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Argus *Propylene and Derivatives*

Formerly Argus DeWitt Propylene

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HIGHLIGHTS

Americas

- US spot PGP price rises to highest levels in 10-months on supply issues
- Invista PDH struggles to restart from its late-November turnaround
- US February contract settles at its highest level since June 2022

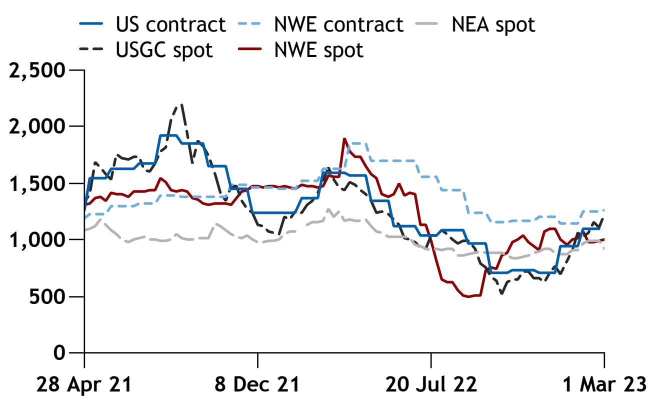
Europe

- Market remains long
- Spot prices at wide discount to MCP
- Refineries running at good rates

Asia-Pacific

- Resistance from buyers given eroding margins dragged propylene prices
- Losses in propane prices led to restart of PDH units, adding more supplies
- Increases in cracker operating rates will see more propylene output

World PG propylene prices $/t



MARKET SNAPSHOTS

Global prices				$/t
	Timing	Low	High	Mid
US				
Poly grade USGC contract	Feb			1,102
Poly grade USGC contract	Jan			948
Poly grade USGC contract	Dec			705
Chemical grade USGC contract	Feb			1,069
Chemical grade USGC contract	Jan			915
Chemical grade USGC contract	Dec			672
Poly grade USGC pipeline spot		1,108	1,334	1,221
Refinery grade Mt Belvieu spot		391	507	449
C3 alkylation USGC calc value		1,490	1,499	1,495
PP Homo GP IM del EOR 24 Feb	Feb			1,455
Western Europe				
Poly grade NWE contract	Mar			1,257
Poly grade NWE cif spot		950	1,046	998
Chem grade NWE cif spot		790	843	816
PP Homo GP IM NWE del 24 Feb*	Feb			1,535
Asia-Pacific				
Poly grade Taiwan contract	Jan			915
Poly grade Taiwan contract	Dec			910
Poly grade Taiwan contract	Nov			905
Poly grade SE Asia cfr spot		1,010	1,050	1,030
Poly grade SE Asia fob spot		960	1,000	980
Poly grade NE Asia cfr spot		910	940	925
Poly grade NE Asia fob spot		890	920	905
Raffia cfr China 24 Feb		960	980	970

**freely negotiated monthly prices*

Acrylonitrile				$/t
	Timing	Low	High	Mid
USGC fob prompt *¢/lb*		64	66	65
China cfr spot		1,530	1,600	1,565

Related feedstocks				
	Delivery	Low	High	Mid
Ethane Mt Belvieu non-LST *¢/USG*	Feb	21.13	24.25	22.69
Propane Mt Belvieu non-LST *¢/USG*	Feb	82.63	87.75	85.19
Propane ARA large cargo *$/t*		660.00	666.00	663.00
Propane Argus Far East Index *$/t*				662.50
Butane Mt Belvieu non-LST *¢/USG*	Feb	118.50	141.00	129.75
Naphtha full-range cif USGC *¢/USG*		187.20	193.20	190.20
Naphtha 65 para NWE cif *$/t*		738.25	739.25	738.75
Naphtha Japan c+f *$/t*		725.00	734.50	729.75

Tables include hyperlinks to those values maintained in the Argus database.

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US/Canada

The range for prompt-month US spot polymer-grade propylene (PGP) for Mont Belvieu, Texas, delivery rose sharply this week as supply issues continue to drive the US propylene market. No outright physical trades were recorded, but bids rose to as high as 58¢/lb this reporting week as word that the 658,000 t/yr Invista propane dehydrogenation (PDH) unit in Houston, Texas, is having issues as it attempts to restart.

The US spot PGP is at its highest level since early May 2022. This morning, March PGP was bid as high as 60.625¢/lb, crossing the 60¢/lb mark for the first time since April 2022. Be it noted that this bid will be included in the pricing data for next week's report, but it indicates just how quickly prices are rising as the propylene market digests the latest news of supply woes.

Invista had attempted its first restart on 18 February, according to a company filing on the Harris County Manufacturers Association Community Awareness Emergency Response (CAER) system. The company had taken the unit down in late November for an 45-60 day turnaround that has extended to now 90 days. On 24 February, the company issued a second filing showing another attempt to restart, indicating that the first attempt had not been fully successful. Market participants heard the reason for restart troubles stemmed from the unit's PGP not being on specification. On 24 February, spot prices soared 11pc, jumping from 50.5¢/lb for February PGP to 56.25¢/lb. This sent the February premium to a steep 6¢/lb over March. This steep backwardation has shifted another month, with the March/April paper spread trading at a 6¢/lb backwardation on Tuesday.

February's monthly contract negotiations were in full swing on Friday when spot prices jumped sharply. The February contract ended with a final settlement only confirmed Monday at up 7¢/lb to 50¢/lb, its highest level since June 2022.

While no one is buying physical propylene at these prices this week, market participants have stepped into the volatility with at least a dozen financial propylene deals transacting. Just yesterday, March paper PGP traded first at 53¢/lb, then later at 54.25¢/lb, and finally at 57.5¢/lb. April paper PGP traded twice at 49¢/lb.

Pipeline refinery-grade propylene (RGP) remains scant, with the only recorded transacted volumes for February recorded at 18¢/lb in late January. Bids were last heard higher at 22.5¢/lb, which has set the price for the week. March RGP rail bids rose to as high as 27¢/lb this week, but no offers were heard. The rising spot price of PGP is nearing RGP's alkylation value, which stood at 67.8¢/lb as of yesterday. Some market participants hope that this will spur more liquidity in the RGP spot market, as refineries keep less on site. US refineries operated at 85.8pc of their operable capacity last week, according to this morning's data from the Energy Information Agency (EIA).

A few US polypropylene (PP) plant maintenance issues are still ongoing, but others have largely been resolved heading into March. However, weak demand, high propylene prices, and a large inventory build in January are likely keeping PP producers from running at full rates this month. The Pinnacle Polymers force majeure is believed to have largely ended, with plant operations heard to have normalized. Sources indicated that the Ineos Olefins & Polymers plant in La Porte, Texas, has either partially restarted or is in the process of restarting this month, though that information could not be immediately confirmed. Another US PP producer is still in the midst of a lengthy turnaround that will extend into this month.

US prices				¢/lb
	Timing	Low	High	Mid
Propylene				
Poly grade USGC export spot		52.75	63.00	57.88
Poly grade USGC pipeline spot		50.25	60.50	55.38
Refinery grade USGC spot		17.75	23.00	20.38
Refinery grade USGC spot MTD	Feb			18.00
C3 alkylation USGC calc value		67.60	68.00	67.80
C3 fuel USGC calc value		19.50	20.50	20.00
Polypropylene				
PP Homo GP IM del EOR 24 Feb				66.00
Copolymer del EOR 24 Feb				68.00
Acrylonitrile				
USGC fob prompt		64	66	65

US contract pricing		
	$/t	¢/lb
Poly grade		
Feb	1,102	50.00
Jan	948	43.00
Dec	705	32.00
Chemical grade		
Feb	1,069	48.50
Jan	915	41.50
Dec	672	30.50

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Spot availability remains limited, with producers not offering a lot of spot volume at the moment. There were some below market fixed-price offers heard coming out of Canada during the week, but it was not immediately clear how much availability there was at the low prices.

Final January data from the American Chemistry Council (ACC) showed producers added 138mn lb to inventories in January, according to data from the ACC's Plastics Industry Producers' Statistics Group as compiled by Vault Consulting.

January production rose to 1.531bn lb, up by 29pc from December levels, with plants operating at around 80pc of total capacity, according to the ACC. PP sales in January rose to 1.377bn lb, up by 6.32pc from December levels, with domestic sales up by 10.25pc and exports down by 42.55pc over the period. Total January sales are down by 3.5pc from January 2021 levels and are below average levels for the full year 2021, suggesting that sales volumes have not yet returned to more normal levels.

Demand in March continues to improve slightly from February levels, though market participants remain very concerned about the outlook for the second quarter. One buyer said future orders are weaker than at any time since 2008. As an example, the Dallas Fed reported that Texas factory activity declined in February for the first time since May 2020, according to the Texas Manufacturing Outlook Survey. The production index, a measure of state manufacturing conditions, fell from 0.2 to -2.8, a reading suggesting a modest contraction in output.

February PP contracts are heard to be largely settling higher by 7¢/lb, tracking the increase in PGP costs. Efforts by producers to achieve between 3-6¢/lb worth of margin enhancement failed, as a further increase on top of a 7¢/lb monomer-related increase was considered too much by most buyers.

US acrylonitrile (ACN) prices have risen to between $1,420-1,450/t, as propylene input costs drive prices higher. The higher prices will continue to hamper US exports and domestic production rates.

Latin America

Braskem released on 27 February its 4Q22 - Production and Sales report. In it the company said that the spreads for its chemical and petrochemical products continued to be affected by a global imbalance between its supplies and demand. Braskem pointed to China's Covid-zero restrictions, worries about the US economic recession, the geopolitical scenario in Europe and increased products availabilities with new polyethylene (PE) and polypropylene (PP) capacities in the US and China as reasons for the supply/demand imbalance.

In Brazil, the utilization rates of Braskem's ethylene crackers based on naphtha and gas fell three percentual points (p.ps.) in 2022 from 2021 to 78pc due to a 47-day planned maintenance at Triunfo's cracker and a 37-day planned polyvinyl chloride (PVC) at Alagoas, affecting Camaçari's cracker. Due to maintenance, lower feedstock availability from Rio de Janeiro and São Paulo refineries impacted the crackers' operational rates at Duque de Caxias, RJ, and ABC, SP. The utilization rates of Braskem's ethylene cracker based on ethanol (green ethylene) remained high in 2022 at 95pc, although it had fallen six p.ps. from 2021 due to maintenance at PE units throughout the year. The green ethylene margins were strong in 2022, supported by the resilient demand in the international market.

The resins sales in Brazil were 3.518mn t in 2022, increasing 1pc from 2021, thanks to higher PE demand, which partially balanced a lower PVC and PP demand. Resins exports of 827,000t were in line with those in 2021. Green PE sales of 179,000t grew by 8pc in 2022 from 2021 — a record — attributed to better logistical availability and firm demand.

Petrobras' refinery, Refap, in the south, and Refinaria de Mataripe (Acelen), in the northeast, have been in maintenance since January, reducing naphtha and propylene delivery to those Brazilian regions. The two refineries have a total propylene capacity of 336,000 t/yr. Braskem manages its naphtha inventories by increasing imports and tracking its cracker's operational rates with demand.

Indeed, Brazil imported 540,600t of naphtha in January, 51pc more than in 2022, to balance the lack of feedstock from those two refineries. Europe was the top seller with a 52pc market share priced at $710/t, surpassing North America, the usual leader, which lost 20 p.ps to 43pc at $795/t. Africa-Middle East had 5pc at $655/t, and there were no buys from South America.

There were no propylene exports from Brazil in January, and there are no plans for exporting it this year.

Polypropylene (PP) imports in January jumped 46pc from January 2022 to 38,900t, stimulated by reduced import duties since 5 August 2022 and lower Braskem's PP output due to less

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propylene availability from the south and northeast refineries. The distribution sector sold 16pc more PP in January compared with January 2021, suggesting improved domestic demand, and some stock building in anticipation to lower PP output in the south.

PP domestic prices in Brazil increased R$300/t or $58/t in February after rolling over in January. In the last 12 months, Brazilian domestic prices contracted by $191/t.

Cumene's production and sales in 2022 fell from 2021, tracking lower demand.

Exports of other propylene derivatives fell in January, with a fall of 83pc in acrylic acid sales and no acrylonitrile exports.

The acrylic acid production in Brazil will expand 105,000 t/yr with Basf's investment of $300mn. The acrylic complex in Camaçari, Bahia, has 160,000 t/yr and 90pc of the current production stays in the country.

In Argentina, the government obtained a new loan from the World Bank for $450mn. From that, $300mn will be driven to the education sector and $150mn to support planned urban growth that will allow more inclusive access to housing.

In February, PP domestic prices in Argentina increased $150/t, tracking the international propylene prices and with domestic sales helped by import restrictions.

Restrictions on imports favor domestic producers, increasing their sales by reducing competition, even at high prices. In January, Argentinean PP imports fell 40pc to 7,700t from January 2022, with the average prices falling 25pc from $1,938/t to $1,460/t. South America led, despite losing market share from 73pc in January 2022 to 65pc in 2023, priced at the average of $1,275/t. Africa-Middle East fell from 17pc in January 2022 to 12pc at $1,196/t. There were no PP exports in January, with production driven to domestic market.

Propylene and ethylene supply are in line with PP output in February.

Colombia closed 2022 with PP imports of 89,900t, by 4pc less than in 2021, with an increased average price from $1,707/t in 2021 to $1,799/t in 2022. South America kept its position as the top supplier, although with a market share loss from 37pc in 2021 to 34pc in 2022 at the average price of 1,769/t. Asia-Pacific had 33pc at $1,707/t, Africa-Middle East and North America had 12pc each at $1,757/t and $1,896/t. PP exports were 283,100t, slightly inferior to those in 2021. South America had 62pc market share at $1,706/t, and North America 21pc at $1,764/t. The exports from the Free Zone increased 26pc to 23,900t, at $1,714/t.

Esenttia is waiting for a demand improvement to run its new capacity at full rates. It has concluded the commissioning of the second step of its PP expansion project to reach 570,000 t/yr.

In Chile, unemployment is up 15.2pc and stood at 8pc in the mobile quarter between November 2022 and January 2023, according to National Statistics Institute (INE).

PP imports and exports declined in 2022 from 2021. Imports fell 26pc to 55,500t, with the fall shared among all regions. PP copolymer had 28pc of the total, and copolymer 72pc. South America kept 61pc market share, Asia-Pacific increased 1p.p to 32pc, while North America lost 2p.ps to 2pc, and Africa-Middle East had the same 1pc. Exports ended the year with 40,500t, 32pc fewer than in 2021, mainly driven to South American countries, basically homopolymer priced at the average of $1,545/t.

WESTERN EUROPE

The European propylene market remains long. There are tentative signs of improving downstream demand, but everyone remains cautious with a focus on optimisation and control of inventories throughout the value chain. The March monthly contract price (MCP) settled this week with a €30/t increase to €1,185/t, which matched the increase in average naphtha prices.

Spot prices for propylene are still at wide discounts to the MCP, but activity has picked up, some of which is linked to incremental demand opportunities for derivatives. There was a deal late last week for end-February at a 25pc discount, but March prices are mostly talked in a 15-20pc range of discount. Discounts for chemical grade propylene are wider but have narrowed slightly with deals reported at 33pc and 35pc discounts for March deliveries fd inland and cif NWE, respectively.

The propylene balance remains long for the current demand levels and despite crackers cutting back operating rates to around 75pc, we estimate, and some planned and unplanned maintenance. A cracker in France remains off line with a tentative restart date in mid-March. Planned maintenance is taking place at a refinery in Germany and another in Italy. There is also maintenance at some on-purpose and splitter capacity, but timed to coincide with downstream maintenance. Excluding operating rate reductions because of weak demand, less than 4pc of total west Europe propylene capacity is unavailable, a relatively low level. Refineries are running at good rates, except where there are feedstock limitations, and if improving propylene demand is at least matched in the ethylene chain then the overall balance may not change much. Still with cracker operators focused on maintaining a tight or managed balance, there is limited flexibility in the short term to adjust operating plans if demand is better than expected or if new production issues emerge.

There is some evidence that as bad as demand in the chemicals and plastics chain was in the fourth quarter of 2022, underlying economic activity was relatively robust. Production indices from the EU's statistics office, Eurostat, highlight the sharp slowdown in European chemicals and plastics production during 2022, which accelerated in the second half of the year. This is no surprise, yet equivalent production indices for overall industrial production and other key market segments were relatively robust. The exposure of the industry to high energy prices and the need to cut gas and power use, destocking throughout the chain and higher share of imports in the market, may all contribute to the divergence in the indices. If underlying activity is more robust than feared, then the downturn in chemicals and plastics production may reverse sooner

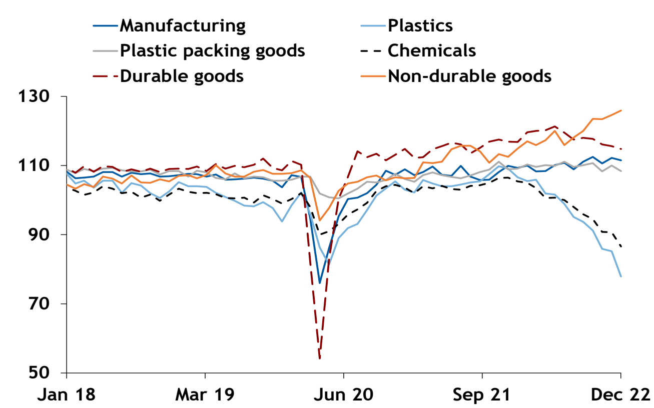
Western Europe prices				€/t
	Timing	Low	High	Mid
Propylene				
Poly grade NWE cif spot		890	980	935
Chem grade NWE cif spot		740	790	765
Polypropylene				
PP Homo GP IM del spot 24 Feb*	Feb			1,455
Copolymer del 24 Feb*	Feb			1,525
Acrylonitrile				
Monthly feedstock cost delta	Feb			+33

**freely negotiated monthly prices*

Western Europe contract pricing (MCP)		
	$/t	€/t
Poly grade		
Mar	1,257	1,185
Feb	1,255	1,155
Jan	1,148	1,075

Western Europe feedstock prices		
	Price	Diff to previous month
Naphtha para 65 cif NWE barge averages (€/t)		
Feb (Month-to-Date)	671	+0
Feb	671	+32
Jan	640	+78

Industrial production index, selected sectors EU27 *2015=100*



— Eurostat

WESTERN EUROPE

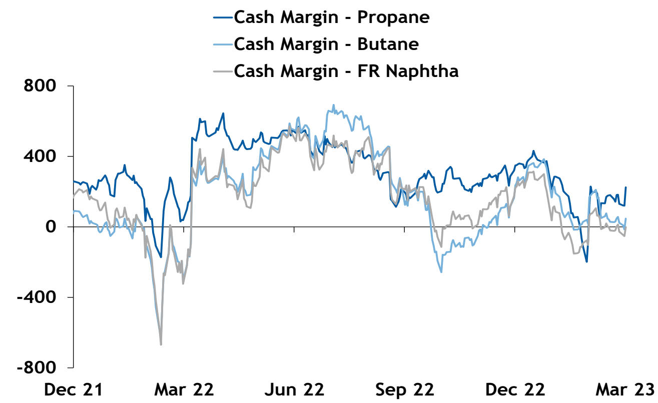
than pessimistic forecasts.

The March MCP negotiation was a rerun of the February MCP settlement, with market conditions essentially unchanged for both monomers. Modelled naphtha cracker margins are at breakeven and it will be difficult for derivative producers to pass on a price increase to their downstream customers. For producers it barely covers the increase in feedstock costs and any further rises will quickly return cracker margins to negative values, while for converters the increase will put further pressure on margins.

The phenol chain remains under pressure with some domestic production idled. Increased phenol imports have been partly compensating for reduced domestic output, with operating rates of phenol-acetone units across Europe remaining heavily curtailed, under pressure from weak phenol demand and margins. Northwest Europe's net imports of phenol rose to 136,000t in 2022 from 124,000t in the previous year, far above pre-pandemic levels of less than 40,000t, latest Eurostat data show. US and the Mideast Gulf were the main sources of these imports. Acetone supply has tightened.

Demand for polypropylene in February was the strongest since mid-2022 according to several producers, although this was only clear at the end of the month because of the lack of visibility and confidence in orders beyond the prompt. It also says as much about the weakness of demand through the end of 2022 and January. March nominations are also described as improving and while overall demand is still not strong, the positive signs will be encouraging to producers. Translating cautious signs of a demand improvement into recovery of the propylene feedstock increase in March or even margin improvement will be the challenge. Buyers remain cautious, see no problems with availability and may attempt to resist price increases.

Western Europe net cracker cash margin *€/t*



— Argus Consulting

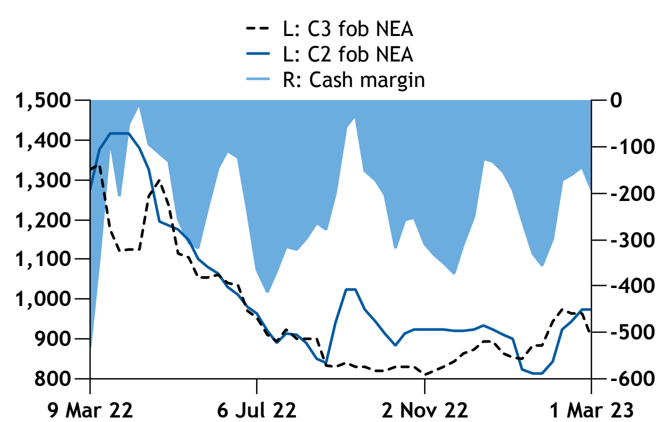
ASIA-PACIFIC

Upstream and cracker margins

Losses in butadiene and propylene prices weighed on cracker margins this week despite modest gains seen in ethylene values. Naphtha-based cracker margins dropped to -$191/t, down from -$144/t compared with last week. Naphtha prices were stable at an average of $722/t cfr Japan, up by $1/t compared with last week.

Meanwhile, losses in propane prices lent support to production margins for propane-based crackers. Margins rose to -$75/t, up by $113/t compared with last week. Propane prices have been on a downtrend since early February, falling by around 21pc from an average of $835/t cfr Japan on 1 February to $661/t cfr Japan on 1 March. Propane dehydrogenation (PDH) margins also recovered to -$49/t this week, up by $99/t from last week on lower propane values.

Asian cracker cash margin spot *$/t*



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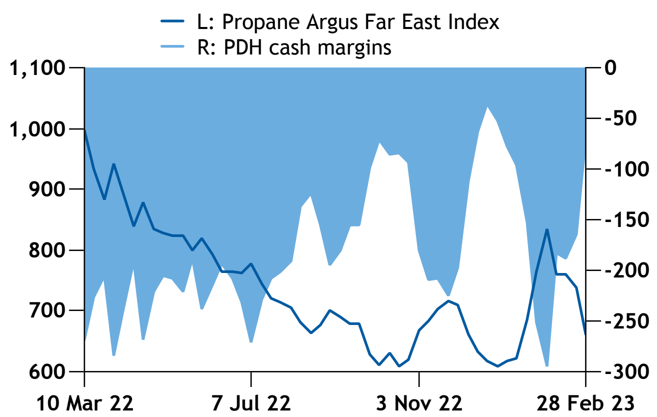
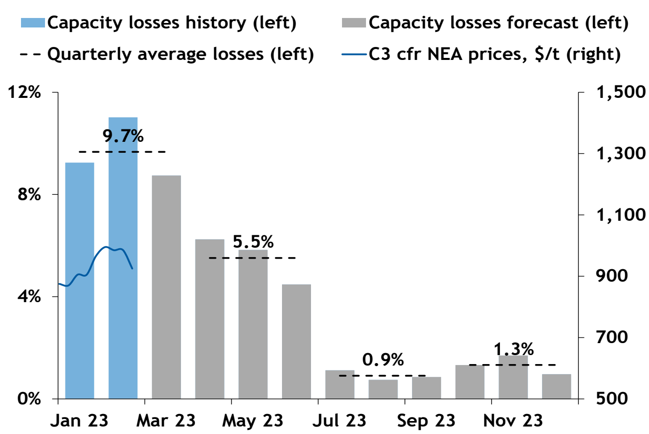
PDH cash margin, based on propane AFEI $/t



Asia propylene capacity loss 2023 %



February's production losses ended at 11pc, up by 0.6pc compared with the initial forecast in response to more shutdowns seen at PDH plants in China owing to weak production margins. Propylene output is expected to increase in March with more crackers increasing their run rates given recovery in margins. PDH producers in China are also mulling to restart their plants, anticipating higher margins and lower propane contract prices. March production losses are forecasted to be at 8.7pc, with South Korea's YNCC restarting its No.2 cracker and increased run rates at Hanwha Total's cracker. PDH producers such as Tianjin Bohua, Shaoxing Sanyuan, Zhejiang Huahong and Huifeng Haiyi are due to restart their crackers in March after completing maintenance, while other PDH operators could also increase run rates or restart off line plants as production margins show signs of recovery.

Asia-Pacific prices	Timing	Low	High	Mid	±
					$/t
Poly grade propylene					
SE Asia cfr spot		1,010	1,050	1,030	+20
SE Asia fob spot		960	1,000	980	+20
NE Asia cfr spot		910	940	925	-60
NE Asia fob spot		890	920	905	-60
east China domestic *Yn/t*		7,450	7,550	7,500	-25
Sinopec east China domestic *Yn/t*				7,500	nc
Polypropylene					
Raffia cfr China 24 Feb		960	980	970	0.00
Copolymer cfr China 24 Feb		990	1,000	995	-10.00
Acrylonitrile					
China cfr spot		1,530	1,600	1,565	0.00
Propylene oxide					
del east China *Yn/t*		9,950	10,900	10,425	+550
del east China		1,162	1,273	1,218	+54

Asia-Pacific contract pricing	$/t	€/t
Poly grade Taiwan		
Jan	915	853
Dec	910	857
Nov	905	860

Propylene

The following deals were done in the past week:

- Buying ideas: $910-940/t cfr northeast Asia, March arrivals.
- Selling ideas: $940-970/t cfr northeast Asia, March arrivals.
- Deal: 1 lot, March arrival, likely at $933/t cfr China.
- Deal: 1 lot, first-half April arrival, $1,050/t cfr southeast Asia.

Asian propylene prices retreated as downstream buyers continued to show strong resistance to hikes in prices because of eroding production margins. Lower propane prices led to some producers mulling restart of PDH plants, which also exerted pressure on propylene values.

Buying ideas dropped to $910-940/t cfr China for March arrivals, while some market participants were quoting lower bids at $900/t cfr China midweek. Sellers also lowered their offers to $940-950/t cfr China, but some continued to hold

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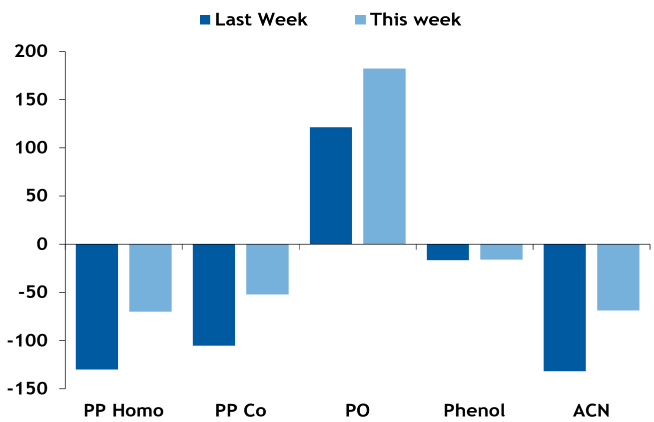
NEA propylene stand-alone derivatives margins $/t



Outages			
Shutdown	**Plant**	**KTA**	**Duration**
Restarted			
SCG ROC	Cracker	400	15Sep, extended earlyFeb
CPC No.6	Cracker	360	20Jan-13Feb
Zhejiang Xingxing	MTO	300	19Oct-6Jan
Jinneng Technology	PDH	900	15Dec-endJan
Zibo Xintai	PDH	300	17Jan-earlyFeb
Qixiang Tengda	PDH	700	1Feb, 1 week
Wanda Tianhong	PDH	450	8Feb, 7 days
Jvzhengyuan	PDH	600	20-25Feb
Ongoing			
Formosa No.2	Cracker	515	11Jul, extended across Q1
YNCC No.3	Cracker	270	1Oct, extended to 5-10Mar
Yangzi Petrochemical	Cracker	175	7Dec, restart unclear
Hyundai Chemical	Cracker	450	31Jan-endJune
ExxonMobil No.2	Cracker	500	5Feb-midMarch
PTTGC I4 No.2	Cracker	40	endJan, 2months
IRPC	Cracker	175	earlyFeb, 45days
Zhejiang Petrochemical No.2	Cracker	700	15Feb, 20days
JG Summit	Cracker	280	17Feb, duration unclear
Sinopec Zhenhai No.1	Cracker	600	endFeb-midMay
Nanjing Chengzhi No.1	MTO	170	7Aug, restart unclear
Luxi Chemical	MTO	180	11Nov-extended to Mar
Jiangsu Sailboat	MTO	470	10Dec-extended to Mar
Anqing Taiheng	PDH	300	14Jan, restart unclear
Puyang Far East	PDH	150	27Jun, restart unclear
Tianjin Bohua	PDH	600	11Jan-midMar
Shaoxing Sanyuan	PDH	450	6Jan-earlyMar, extended
Shandong Huifeng Haiyi	PDH	600	31Jan-earlyMar
Zhejiang Huahong	PDH	450	earlyFeb-midMar
Zhejiang Satellite No.2	PDH	450	8Feb, restart unclear
Hebei Haiwei	PDH	500	20Feb, restart unclear
Ningxia Runfeng	PDH	300	25Feb, 40-50days
ENEOS Chiba No.2	FCC/RFCC	50	2HFeb-1HMay
Expected			
Idemitsu Kosan Chiba	Cracker	210	27Mar-13June
Ningbo Kingfa	PDH	600	endMar-earlyMay
Ningbo Fund	MTO	400	19Feb, 10 days
Formosa No.1 FRCC	RFCC	375	earlyMar, 30days
S-Oil RFCC No.2	RFCC	700	10Mar-25Apr
New plants			
Shenghong Petrochemicals	Cracker	550	Onspec 1Dec
Sinopec Hainan	Cracker	500	To feed in on 10Feb
Guangdong Petrochemical	Cracker	600	Startup 4-5Feb
Wanda Tianhong	PDH	450	Onspec early Nov22
Liaoning Kingfa	PDH	600	Onspec 28Nov22
Guangxi Huayi New Materials	PDH	750	Onspecc end Feb
Guangzhou Jvzhengyuan No.2	PDH	600	Trial run in Feb
Yanchang Zhongran Taixing	PDH	600	Fed on16-17Feb

their ideas at $960-970/t cfr China, citing tight supplies in the market. A March-arrival cargo was sold to a main propylene oxide buyer at $933/t cfr China late last week.

Sentiment weakened since late last week as buying interest dwindled in anticipation of more supplies in the market given upcoming restarts of PDH plants. The Propane *Argus* Far East Index fell by 25pc from $867.25/t on 20 January to $646/t on 23 February. The recovery in PDH production margins because of lower propane prices resulted in PDH operators mulling plant restarts, as well as a likely increase in propylene supplies and higher PDH operating rates in March, market participants said.

Some PDH plants are due to complete their turnarounds soon. Tianjin Bohua and Zhejiang Huahong will restart their 600,000 t/yr and 450,000 t/yr PDH plants by mid-March. Huifeng Haiyi Petrochemical is also due to restart its 250,000t/yr by early March.

Other off line PDH plants include Hebei Haiwei's 500,000 t/yr PDH unit, Juzhengyuan's 600,000 t/yr PDH line, Puyang Far East's 150,000 t/yr PDH plant, Shaoxin Sanyuan's 450,000 t/yr PDH unit and Zhejiang Satellite's 450,000 t/yr PDH plant. This week's estimated PDH operating rates were at 63pc, with PDH run rates below 70pc since the beginning of February.

The rapid expansions of PDH plants in China during 2021-2023 have resulted in a steady decline in PDH operating rates. Year-to-date PDH run rates in 2023 were at at 68.5pc, given the rises in propane prices, which eroded production margin.

Losses in the domestic market as a result of subdued

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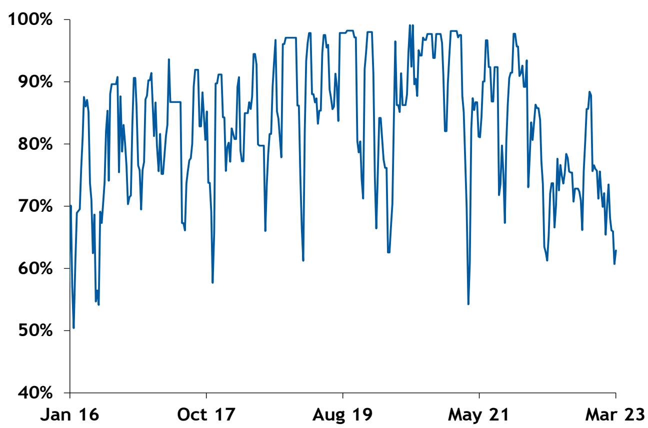
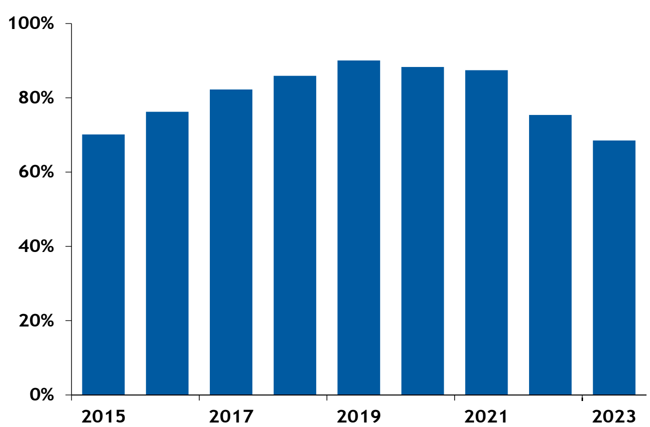
China PDH operating rates %



China PDH yearly average operating rates %



downstream demand and the rapid depreciation of the yuan against the US dollar also weighed on propylene sentiment and import interest. Ex-tank prices edged down to Yn7,450-7,550/t in east China, down by Yn50/t compared with last week and equivalent to $947/t on an import parity basis. Ex-tank prices in Shandong declined from Yn7,450-7,550/t on 23 February to Yn7,380-7,450/t on 28 February, down by Yn85/t or about $936/t on an import parity basis.

But regional supplies are likely to increase because of higher cracker operating rates, as production margins recover on hikes in ethylene prices. Taiwan's Formosa is mulling to restart its long-idle No.2 cracker soon, but the exact timeline is still under discussion. South Korea's LG Chem, Lotte Chemical and KPIC plan to increase operating rates in March-April. A Singapore-based cracker producer also increased operating rates to 80-85pc in February and March as margins improved.

Unlike northeast Asia, sentiment in southeast Asia remained firm in response to heavy cracker turnaround season in the region, which include Singapore's ExxonMobil No.2 cracker, Philippines's JG Summit cracker and Thailand's PTTGC and IRPC crackers. Buying ideas were quoted at $1,000s/t cfr southeast Asia this week with a deal done for first-half April arrival at $1,050/t cfr southeast Asia. Supplies from regular seller Malaysia's PRefChem are expected to dwindle as its associated PP plants have begun operations, according to market participants.

Polypropylene (PP)

China's PP prices fell slightly this week, in line with lower PP futures. PP futures fell because of lower crude oil futures earlier this week and had a mild rebound later in the week.

Producers and traders cut their prices accordingly to boost sales. Spot trades in the domestic market picked up strongly as prices fell. Downstream converters replenished their depleted feedstocks at comparatively low prices. Operating rates in the plastic woven industry inched up to 40pc from 39pc in mid-February, while run rates for biaxially-oriented PP (BOPP) were unchanged at 63pc.

Ex-works prices for PP raffia were assessed at 7,700-7,950 yuan/t in east China, or an import parity equivalent of $905-935/t, down by Yn50/t from the previous week's high end. PP co-polymer prices were assessed at Yn7,850-8,100/t ex-works in east China, down by Yn50/t from last week's low end.

Major Chinese producers' inventories of PP and polyethylene increased to 790,000t on 1 March, up by 60,000t from 22 February. Average operating rates at Chinese PP plants edged higher to 77pc, up by one percentage point from the previous week. Guangdong Juzhengyuan shut its two 300,000 t/yr PP units on 21 February together with its upstream PDH unit for about two weeks of maintenance. Zhenhai Refinery commenced maintenance at its 300,000 t/yr unit from 27 February-14 May. Beihai Refinery started a two-week maintenance at its 200,000 t/yr unit on 26 February.

The import market was quiet as limited new offers were quoted this week. A Saudi producer quoted March-loading PP injection at $980/t cif China, while PP co-polymer was at

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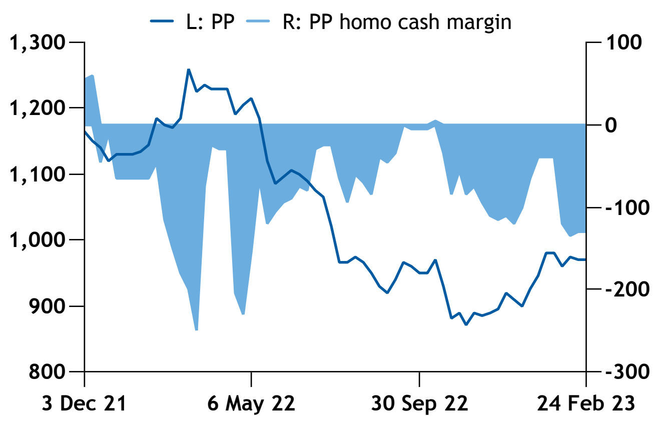
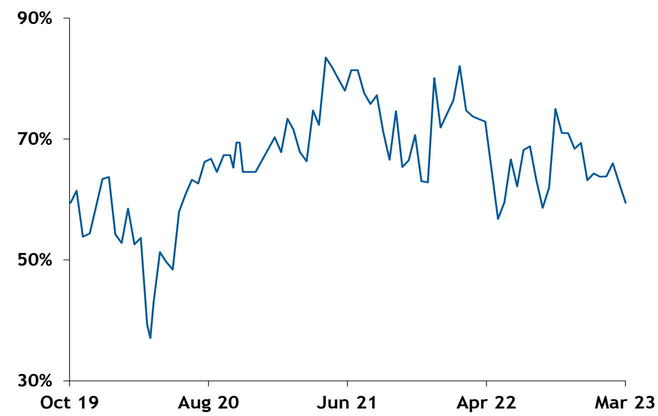
PP homopolymer non-integrated margin $/t



China PO operating rates %



$1,000/t cif China. Prices were finalised at $960-980/t cif China for PP injection. Notional buying ideas for PP co-polymer were at $960-980/t cif China. Trading firms quoted PP raffia and PP injection at $980-1,000/t cfr China, while PP co-polymer was at $990-1,010/t cfr China with no deals finalised. The rapid depreciation of the Chinese yuan against the US dollar weakened buying interest for import cargoes. PP raffia prices were assessed unchanged at $960-980/t cfr China. PP co-polymer prices were assessed at $980-1,000/t cfr China, down by $10/t from the previous week's low end.

Export activities waned further this week. China-origin PP raffia was traded at $1,030-1,070/t fob China. Chinese BOPP film grade was done at $1,030/t fob China. Middle Eastern-origin PP injection was re-exported at $1,030/t fob China. These cargoes were mainly destined for southeast Asia and European countries. Freight rates from China to Vietnam were $15-20/t, while rates from China to south Asia and to Latin America were $30-40/t and $60-80/t respectively, according to market participants. Export prices for PP raffia were assessed at $1,030-1,070/t fob China, down by $10/t from the last assessment's low end.

Propylene oxide (PO)

Chinese's domestic PO prices extended gains this week in response to higher cost of feedstock chlorohydrin and reduced supplies in the market given rate cuts and shutdowns at plants.

Delivered PO prices increased steadily to Yn9,950-10,900/t by 1 March, up by Yn550/t compared with previous week. This is the first time in eight months that delivered PO prices breached the Yn10,400/t level, as a result of tightening supplies and higher chlorohydrin costs.

A slew of plant turnarounds and shutdowns resulted in Chinese's PO operating rates dipping to below 60pc for the first time since August 2022, settling at just 59pc. Sinopec Zhenhai shut one of its PO plants with 270,000 t/yr production capacity on 24 February for 70-75 days maintenance. Shandong Daze also shut its 100,000 t/yr chlorohydrin-based PO unit on 21 February for maintenance. Sinopec Tianjin Petrochemical took its new 150,000 t/yr PO unit off line on 11 February for maintenance. Six other PO units are also under shutdown. These include Najing Hongbaoli's 120,000 t/yr PO unit, Jiangsu Fuqiang's 100,000 t/yr PO line, Jiangsu Yida's 150,000 t/yr PO plant, Zhonghai Fine Chemical's 62,000 t/yr PO unit, Qixiang Tengda's 300,000 t/yr PO plant and Jilin Shenhua's 300,000 t/yr PO line.

Satellite's new 400,000 t/yr PO unit is still under trial runs and likely achieved on-specification production in mid-February, but some market participants said that the plant is not in stable operation yet.

Downstream demand is likely to recover further as spring season in March is typically a peak season for polyether flexible foam demand, as more construction works are carried out because of warm weather. Tighter supplies coupled with improved downstream demand are likely to provide pricing support to PO in March.

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While prices for PO climbed to eight-month highs this week, rises in feedstock chlorohydrin and propylene values reduced production margins at most non-integrated chlorohydrin-based PO plants to around Yn1,265/t this week, down from Yn1,500/t two weeks earlier.

Acrylonitrile (ACN)

Chinese ACN prices in the eastern region were largely stable this week alongside balanced supply-demand dynamics. But recent plant shutdowns might result in reduced supplies, which will likely underpin ACN sentiment.

Ex-tank ACN prices were hovering at Yn10,900-11,000/t this week, down by a mere Yn25/t compared with a week earlier or about $1,357/t on an import parity basis. There were no discussions in the cfr China market and prices were rolled over from the previous session at $1,530-1,600/t.

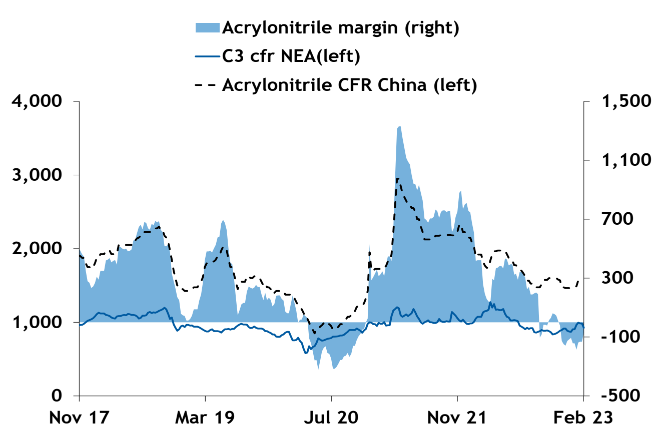
Operating rates at Chinese ACN producers were marginally lower this week at 73pc, down by 3pc compared with two weeks earlier. The production losses came from Keruer's 130,000/yr ACN plant shutdown on 28 February for 15 days. Market participants expect that the shutdown of Keruer's ACN unit to cause some supply shortages in the Shandong market. Zhejiang Petrochemical's 260,000 t/yr ACN unit is likely to restart again by the end of March after a shutdown on 15 February.

There were two new plant start-ups in February, including Jilin Petrochemical's new 130,000 t/yr ACN unit and CNOOC Hainan's new 200,000 t/yr ACN plant. Jilin Petrochemical is operating its plants at 70pc, while CNOOC Hainan is likely operating one of its two ACN units.

Downstream demand remained stable. Operating rates at acrylic fiber plants were stable at 72pc this week, while run rates for acrylonitrile-butadiene-styrene in China were lower because of squeezed production margins, at 80-85pc.

Productions margin for ACN are still depressed as ex-tank propylene prices in China were largely stable this week. Non-integrated production margins among Chinese ACN producers were at minus Yn325/t, down by Yn1/t compared with last week or about $47/t.

ACN non integrated margin *$/t*



Downstream outages			
Shutdown	**Plant**	**KTA**	**Duration**
Yangzhou Shiyou	Ph/Ac	200/120	28Feb-6Mar
Shenghong Petrochemical	Ph/Ac	400/250	Started earlyFeb, run at 70pc
Sinochem Ruiheng	Ph/Ac	400/250	Started earlyJan, run at 50pc
Guangxi Huayi	Ph/Ac	175/105	to start up in Mar
Zhejiang Petrochemicals	ACN	260	15Feb, 45days
Keruer	ACN	130	28Feb, 15days
Jilin Petrochemical	ACN	130	Onspec 11 Feb
CNOOC Hainan Dongfang	ACN	200	Feed in earlyFeb
Zhonghai Fine Chemicals	PO	62	1Nov21, restart unclear
Jinling Huai'an	PO	100	14Oct21, likely April
Nanjing Hongbaoli	PO	120	MidApr22, restart unclear
Jilin Shenhua	HPPO	300	9Oct, restart unclear
Qixiang Tengda	HPPO	300	25Dec, restart unclear
Jiangsu Yida	HPPO	150	14Dec, restart unclear
Sinopec Tianjin Petrochemical	PO	150	11Feb, likely April restart
Zhejiang Satellite	PO	400	Feed in Feb
Sinopec Zhenhai	POSM	280	24Feb, 70-75days
Shandong Daze	PO	100	21Feb, likely March

Phenol/acetone

China's phenol market reached a three-month high of Yn8,250-8,300/t ex-tank Jiangsu on 23-24 February before a slight fall to Yn8,050-8,150/t at the close of the assessment week.

Curtailed supply lent the major support to the market earlier in the week. Major Chinese producers have continued production cuts owing to negative margins.

Average run rates at Chinese phenol plants slipped to 80pc this week from 85pc in mid-February. Yangzhou Shiyou shut

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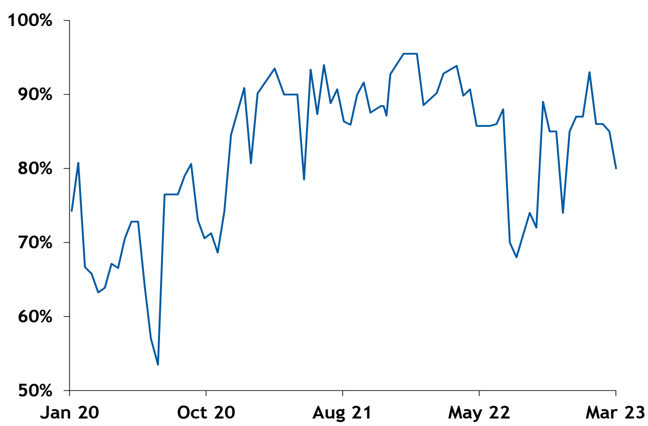
China phenol, acetone plant operating rate %



its 200,000/120,000 t/yr phenol/acetone plant on 28 February for a week-long maintenance. Some producers are planning turnarounds in April-May, including Shanghai Cepsa and Shanghai Gaoqiao.

Two new plants that started operating in January-February — Sinochem Ruiheng and Shenghong Petrochemical — have maintained low rates of 50-70pc because of margin concerns. *Argus* has started including the two new phenol plants in calculating operating rates, since the week to 15 February.

Import supplies increased slightly with port inventories in east China climbing to 22,000t, 7,000t more than two weeks earlier.

With feedstock propylene and benzene prices correcting downwards, non-integrated phenol margins in China rose to -$16/t this week compared with -$75/t seen two weeks earlier. Other Asian producers' margins were estimated at -$123/t this week, halving losses from two weeks earlier.

Demand has been increasing, but at a slow pace. The rapid expansion of the major downstream bis-phenol A (BPA) sector, which outpaced phenol capacity growth, has provided support for phenol demand but also curbed BPA prices, which traded around Yn9,850/t this week, a marginal increase from a multi-year low of Yn9,650/t in early January.

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