVC sales declined by 5.8pc from the same period. Of those year-to-date sales, those into rigid pipe and tubing – the largest end use for PVC -- climbed by 0.5pc from the same period in 2019. Sales into wire and cable rose by 2.1pc, film and sheet fell by 20.1pc, siding rose by 11.1pc, while windows and doors were down by 7.7pc. Sales to resellers and compounders fell by 11.1pc.

With sales topping output, producers ate into inventories

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by around 100mn lb, leaving inventory levels at 7.7 days of sales, down from 12.8 days of sales in 2019.

Sales in July remain healthy, though global demand has begun to slow due to higher prices. Construction activity is improving.

After implementing the 3¢/lb price hike for June, US producers are pressing for another 3¢/lb increase in July, and yet another 3¢/lb in August.

Export demand is declining as producers raise offers above $760/t fas Houston.

Latin America

The latest central bank forecast calls for less-severe drops in Brazil's GDP and industrial production. The bank said GDP is expected to shrink by 5.77pc and industrial production by 7.86pc, compared with contractions of 6.5pc and 9pc, respectively, predicted weeks ago. The average July R$/USD exchange rate rose by 2.2pc from June to 5.30 after reaching a monthly record of 5.64 in May.

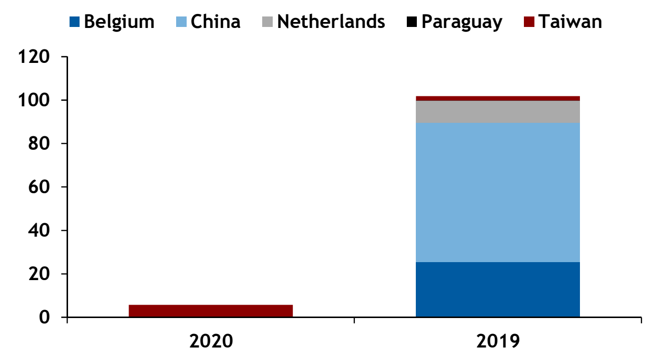
Second quarter ethylene production should not improve from the first quarter when it stood at 754,500t, the lowest in five years. The negative impact of Covid-19 on demand, especially in April and May, and the shutdown of ethylene dichloride (EDC) units in northeastern Brazil that started in May 2019 have cut into ethylene production and sales.

Brazil' domestic demand is rising, in line with the economic reopening that started in July. Ethylene plant operating rates average are above 85pc, near pre-pandemic levels, after producers kept them at 65pc in April and May. Braskem plans to shut its 200,000t/yr Triunfo ethanol-based ethylene unit, known as green ethylene, in August for a 17-day maintenance project.

The country shipped a 6,000t ethylene cargo at the end of June to Asia-Pacific, which should be included in Brazil's July trade statistics. Total first half exports in the first half were 5,700t, all to Taiwan.

Naphtha has been the preferred feedstock this year for crackers. No ethane imports have been planned since March, when a cargo arrived from the US based on the Mont Belvieu, Texas, price. Naphtha supply to Braskem's northeastern and southern crackers was negotiated in July. Braskem and Petrobras negotiated a five-year deal for Petrobras to supply 650,000t/yr to 2.5 mn t/yr of petrochemical naphtha to Braskem at prices based on European naphtha ARA, starting in

Brazil ethylene exports *'000t*



December. The naphtha to supply Sao Paulo's cracker will be negotiated later between the two companies.

Petrobras is selling 50pc of its refining capacity. The refineries to be sold are in Brazil's northeast and southeast. The sale of Rlam, in the northeast, is being negotiated by the Abu Dhabi Mubadala investment fund, which won the exclusive right to discuss purchase terms with Petrobras. Binding proposals for Repar, in the south, should be received in August.

First quarter Brazilian polyethylene (PE) output was 639,500t, roughly in line with the first quarter of 2019. But domestic sales of 451,000t were 3pc lower than in the same quarter of 2019 and exports fell by 15pc, reflecting global PE oversupply.

Except for food packaging, hygiene, cleaning and materials for hospitals, domestic PE demand dropped in most sectors during the second quarter, mostly in April and May. The automotive industry shut down in April and production fell by 50.5pc in the first half of 2020 compared with the same period of 2019. Production resumed in mid-May at reduced capacity.

Domestic PE prices rose in July by R$300/t ($57/t) for high-density polyethylene (HDPE) injection and blow molding, R$600/t ($113/t) for HDPE film, and R$400/t ($76) for low-density polyethylene (LDPE) and linear low-density polyethylene (LLDPE). Import-parity prices in June rose by $56/t to $1,346/t from May for LLDPE and by $25/t for LDPE to $1,399/t but fell by $73/t to $1,089/t for HDPE.

Brazil exported 87,600t of PE in June, with most going to China, and Argentina at $637/t fob and $835/t fob, respectively. Imports in June totaled 48,100t, mostly from the US at $857/t fob. Brazil's net PE trade is changing as the country gradually again becomes a net exporter. Total Brazilian

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exports in the first half, at 383,100t, exceeded imports of 353,800t by 29,300t or $10.6mn.

Brazil produced 179,100t of polyvinyl chloride (PVC) in the first quarter, 3.3pc less than in the same quarter of 2019, mirroring a 13pc domestic sales drop to 157,200t. Imports grew by 20pc to 98,500t, while exports quadrupled to 21,900t. Operating rates, which were low in April to May, are rising and should get back to full capacity in July.

Braskem has postponed bringing its two soda-chlorine units in Maceio back online until November, instead of in October. Salt will be imported from Chile and will be blended with salt from Rio Grande do Norte, an estate in Brazil's northeast. Brazil until then will import EDC to produce PVC. The country imported 20,000t of EDC from the US in June at $340/t fob. First half imports rose to 190,000t, more than three times imports in the same six months of 2019. Production of soda-chlorine at the Braskem facility in Camaçari, Bahia, ended in April because units there are at the end of their useful life, the company said.

Imports usually fill the deficit in Brazil's PVC capacity. Total first half imports rose to 149,850t, 15pc less than the same period of 2019. Net trade favored imports by 115,300t, or by $116.4mn, over exports. The June PVC import-parity price dropped by $18/t from May to $1,269/t.

Brazil's ethylene oxide producer plans to shut for a 15-day maintenance project at one of its two Camaçari production lines starting on 3 August. The two units are running hard in July, anticipating the turnaround and in line with strong domestic demand and for exports for derivatives used in cleaning and hygiene products. Ethylene oxide derivatives, classified as commodities by Brazilian producers, increased total sales by 2pc in the first quarter compared with the first quarter of 2019, as opportunities grew to export glycols.

Demand for ethylbenzene/styrene (SM) in Brazil is strong for polystyrene (PS) disposables in demand during the pandemic. But SM demand is weak for rubber production. Brazil's tire sales fell by 58pc in June from June 2019, contributing to a 50.5pc drop in the first half compared with the same period of 2019. Sales to auto assemblers dropped by 57pc in June from June 2019 while sales for tire replacements skidded by 21pc. June styrene imports totaled 2,500t, mostly from the US at $487/t fob. First half imports climbed to 116,800t, 33pc above the same period of 2019.

EUROPE

The holiday season has started in Europe, despite constraints caused by Covid-19, and the ethylene market is quiet. Fundamentally, little has changed — cracker margins remain a constraint, and although demand and prices for co-product propylene and butadiene have increased, this is not enough to offset a weak market for incremental ethylene. Imports from the US have arrived in Europe in July, putting pressure on the low end of the spot range, but European producers have been unwilling or unable to match these prices. Those with the flexibility to do so are cracking maximum LPG and ethane.

The market remains very cautious, with no confidence in how demand will develop over the rest of 2020. There has been an uptick in the number of coronavirus cases in many European countries, increasing fears of additional measures to control its spread and about the more damaging longer-term impact on the economy. In these conditions, producers are focused on ensuring they pass on feedstock movements — as they did when oil prices fell — and controlling all aspects of the cracker balance. Each operator has different constraints, depending on their level of integration, feedstocks and exposure to the difficult butadiene market, but all are running to maintain a delicate balance and maximise meagre margins.

Monthly contract price (MCP) negotiations for August are taking place this week, with a re-run of the July scenario. Feedstock prices have not risen to the same extent, but producers will argue that despite the length in the market they will need to recover at least the €33.26/t naphtha increase between the averages for July and June. Buyers argue that spot prices being discussed, although not concluded, at MCP minus 30pc is indicative of length and a price increase amid the current economic uncertainty is not acceptable.

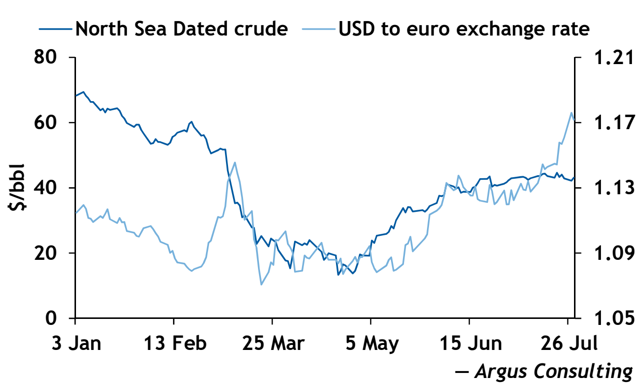
North Sea Dated crude prices have been rangebound despite a substantial weakening of the US dollar, which would normally increase oil prices. Oil prices ranged between $42.23/bl and $44.59/bl in July, while the dollar to euro rate weakened from 1.12 at the start of the month to a prompt 1.17. A weaker dollar normally stimulates the buying of commodities priced in the currency, such as oil. It is a mark of the intrinsic concerns about oil demand and the economic outlook that oil prices have stagnated while the dollar has continued to weaken. Naphtha prices have tracked oil, but strengthened relative to oil in the past few days with a positive crack spread.

Cracker margins will be the other main talking point for the August MCP. Naphtha cracking margins peaked at exceptionally

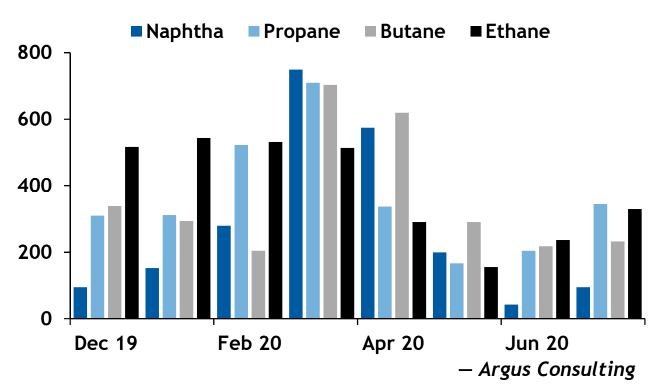
Western Europe prices

	Timing	Low	High	Mid
Ethylene				
Contract MCP €/t	Jul			764.00
Contract MCP €/t	Jun			680.00
Contract MCP €/t	May			620.00
NWE pipeline spot, del €/t		610.0	625.0	617.5
Med spot, cif $/t		700.0	735.0	717.5
NWE spot, cif $/t		700.0	735.0	717.5
Related assessments, del NWE				
EG fiber grade contract €/t	Jul			504.00
EG fiber grade contract €/t	Jun			455.00
EG fiber grade contract €/t	May			448.00
Polymers, 23 Jul				
LDPE liner film €/t	Jul			1,183.0
LLDPE butene-1 film €/t	Jul			1,070.0
HDPE blow mold HIC €/t	Jul			1,035.0
HDPE injection mold €/t	Jul			1,025.0
HDPE HMW film €/t	Jul			1,055.0
PVC pipe €/t	na			na

North Sea Dated crude vs exchange rate



Modelled cracker cash margin comparison **€/t**



EUROPE

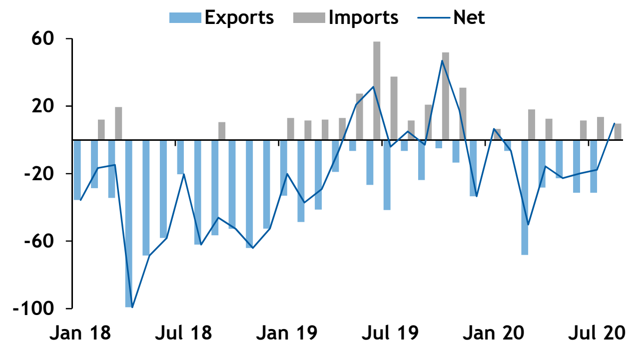
high levels in March and April — when Covid-19 lockdowns were at their peak and demand reduced — but have subsequently fallen to unsustainably low levels. Producers that have the flexibility to crack alternative feedstocks are making higher margins, although these are still well below the five-year average, and integrated PE margins remain strong. Buyers will argue that producers should take the lower cost of alternative feedstocks into account in MCP negotiations, but given that more than half of European ethylene is made using naphtha feed and these tonnes need a positive margin, naphtha will remain the benchmark.

The spot market has been very quiet, as might be expected, amid limited scheduled or unscheduled cracker maintenance — just one cracker in Scandinavia is down, while another in France is constrained. Imports of 13,600t from the US loaded earlier in July put pressure on the lower end of the spot range but have not been repeated in the European arena, and US spot numbers have subsequently risen. There is another import booked for August — this cargo will benefit from an advantageous freight rate as a part cargo with ethane. A cargo being quoted out of the UAE is likely to go to Asia-Pacific. Europe continues to export product, but not at the rate seen in 2018, before the US installed new export capacity. Europe was a net importer in 2019 amid a heavy maintenance schedule.

The EU has proposed introducing an €0.80/kg levy on non-recycled plastic packaging from 1 January 2021, as part of its 2021-27 budget and post-coronavirus recovery plan. The detail of the text is ambiguous and the European Commission said in May that this was not a tax, rather "a contribution to the EU budget designed to incentivise member states to increase recycling from plastic waste". Member states are under no obligation to introduce the measure and could opt to make their contribution to the EU budget through other routes.

PE demand remains stable at a reasonably high level. Where packaging demand has eased, demand from the industrial and construction sectors has compensated. LDPE is the strongest grade in terms of demand, with LLDPE not far behind. HDPE is still the laggard, despite being better than it was in the second quarter. Imports of contract material continue to flow from the US and the Middle East, and the fact that they have remained constant reflects good consumer demand. There has been very little disruption from spot imports, so either producers are being much more careful than they were in the fourth quarter of 2019 about shedding material via distributors, or there is little appetite for the longer lead times

Estimated WE monthly "deep-sea" ethylene trade *'000t*



—Argus Consulting

and consequent price and availability risks.

PE prices are increasing, and producers have been able to pass through the full ethylene price rise for the in-demand grades. The probability that prices will increase again in August is a supporting factor. But there is more pressure on HDPE prices and buyers are gaining €10-20/t discounts against the €84/t monomer increase. Producers are cautious about the demand outlook and expect August to be seasonally weaker, but have a limited view on how weak, and how the rest of the year will evolve.

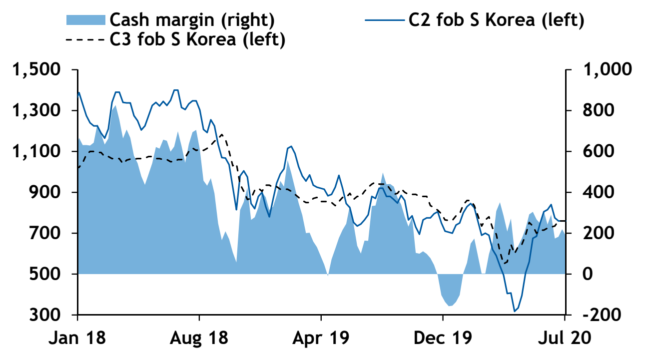
July is proving to be better than anticipated for PVC demand. Consumers are still playing catch-up from earlier lockdowns, particularly in the construction sector. But all sectors are pulling through reasonable volumes. The market balance is tighter, driven by unplanned shutdowns, good demand and length in the caustic market, which is limiting incremental production. EDC is in demand from India and Egypt, as the US is exporting less as it is also constrained by caustic soda, but even at higher prices exporting from Europe is unattractive because of the poor caustic returns.

PVC prices are rising in line with 50pc of the €84/t rise in the July ethylene contract price, and producers are considering a monomer-plus price increase for August. This would be highly unusual and a mark of the uncharacteristic business cycle in 2020, but if it happens it will need direction from the market leader.

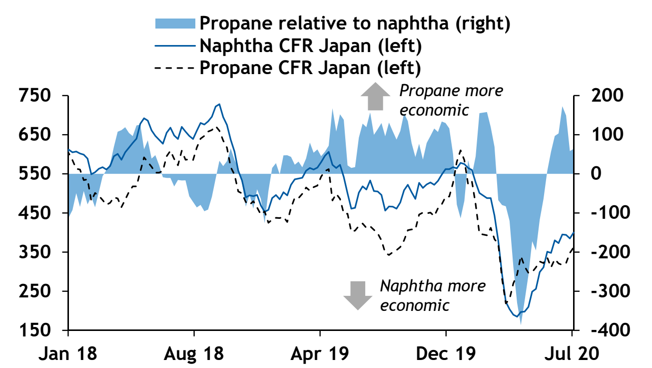
MEG margins and demand have changed very little in the past two weeks. PET demand has been reasonably strong in July as buyers stock up while they perceive prices to be relatively low. MEG imports from the US have started to increase, which will add length in August.

ASIA-PACIFIC

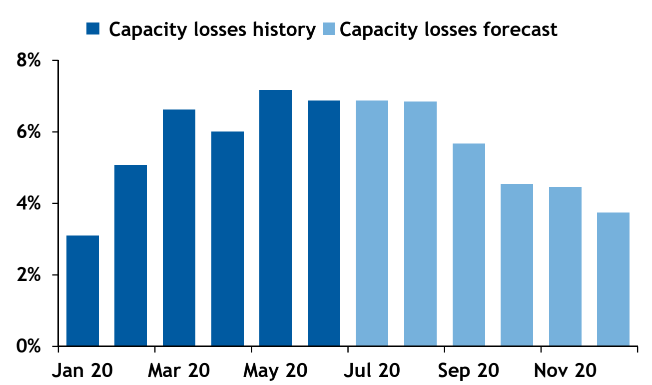
Asian cracker cash margin spot $/t



Asia cracker feedstock economics $/t



Asia ethylene capacity loss, 6 months rolling %



Asia-Pacific prices				$/t
	Timing	Low	High	Mid
Ethylene				
Taiwan contract	Jun			673
Taiwan contract	May			570
Taiwan contract	Apr			423
Southeast Asia spot, cfr		700	750	725
Northeast Asia spot, cfr		750	800	775
Northeast Asia spot, fob		730	790	760
Related assessments, cfr				
MEG contract	Aug	560	590	575
MEG contract	Jul	560	590	575
MEG contract	Jun	540	570	555
VCM NE Asia spot		650	660	655
EDC NE Asia spot		240	250	245
**preliminary*				
Polymer assessments, cfr, 23 Jul				
LDPE liner film, CMP		960	990	975
LLDPE butene-1 film, CMP		830	850	840
HDPE injection mold, CMP		840	860	850
HDPE film, CMP		910	950	930
PVC pipe, SEA/China		800	810	805

Outages			
Shutdown	Plant	*KTA*	Duration
Lotte Daesan	Cracker	1 mil	4Mar, restart in 4Q
JXTG Kawasaki	Cracker	460	endFeb-endJun
Petronas Rapid	Cracker	1mn	March. Likely in 4Q
BASF-YPC	Cracker	740	30Apr-endJun
Sinopec SK Wuhan	Cracker	800	delayed to Oct, 70 days
ExxonMobil No2	Cracker	1,000	delayed to Sept, 1 month
Sinopec Maoming	Cracker	320	delayed, 71 days
SABIC Tianjin	Cracker	1m to 1.3m	9May, 10 July
Sinopec Tianjin	Cracker	200	9May, 10 July
Maruzen Chiba	Cracker	525	12May-13Jul
Mitsubishi Kashima	Cracker	542	12May-endJul
S Oil	FCC	200	endMay, 2 mths
Mitsui Osaka	Cracker	600	11Jun to 19 Jul
Jiangsu Sailboat	MTO	360	17 July, 20-30 days
Idemitsu Tokuyama	Cracker	623	Sept, 45 days
CPC No.2	Cracker	385	2-6 July
Formosa No.3	Cracker	1,200	midAug, 40 days
YNCC No2	Cracker	580 to 880	end Oct, 40 days
Hanwha Total	Cracker	1.42m to 1.57m	Nov-Dec
Map Ta Phut Olefins	Cracker	900	Nov-Dec 45 days
Sinopec Yanshan	Cracker	820	Delayed. 45 days.

Upstream and cracker margins

Naphtha prices rose to $400/t this week, up by $15/t. Propane prices also edged higher to $362/t, up by $14/t from last week. Feedstock propane continued to fetch higher cash margins for producers compared with naphtha. Propane cash margins were at $251/t, down by $27/t. Naphtha cash margins were at $187/t, down by $33/t.

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Ethylene

Deals and discussions:

- $790-800/t cfr northeast Asia, September arrival, deal done
- $800-850/t cfr northeast Asia, August arrival, selling indications
- $700-750/t cfr northeast Asia, August arrival, buying indications
- Premium of $20-30/t on cfr northeast Asia prices, deals on floating basis

Ethylene prices in northeast Asia are mostly unchanged this week as most buyers and sellers remain in a standoff that has persisted through the past few weeks. Demand continues to be mostly stable-to-weak across key downstream sectors, while supply conditions are still seen as balanced for the rest of this quarter.

One deal for a September-arrival cargo from Europe was concluded at $790-800/t cfr northeast Asia this week. Sellers were mostly firm about keeping offers above $800/t through most of this week. But by the week's close, a key trader reduced offers for August-September arrival to $800/t. Meanwhile, buying indications from consumers failed to firm as margins remained under pressure. Most of these indications were in a $700-750/t range and were from consumers in sectors like styrene monomer (SM).

On a floating basis, several deals were concluded at a premium of $20-30/t on the average of cfr northeast Asia prices. No further details were available this week. On a fob northeast Asia basis, not many discussions could be located. But producers continued to seek prices close to cfr northeast Asia levels, citing tight supply conditions in parts of the region.

In South Korea, ethylene spot volumes for export continue to be limited on the back of an ongoing outage at Lotte's 1mn t/yr cracker in Daesan. The cracker was taken off line in March because of an accident and is due to resume production from November. This has resulted in an estimated 20,000t of ethylene being taken from spot export volumes to be diverted for downstream consumption by the producer. There was additional supply tightness this week because of a slight dip in South Korean producer LG Chem's cracker rates in Daesan as well. The cracker's production rates were cut to 92-93pc because of compressor-related problems. LG Chem's other cracker in Yeosu continues to operate at 100pc.

In China, supply is also seen to be balanced compared with demand, although production has resumed at crackers that were shut for maintenance in May-June. A key producer is set to shut its mixed-feed cracker from 20 August for planned maintenance that is due to last about 40 days.

Production at Taiwanese crackers remains high, with CPC ramping up operating rates at its 700,000 t/yr Linyuan-based cracker following a brief shutdown earlier this month. Formosa is also maintaining full rates at all its three Mailiao-based crackers, with plans to shut the 1.2mn t/yr No.3 cracker from mid-August for nearly two months of maintenance.

In September, Japanese cracker operator Idemitsu is also planning a turnaround at its Tokuyama-based 623,000 t/yr plant for 45 days.

Hence, the supply balance in northeast Asia is currently balanced, with expectations of pockets of tightness because of the planned shutdowns and reduced deep-sea arrivals in August-September. An estimated volume of 60,000t has been fixed for loading from the US in August as of now, which is 10,000-20,000t less than volumes fixed in June-July. The recent upswing in US prices and possible production issues have added to an anticipation of fewer arrivals in Asia-Pacific later this quarter.

But operating rates at most of the crackers in northeast Asia are expected to remain at near full rates, bolstered by positive margins. Naphtha prices at $390.25/t cfr Japan on Wednesday kept the spread with ethylene at $384.75/t.

Discussions were scattered in southeast Asia, with no deals concluded this week. Prices were stable at $700-750/t cfr southeast Asia.

There could be some buying interest from Thailand as producers received a few enquiries, but no offers were made as most producers had no spot supplies.

ExxonMobil may be delaying its turnaround again to Sep-

Downstream outages

Shutdown	Plant	*KTA*	Duration
Nippon Steel, Oita Japan	SM	190	Feb- April, 2 mths
Nippon Steel, Oita Japan	SM	230	Feb-April, 2 mths
TSMC, Taiwan	SM	160	20 Feb-mid March , 3 weeks
TSMC, Taiwan	SM	180	end Feb to 10 March, 3 weeks
Tianjin Dagu, China	SM	450	Q2, 1 mth
Taiyo Oil, Japan	SM	370	mid-Aug -mid Sep, 45 days
GPPC, Taiwan	SM	240	March-April, 30 days
Formosa 1+2, Taiwan	SM	600	Q2, 1 mth
Idemitsu Kosan, Tokuyama	SM	120	Sep, 1 mth

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tember, although no further details can be confirmed for now. The producer has been postponing a one-month turnaround at its No.2 1mn t/yr cracker since April because of a lack of manpower in Singapore amid the Covid-19 outbreak.

Polyethylene (PE)

Chinese domestic polyethylene (PE) prices increased this week in line with higher linear low-density polyethylene (LLDPE) futures and lower inventories, while a slowdown in demand for imported cargoes narrowed the price gap with domestic prices. The impact of a delay in the arrival of Iranian cargoes on PE supplies in China has been erased on the back of other supply arrivals.

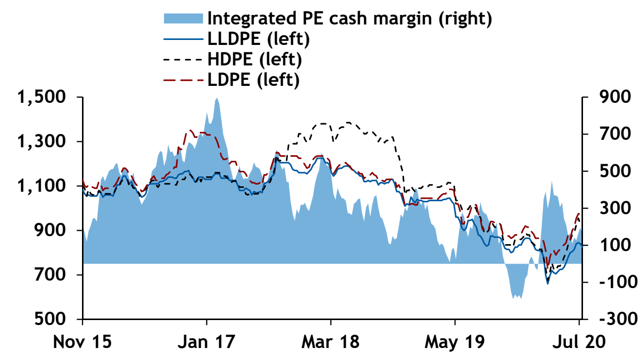
The issues surrounding customs clearance of Iranian cargoes have not been solved, with vessels owned by the Islamic Republic of Iran Shipping Lines (IRISL) still unable to dock at major Chinese ports such as Shanghai and Qingdao. There was no progress on the exact date of arrivals. Some of these ships may be diverted to southeast Asia for transfer and a return passage to China. Several large Chinese trading companies have been forced to declare force majeure on supplies as a result of the delays.

But the impact has been limited as the sanctions apply only to IRISL-linked vessels, with other Iranian PE cargoes allowed to arrive as usual, albeit in small volumes. A rise in US supplies to China has helped fill the shortfall in Iranian imports this month. The Chinese government has allowed importers to apply for exemptions on additional tariffs on US-origin HDPE and LLDPE since 2 March. Exemptions have been granted for around 200,000t of PE from the US, which is due to arrive between the end of June and August, thus easing supply tightness.

The Chinese domestic market strengthened in line with rising LLDPE futures. Inventories of PE and PP at China's Sinopec and PetroChina continued to drop to 645,000t from 715,000t, which were at lower levels compared with last year. Major producers firmly held ex-work offers higher. LLDPE prices firmed by 50-150 yuan/t during the week to Yn7,150-7,250/t. LDPE prices increased by Yn100/t from the lower end to Yn8,400-8,800/t. HDPE film prices were up by Yn150/t from the lower end to Yn7,950-8,300/t in east China.

Demand for imported material slowed this week, with other Iranian vessels not linked to IRISL arriving. US-origin supplies also arrived and dragged down prices. Indian-origin

Asia integrated PE cash margin *$/t*



LLDPE was offered at $810-820/t for September shipment. The workable level for LLDPE fell to $810-840/t. Saudi HDPE film was offered at $950/t. But deals were only at $930/t. HDPE film fell to $910-940/t. Workable prices for LDPE remained unchanged at $960-990/t.

China is entering its low season for PE demand, with downstream orders slowing from July. Current flooding and hot weather in east and south China have also limited PE demand.

Supplies are increasing, with some plants returning from maintenance. Ningxia Baofeng's 300,000 t/yr HDPE/LLDPE unit has been down since 3 July and may restart this week. Yanchang China Coal's shutdown of its 600,000 t/yr unit will last for 50 days. China Coal has shut its 300,000 t/yr LLDPE unit for a month from 30 June.

Ethylene glycol (MEG)

Asia-Pacific MEG prices were stable through this past assessment week, although average prices were $15-20/t higher from mid-July.

Market sentiment rose following production cuts at several Asia-Pacific MEG plants, improving supply fundamentals and pushing up discussion levels.

Offers were at $435-440/t cfr China from last Wednesday to Friday, and some deals were concluded at $430-435/t cfr China. Several trading firms expect the demand-supply balance to change in August because of the production cuts. Nanya's lower MEG exports and an unscheduled shutdown at OUCC's Yangzhou plant will also further tighten MEG supplies in coming month.

Lower port inventories further supported MEG prices from Monday to Tuesday. Offers were made at $440/t cfr China

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earlier this week. A handful of deals were concluded at around $435/t cfr China in the latest two trading sessions. Most of the buyers were trading firms, rather than consumers.

China's domestic MEG market was active from last Wednesday to Friday, supported by a rebound in MEG futures and a pick-up in downstream PET fiber sales activity. Discussion levels for prompt shipments moved up from 3,550 yuan/t to Yn3,620/t ex-tank, with many deals concluded among trading firms. Consumers also booked volumes to fulfill their production demand for August.

Sentiment cooled slightly in the latter two trading sessions on Monday and Tuesday. Slow PET bottle chip and fiber sales dampened market sentiment and capped negotiation levels at below Yn3,660/t ex-tank, even though sellers tried to support the market by increasing offer prices to Yn3,680-3,700/t. Transactions were not as active as the earlier half of the assessment week. But August shipments' premium to prompt shipments increased to Yn45-50/t because of shrinking supply. Deals were done at Yn3,700-3,720/t.

Flooding along the Yangtze river has affected MEG discharging in recent weeks, causing MEG inventories at east China main ports to fall by 30,000t to 1.48mnt this week.

On the production front, OUCC Yangzhou shut its 500,000 t/yr unit last Thursday because of a mechanical issue. The maintenance may take 15-20 days, longer than the initially planned seven to eight days, as the issue seems more serious than expected. Meanwhile, supplies from the syngas-based MEG producers remained low, with operating rates staying at around 40-45pc in July.

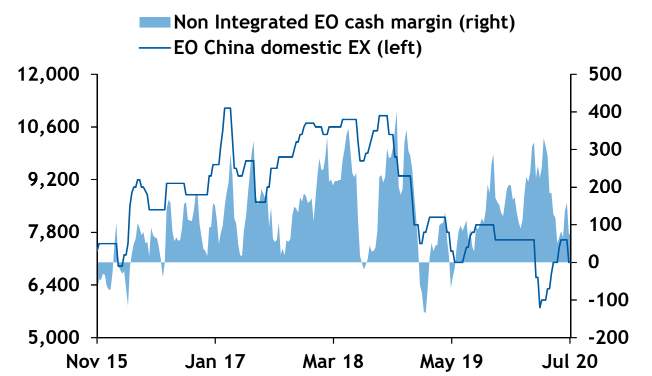
Demand remains steady. But August demand may decline marginally because Chinese polyester manufacturers are struggling with rising product inventories. Some producers are considering lowering their output if sales still do not increase before the end of this month.

Ethylene oxide (EO)

Domestic prices for ethylene oxide (EO) in east China dropped by Yn600/t to Yn7,000t/yr this week, reflecting the recent losses in ethylene and low downstream supplies because of floods.

The downstream water-reducing agent sector has been affected by the flooding in south China, limiting demand for EO. Water-reducing agents are typically used in the construction industry, and flooding in the country, especially in south China, has slowed construction activity. Market participants expect EO prices to soften further as the outlook for EO is bleak because of uncertainty over weather conditions in China.

China EO non-integrated cash margin *$/t*



The supply shortage eased after Sabic Tianjin's 120,000 t/yr and Sinopec Tianjin's 40,000 t/yr EO units came on line in early July. But several unexpected shutdowns could lead to a shortage of EO in the market. Jiangsu Sailboat shut its 180,000 t/yr EO unit on 17 July because of a technical problem. The plant is expected to return on line by early August. OUCC's 150,000 t/yr EO plant in Yangzhou went off line on 22 July after facing some hiccups and would need at least 10-15 days before it can restart.

Styrene monomer (SM)

Overall styrene monomer (SM) operating rates remained high in China, rising modestly a week ago after Zhejiang Petrochemical (ZPC) increased operating rates back to about 90pc. ZPC reduced SM operating rates to 70-80pc in June because of a lack of ethylene.

Production losses at standalone SM producers have halved from about $90/t in June to about $45/t a week ago. SM producers were seeing losses because of expensive ethylene, which soared to as high as $900/t cfr northeast Asia four weeks ago. With the losses shaved off, most SM producers in China are opting to run their plants in anticipation of a further easing in ethylene prices.

Chinese SM producers are also keeping operating rates high despite production losses to maintain their market share, as China will be adding at least another 5mn t/yr of SM capacity by 2025. As it is this year, the start-up of and smooth opera-

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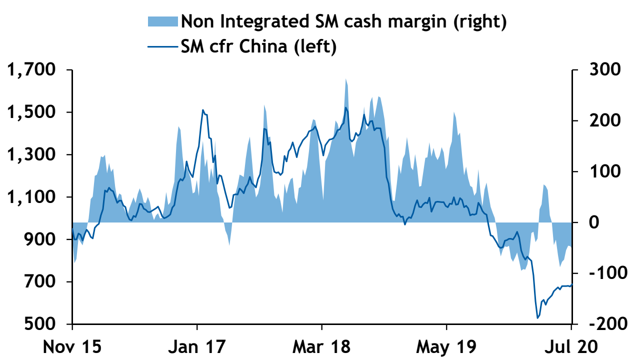
NEA SM non integrated cash margin $/t



tions at both ZPC and Hengli Petrochemical have brought almost 2mn t/yr of new SM supplies into the market. Another 350,000 t/yr will soon be coming on stream as Bora LyondellBasell is preparing to start up its unit. This new entrant's upstream naphtha cracker is currently undergoing trial runs.

Market participants initially expected the start-up of new projects to see some delays because of the Covid-19 pandemic. They also expected Bora LyondellBasell and Sinochem Quanzhou to start up their SM plants later this year and CNOOC Shell to push the start-up of its plant to early 2021 from this year. But it seems like the pandemic may not derail some producers' plans, although others are likely to still face delays.

The SM market in China remains rangebound for a second month. Prices have remained at around $685-690/t cfr China for August arrival and at $690-695/t cfr China for September arrival amid a lack of market discussions. China's domestic prices have largely held at 5,400-5,500 yuan/t, or about $675-680/t on an import parity basis, which are below cfr China prices.

The ongoing stalemate is because of the oversupply, which is causing inventories to remain high despite high demand. Inventories in east China have breached a high of more than 300,000t since March. This briefly fell to 280,000t in April but a surge in imports took the balance back to above 320,000t in June. Demand for subsequent imports is expected to be subdued because high domestic production will ensure Chinese inventories remain elevated throughout most of this year.

Polyvinyl chloride (PVC)

Polyvinyl chloride (PVC) prices in Asia-Pacific were steady this week. Taiwan-origin cargoes for August delivery are sold out in the Asia-Pacific region. Indian demand continues to be strong and is supporting current prices. The Chinese market was unchanged, with balanced supplies and demand.

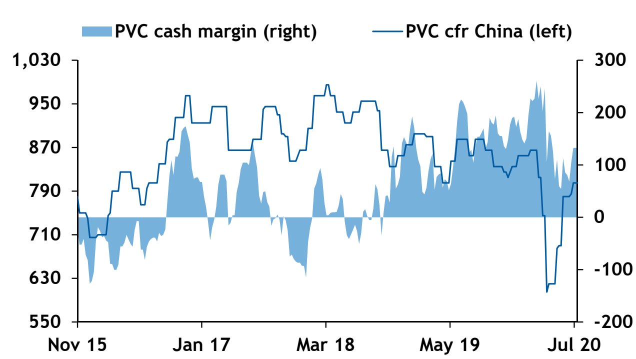
The import market in China was stable following higher offers from Formosa, which were at $810/t cif China. Formosa is planning to cut its exports in August because of maintenance plans, and the explosion at Begliau refinery has also reduced PVC export volumes. Although Chinese buyers maintained their resistance to the rise in prices, most cargoes to China were still sold at this level based on the reduced volumes. Mainstream prices in China remained at $810-820/t cif.

China's domestic PVC prices weakened slightly on seasonal demand. The construction industry has slowed because of high temperatures and recent flooding in China. But PVC futures still supported the physical market, preventing a big slump. Ethylene-based PVC prices fell to 6,800 yuan/t, with the higher-end level at Yn7,000/t. Carbide-based PVC prices eased to Yn6,450-6,550/t ex-works. The gap between ethylene-based and carbide-based prices remained unchanged at Yn400/t.

Chinese-origin export volumes remained at lower levels compared with the same period last year. China's prices are less competitive compared with Taiwanese and South Korean cargoes. Chinese producers prefer to sell supplies to the domestic market.

PVC operating rates at China's domestic producers contin-

Asia non-integrated PVC cash margin $/t



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ued to increase to 79pc, with less turnarounds. Most plants restarted in July. Only Xinjiang Zhongtai, Inner Mongolia Junzheng, Wuhai Chemical and Shaanxi Beiyuan plants have turnaround plans in August.

Southeast Asian PVC was trading at $810-820/t cif after Formosa raised its August offers. PVC demand in southeast Asia is slowing in line with the seasonal norm.

In India, the Covid-19 outbreak has been affecting markets. India has more than 1.5mn coronavirus cases. Construction activity has been significantly reduced as lockdowns have led to labour issues. Business at manufacturers of PVC flooring, wallpapers and wiring is also affected because of this.

Agricultural use of PVC for pipes continues to remain strong. Agricultural activity is still ongoing, with no significant impact from monsoon rains. Prices remained at $860-880/t cfr India. The supply tightness continues, with fewer imports from the Americas and Europe because of the pandemic. Domestic factories are running at 80-90pc capacity.

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Registered office
Lacon House, 84 Theobald's Road, London, WC1X 8NL
Tel: +44 20 7780 4200

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Publisher
Adrian Binks

CEO Americas
Euan Craik

Chief operating officer
Matthew Burkley

Global compliance officer
Jeffrey Amos

Commercial manager
Christina Wimmer

Global SVP editorial
Neil Fleming

Editor in chief
Jim Washer

Managing editor, Americas
Jim Kennett
Contact: Jimmy Levine
Tel: +1 713 400 7857
ethylene@argusmedia.com
Customer support and sales
support@argusmedia.com
sales@argusmedia.com

Houston, US
Tel: +1 713 968 0000
New York, US
Tel: +1 646 376 6130
Washington DC, US
Tel: + 1 202 775 0240
London, UK Tel: +44 20 7780 4200
Astana, Kazakhstan Tel: +7 7172 72 92 94
Beijing Tel: +86 10 6598 2000
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Moscow, Russia Tel: +7 495 933 7571
Sao Paulo, Brazil
Tel: +55 11 3235 2700
Singapore Tel: +65 6496 9966
Tokyo, Japan Tel: +81 3 3561 1805