

Argus LPG World

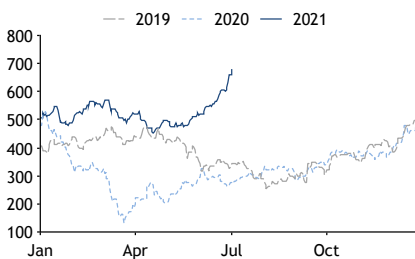
News, prices and analysis



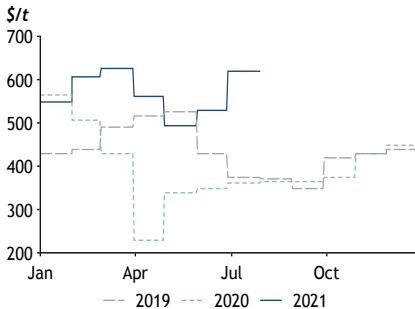
Volume XXVII, 13, 6 July 2021

The company has purchased at least two spot fob cargoes loading from its Baytown terminal

Propane cif ARA
\$/t



Propane Saudi CP
\$/t



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Enterprise buys spot cargoes as US Gulf prices surge

US midstream firm Enterprise Products Partners, the operator of the country’s largest LPG export terminal on the Houston Ship Channel, has been buying back its own August-loading cargoes as US propane prices surge.

The recent rise in Mont Belvieu propane prices on the Gulf coast has narrowed the arbitrage to Asia-Pacific and cut spot prices for fob export cargoes. Yet the move is unusual for a terminal operator, as a narrow US-Asia spread typically leads to cancellations or deferrals of cargoes. This is the first time Enterprise has been active in the spot cargo market, market participants say. The firm has bought at least two cargoes loading at its 835,000 b/d (26mn t/yr) Baytown terminal as of 2 July, market participants say. Enterprise declined to give further details.

The move is expected to tighten export availability on the Gulf coast and strengthen sentiment and possibly spot fob prices for August-loading cargoes. Delivered propane prices to Asia-Pacific rose to their highest since the beginning of this year – the Argus Far East Index price was \$690.50/t on 1 July. Argus assessed US Gulf coast fob prices at a 4¢/USG premium or slightly below to Mont Belvieu propane in early July, pulling the spread to the AFEI below \$100/t. This led to the cancellation of at least two fob cargoes for late July and early August loading. But the motivation for Enterprise, a US exporter, to buy back August-loading cargoes remains unclear. Market participants point to a wide propane-ethane spread, which has made loading low-ethane grade propane cargoes – only 2pc ethane compared with up to 5pc in domestic consumer-grade (HD5) propane – more costly.

Grade down

Argus assessed the Enterprise front-month in-well Mont Belvieu price at an 81.8¢/USG (\$357/t) premium to ethane on 1 July – the widest since October 2014. This would make a 44,000t low-ethane propane fob cargo at least \$560,000 more costly than an in-well HD5 shipment for the domestic market, without factoring in fob loading costs of at least 1.5¢/USG, or another \$300,000. Neither Enterprise nor the other terminal operators disclose loading costs, but estimates suggest a saving of as much as \$900,000/cargo by keeping the propane in the domestic market.

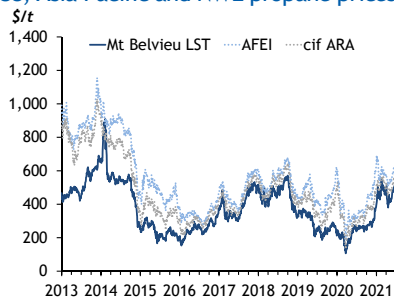
Additional factors that could incentivise Enterprise and other operators to buy spot export cargoes include the low fob values – with discussions at prices below those for term contracts. As a result, buyers with long-term contracts and favourable cancellation terms can cancel their term loadings and purchase cheaper spot cargoes. By reducing availability of spot supply, terminal operators can bolster fob prices and deter the move.

Regardless of Enterprise’s motivations, it remains unclear whether any meaningful decline in shipments will be sufficient to bring US propane stocks to the roughly 80mn bl (6.45mn t) needed to meet peak export and domestic demand over the winter season.

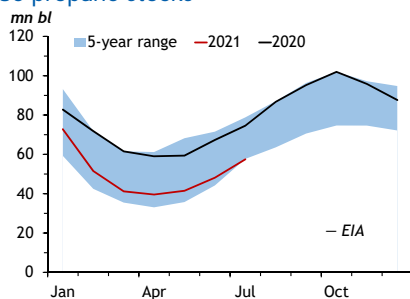
EDITORIAL

Supply concerns in the US are amplifying crude-led price gains while developing countries struggle with rising retail prices

US, Asia-Pacific and NWE propane prices



US propane stocks



High season

International LPG prices have increased sharply alongside crude's recent rally, and on bullish spot market sentiment despite the onset of summer, outpacing [recent Argus Consulting forecasts](#).

Spot LPG prices rose dramatically in the second half of June and early July. Propane and butane assessments in the US, Asia-Pacific and northwest Europe have hit multi-year highs, supported by crude's sharp gains, as well as some disparate, localised supply constraints (*see pp5-6*). But the underlying strength in sentiment is still coming from US inventory concerns in the off-season, with stockbuilding still not on a trajectory to secure levels by the peak winter season.

Crude has been the primary driver behind recent price increases, with benchmarks breaching \$75/bl in early July – their highest in over two years. The Opec+ group is trying to reach a new output restraint deal that will enable it to raise output in monthly increments of 400,000 b/d from August, and in doing so prevent a projected supply deficit by the end of this year. But it is struggling to get the UAE to sign up for an extended deal under the same production baselines.

Crude might be the engine behind LPG price gains, but atypically bullish sentiment in summer is the catalyst. Import market benchmarks have risen firmly on an outright basis but also relative to crude and naphtha in line with firm demand and limited local availability. This is just about maintaining arbitrages from the US as its prices soar on supply concerns and strong buying, leading to midstream firm Enterprise's unprecedented foray into the spot market (*see p7*). US propane stocks are still low compared with recent years and off course to reach the 80mn bl (6.45mn t) deemed sufficient to meet winter surges in domestic and export demand, while crop drying and gasoline blending buying could return as early as September.

The current difficulties are in stark contrast to last year, when Mont Belvieu prices in the US, and the Argus Far East Index and cif Amsterdam-Rotterdam-Antwerp (ARA) assessments in Asia-Pacific and northwest Europe were all more than a half lower in early July 2020 than they were at the start of this month – at \$266.50/t, \$322.25/t, and \$266.50/t, respectively. This in turn was significantly higher than the historical lows of \$107/t, \$187/t and \$133/t in late March 2020 during the early stages of the Covid-19 pandemic.

LPG's resilience during last year's crisis has often been voiced in *LPG World*. But it is worth noting that Mont Belvieu propane stood at just 49.6pc of weakened WTI crude on 1 July 2020. It stood at 62.8pc a year later. LPG demand was depressed during the first Covid-19 waves and lockdowns, just not to the degree of other oil products, while US natural gas liquids (NGL) output proved to be more resistant to upstream shut-ins than was initially feared.

Heavy weather

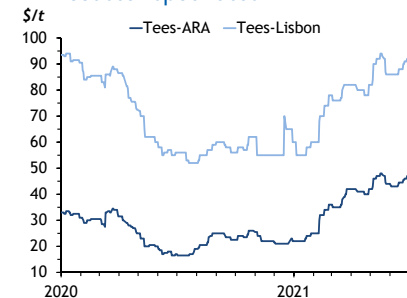
Last year's demand predicament has been replaced this year by supply problems. The most recent touchstone is 2013-14, when low summer stocks collided with strong crop drying demand in autumn, and a severe, prolonged cold snap in winter. AFEI and cif ARA prices peaked at \$1,155/t and \$1,027/t, respectively, that winter, while Mont Belvieu reached a high of nearly \$909/t.

Surging international LPG prices are anathema for distributors in large cylinder markets in the developing world. In India, Brazil and Mexico, retail prices are rising during a hard period for low-income users, forcing governments and state-run suppliers to consider the degree to which they can or want to intervene. Delhi has let cylinder prices rise again this month (*see p6*) as it cuts subsidies, while Brazil's state-controlled Petrobras has done the same to foster competition and investment (*see p9*). Mexican president Andres Manuel Lopez is veering the other way, mulling a cap on rising prices as he faces a mounting crisis over LPG theft (*see p12*).

SHIPPING

Pressurised carrier freight rates are ascending in the region as spot availability drops and LPG demand recovers from Covid-19 lows, writes Aidan Lea

NWE coaster spot rates



Global LPG fleet profile				
	Size '000m ³	Global fleet	On order	Order %*
Pressurised	3-13	338	15	4.4
Semi-ref	3-13	194	1	0.5
Fully/semi-ref	13-28	123	7	5.7
Fully/semi-ref	>28	442	94	21.3

* as a percentage of global fleet

— Clarksons, BWEK

NWE coaster rates on upward trajectory

Northwest European freight rates in the pressurised LPG carrier segment have doubled since the start of this year and nearly trebled from summer 2020 as vessel demand has recovered. And shipowners expect further gains as a result of the pick-up in global LPG and petrochemical trade.

The Covid-19 pandemic sent coaster rates to historical lows in northwest Europe. But the economic recovery and easing of restrictions since have boosted demand for pressurised ships, with the UK to Amsterdam-Rotterdam-Antwerp (ARA) route assessed at \$47/t in late June, up from around \$22/t at the start of this year and \$16.50/t in July 2020.

"There is more demand now than last year [owing to] European countries opening up," pressurised shipowner Stealthgas chartering manager Christian Krohn-Hansen says. "We think summer will be relatively quiet but we are optimistic for the fourth quarter and winter when the pandemic may be under control."

The key driver of the increase in regional pressurised vessel rates has been the LPG demand recovery in Europe, shipowner BW Epic Kosan (BWEK) chief executive Charles Maltby says. "Globally, LPG demand has been robust, as lockdowns have supported residential consumption for heating and cooking in markets such as Bangladesh, India, Brazil and parts of Africa. But petrochemical plant operations slowed and then rebounded," he says.

Consolidation in the segment this year has also reduced competition among owners, which brokers and owners say could further support rates. BWEK was formed in March when Singapore-based Epic Gas merged with Denmark's Lauritzen Kosan, creating a fleet of 77 pressurised carriers – the largest in the world. Another Danish owner, B-Gas, acquired the 3,300m³ *Matthew* and *Luke* vessels from Italy's Lumaship in June, now renamed *B-Gas Mate* and *B-Gas Monarch*, respectively. And Stealthgas has chartered its 5,000m³ *Eco Green* and *Eco Dream* to Norway's state-controlled Equinor for one year from this month. The firm now has no 3,500m³ vessels on the spot market and only one 5,000m³ ship – *Eco Dominator*.

"Our strategy has always been to have the majority of our fleet on time charters, but we try to time it when we see a good opportunity," Krohn-Hansen says. Time charter rates for 3,500m³ coasters have risen to around \$240,000/month from a low of \$150,000/month, while 5,000m³ rates have risen by about 50pc, he says. But the deals are only for six months or one year, as Stealthgas expects pressurised freight rates to continue rebounding.

The main spot participants in northwest Europe are now B-Gas, Chemgas, Anthony Veder, Unigas, Equinor and BWEK. This will likely lift rates, particularly as Lumaship often undercuts its rivals, Krohn-Hansen says. The effect should be swift although might not be seen clearly until the market gets tight, he says.

Fleet retreat

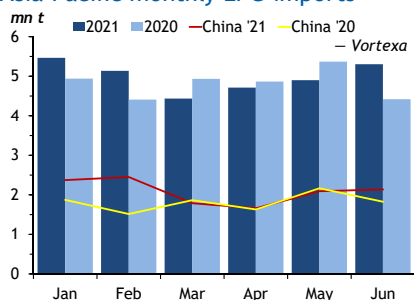
It is an overall decrease in vessel numbers that matters most, Maltby says. "Consolidation will not impact rates, whether there are six owners or nine." The regional fleet fell in 2020 after B-Gas scrapped ships, while owners such as Stealthgas relocated carriers to other markets where rates were firmer. Availability is expected to be modest going forward owing to a lack of investment in the segment, owners say. "Newbuild supply looks quite thin because it is difficult to know what to order – there are multidirectional discussions between shipowners, engine manufacturers, classification organisations, shipyards and regulators," Maltby says.

But any climb in spot rates is expected to reach a ceiling, with owners likely to relocate ships back to the region. "It is a balanced market – a couple of ships more or less can make a significant change to tip the balance one way or the other," Krohn-Hansen says.

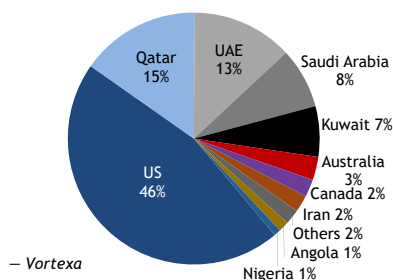
ASIA-PACIFIC

The expansion of China's PDH and ethylene cracker capacity continues to drive LPG import growth to Asia-Pacific, write Yaxiu Wang and Reza Amanat

Asia-Pacific monthly LPG imports



Asia-Pacific LPG import origin 1H21



China's rising appetite for US LPG lifts Asian imports

LPG shipments to Asia-Pacific increased by 3.6pc to 30mn t in the first half of 2021 compared with a year earlier, driven mainly by growing petrochemical sector consumption in the world's largest LPG importer, China.

The US increased its share as Asia-Pacific's largest single supplier, accounting for 44pc of imports in January-June, up from 39pc a year earlier, data from oil analytics firm Vortexa show. The Mideast Gulf also provided 44pc, which was down from 50pc a year earlier. US deliveries to Asia-Pacific rose by 1.63mn t on the year to 12.5mn t, which was largely the result of China's intake of US LPG more than doubling to 3.78mn t – offsetting a drop in US exports to Japan and South Korea.

This partly correlates to Beijing waiving import tariffs on US LPG imports in March 2020, but also China's rapidly expanding LPG and ethane-fed petrochemical production capacity and linked import infrastructure over the past two years. China's total LPG imports rose by 23pc to 10.3mn t in the first half of this year, Vortexa data show, while customs data show a similar trajectory, at 7.96mn t in January-April, up by 36pc.

China's propane dehydrogenation (PDH) capacity is expected to reach 10.5mn t/yr by the end of this year, equivalent to around 11.3mn t/yr of propane demand. LPG and ethane-fed ethylene cracker capacity will grow to 4.5mn t/yr in 2021 from 3.1mn t/yr last year. The US' propane supply abundance and comparatively low prices make it the obvious source for China's expanding PDH and cracker needs, which are concentrated on the east coast. A further three PDH plants and one ethylene cracker in east China are due to start in the second half of this year, adding around 1.76mn t of LPG import demand.

Japan continues to be the largest importer of US LPG, with its intake rising by 4pc to 4.1mn t in January-June as it diversified its suppliers. The country's total LPG imports rose to 5.4mn t from 5.3mn t, with more supply coming from new export facilities on Canada's west coast and from the Mideast Gulf. Imports from Canada rose by 58pc on the year to 577,000t, while they increased by 30pc to 557,000t from the Mideast Gulf, Vortexa data show.

South Korean LPG imports dipped in the first three months of this year on weaker residential, commercial and industrial demand, state-owned oil firm KNOCC says. The country's imports stood at 4.12mn t in the first half of 2021, compared with 4.5mn t a year earlier, with US cargoes accounting for 91pc of arrivals, down from 96pc, Vortexa data show. India, the world's second-largest LPG importer, kept its overseas purchases unchanged at 7.3mn t. The country's rapid demand growth over the past 10 years, which was expected to continue on rising consumption in rural areas, has been **stunted by higher LPG prices and the gradual removal of subsidies**, resulting in many low-income households switching back to firewood (see p4-5). The Mideast Gulf remained India's largest LPG source, meeting 96pc of its arrivals, compared with 90pc in the same period last year.

SOUTH ASIA

Further price gains in India are likely to force more low-income users to abandon LPG for cooking, writes S Dinakar

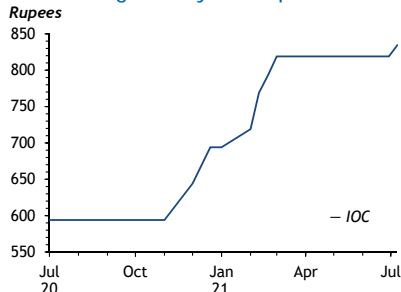
India risks LPG demand growth with fresh price hike

India's state-controlled refiners have increased LPG cylinder prices for July in line with international oil price rises, having kept them stable in the previous three months to coincide with state elections and a record outbreak of Covid-19.

The refiners, which control the domestic LPG industry, raised 14.2kg cylinder prices in Delhi to 834.50 rupees (\$11.30) compared with Rs809 in June, while 19kg cylinders used by business have risen by Rs76 to Rs1,550. State-controlled IOC says the increase reflects higher international crude prices.

LPG prices in the country have increased by Rs141, or a fifth, since the beginning

India 14.2kg LPG cylinder prices



of this year as the government has phased out subsidies despite the pandemic weighing on economic activity and leaving tens of millions of Indians jobless.

IOC has increased the price of autogas to Rs52.08/litre in July from Rs49.51/l in June. Gasoline prices in Delhi are Rs98.81/l, with federal and state taxes making up 56pc, and diesel is retailing at Rs89.18/l, with taxes making up 50pc.

India's LPG demand rose by 8.9pc on the year and 5.8pc on the month to 2.24mn t in June, oil ministry data show. Consumption was affected by the [sharp spike in Covid-19 infections](#) at the end of March, but overall the pandemic has supported residential demand for cooking because of lockdown restrictions. Demand was 1.78mn t in June 2019. But the recent hikes in prices and subsidy cuts are expected to have an impact once restrictions ease and workers return to offices.

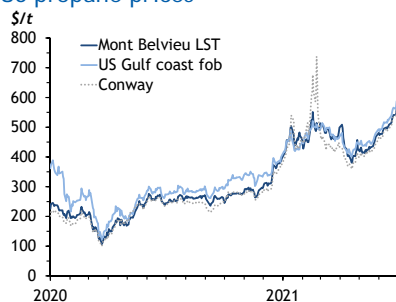
LPG demand growth in India relies on the further expansion of use among low-income and rural households, which has been aided by Delhi's [PMUY subsidy scheme](#). The pandemic shrunk the size of India's middle class — those living on \$10-20/d — by 32mn in 2020 and increased those in poverty — living on \$2/d or less — to 75mn, according to Washington-based think-tank Pew Research Center.

The government has concurrently reduced subsidies to just Rs27/refill — a tenth of what it was a few years ago. This has prompted some of the 81mn homes that qualify for the PMUY grant to switch back to firewood, industry officials say. This view was supported by a recent report from Delhi-based policy think-tank the Council on Energy, Environment and Water that found India's slum populations were increasingly turning back to solid biomass fuels as they could not afford refills. The annual refill rate of low-income homes was already less than half of that of middle-class urban ones before the pandemic.

NORTH AMERICA

Prices have risen with crude but also relative to Nymex WTI owing to inventory concerns and strong export interest during the off-season, writes Marialuisa Rincon

US propane prices



US propane prices surge into summer

US Gulf coast propane prices have risen to a seven-year high despite it being the summer off-season as tight domestic inventories, strong export demand and rising oil prices support the market.

Mont Belvieu LST propane rose to just over 112¢/USG (\$586/t) on 1 July, its highest since February 2014 and above the price spike in mid-February, when [freezing weather in the US](#) boosted demand and curtailed production. Mont Belvieu EPC propane was slightly higher, at 112.5¢/USG.

Cold weather over the winter heating season depleted US supplies that were already pressured by production curtailments caused by the Covid-19 pandemic. US propane stocks increased by 1.2mn bl to 57.5mn bl (4.64mn t) over the week to 25 June, government agency the EIA data show. But this was still 23pc lower than a year earlier and 17pc below the five-year average.

US propane production figures for June are not due to be released until August, but weekly data show output from gas processing rising over the week to 2.26mn b/d by 25 June. Exports rose to 1.2mn b/d, with strong international demand — China imported a record volume of LPG in May as its LPG-fed petrochemical production capacity continues to expand (*see p4*). Crude prices have seen strong demand-driven gains as travel picks up and the Covid-19 pandemic ebbs. August Nymex WTI crude rose above \$75/bl at the start of July, while LST propane reached 62.6pc of WTI on 1 July — its strongest value relative to crude since early April.

The arbitrage between the US Gulf coast and the midcontinent has narrowed despite the former's gains, with concerns over inventories in the Corn Belt region providing even greater support for prices. The Conway propane price reached 111.5¢/USG by 1 July, putting Mont Belvieu's premium at just 0.7¢/USG. Market participants estimate that a discount of at least 2¢/USG is needed to pull cargoes

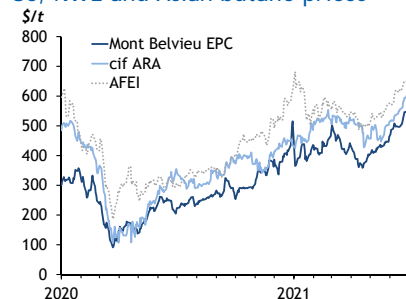
to the south coast. The closure of the arbitrage allowed midcontinent stocks to rise by 926,000 bl to 16.2mn bl by 25 June. Yet this is 26pc lower than a year earlier, with crop drying season due to start in September-October.

The gains have also narrowed arbitrages to Asia-Pacific and northwest Europe, although lower very large gas carrier freight rates and price gains in both regions have helped moderate the squeeze. The propane *Argus Far East Index* averaged a \$108/t premium to Mont Belvieu LST in June, reaching a low of \$92.50/t on 30 June. It has since risen back above \$100/t. The cif Amsterdam-Rotterdam-Antwerp premium to LST averaged \$53.90/t in June but jumped to \$81.60/t on 2 July after northwest European propane rose by nearly \$30/t.

NORTH AMERICA

Butane prices have soared as demand in northwest Europe and Asia-Pacific grows while US stocks fail to adequately replenish, write Ethan Stafford, Peter Wilton and Reza Amanat

US, NWE and Asian butane prices



US butane prices firm on strong export demand

US butane prices have risen sharply on strong export demand and concerns over inventories, supporting already elevated values in the key importing regions of northwest Europe and Asia-Pacific despite it being low-demand season.

US butane prices in the Mont Belvieu hub on the Gulf coast rose to 122.625¢/USG (\$555.50/t) on 29 June – its highest since October 2018. Recent increases in butane and propane have been supported by rising oil prices. But butane has also risen as a percentage of Nymex WTI crude, reaching 70.5pc on 29 June, 2.1pc higher than the value on 9 October 2018. The rise was supported by strong export demand and lower inventories, and is expected to continue into July, market participants say.

US butane exports rose to a record high of 472,000 b/d (1.31mn t) in April, up by nearly a third on the year, the latest data from government agency the EIA show. Butane inventories increased by 5.5mn bl to 31.1mn bl (2.8mn t), but crucially, this was 18pc lower than a year earlier and matches the concerns over US propane inventories with the high-demand winter season approaching.

The surge in US prices has also mirrored gains in northwest Europe, where prices are far above historical norms. Large cargo butane in the region is typically priced relative to naphtha but was priced at more than 90pc of the product in late June and early July, compared with five-year averages for June-July of just under 80pc.

Driving the price gain in northwest Europe has been a lack of US butane imports owing to an erosion of the arbitrage to northwest Europe, with firm US prices pushing the Gulf coast fob price to an average discount of just \$23/t to cif Amsterdam-Rotterdam-Antwerp (ARA) in June, which equates to a premium of \$26/t when adding average Houston-Flushing freight rates of \$49/t for the month. Local supply has also fallen as North Sea and Baltic Sea loadings fell to their lowest in at least four years in May, driven largely by maintenance at key Norwegian gas processing plant and terminal Karsto that lasted until mid-June. At the same time, petrochemical demand has firmed, pushing prices higher and beginning to tease open the arbitrage from the US in July.

A different set of constraints are hiking butane prices in Asia-Pacific, where strong import demand has supported US values and kept the US-Asia arbitrage open. The butane *Argus Far East Index* (AFEI) has been increasing relative to propane, demonstrated by June and July propane-butane spreads on Mideast Gulf CP swaps trading at minus \$2/t to flat. The main driver is the ratios of propane and butane in export cargoes. Core supplier to the region Saudi Aramco, which usually sells evenly split 44,000t propane-butane cargoes, has changed the ratios to 11,000t:33,000t propane-butane cargoes or 46,000t propane ones. But importers in India, Indonesia, Vietnam and the Philippines are still looking for 22,000t:22,000t ratios on their imports, driving butane prices higher.

EAST ASIA

Falling supplies of industrial-grade LPG in China could leave alkylation units increasingly short of feedstock

Chinese alkylation industry faces headwinds

Beijing's roll-out of new road fuel standards next month is expected to be a boon for China's growing alkylation sector. But its longer-term future is at risk from refinery integration, gasoline oversupply and a shift to low-emission vehicles.

The country's alkylation industry uses etherified butane, which is mainly iso-butane and butylene, as feedstock to produce alkylate – a premium gasoline blendstock owing to its high octane rating and lower emissions. The country is to implement the first phase of its China VI road fuel standards in July, and a second phase from July 2023. Similarly to the EU's Euro VI standards, these will require reduced olefins, aromatics and benzene in gasoline. Alkylate's comparatively low content of these substances, as well as its high octane rating and lower emissions, mean it is expected to be in even higher demand from next month, with no upper limit set in China on how much can be used in the gasoline blend. Around 8-10pc of gasoline produced in China last year was alkylate, *Argus* estimates.

China's alkylation industry grew rapidly in 2018-20, with capacity reaching 25mn t/yr by the end of 2020, up from 16mn t/yr in 2017, data from state-controlled refiner PetroChina show. Around 38 new alkylation plants of 9.7mn t/yr combined came on line over 2018-20, *Argus* estimates. But demand growth has lagged the rise in capacity, forcing alkylation plants to run at lower rates. Utilisation averaged 55pc in 2019 and dived to 32pc in the first half of 2020 as the Covid-19 pandemic hit, before recovering to 45-50pc in the second half of the year, PetroChina says. Run rates rose to 50-55pc in the first five months of this year in line with rebounding gasoline demand, state-controlled refiner Sinopec says.

A recent increase in downstream refinery integration is expected to cut feedstock availability, while rising domestic gasoline supplies and a government push to adopt new energy vehicles (NEVs) should depress margins and demand for alkylate. Independent alkylation plants, largely found in Shandong, east China, typically buy etherified butane from Sinopec and PetroChina, with smaller volumes imported. But around 73pc of the 9.7mn t/yr of alkylation capacity added in 2018-20 belongs to the two state-run firms and new private-sector refining and petrochemical complexes, such as Hengli Petrochemical's 400,000 b/d and Zhejiang Petrochemical's 800,000 b/d facilities, which will consume almost all of their own etherified butane.

Chinese supply of "industrial LPG" – mostly etherified butane – peaked at 12.4mn t/yr in 2018 before dropping to 10.5mn t/yr in 2019 following the launch of integrated alkylation units, Sinopec says. The firm expects output to fall to 8.6mn t/yr by 2023. This will leave alkylation facilities short on feedstock, which cannot be met through imports easily or cheaply. Chinese customs also classifies iso-butane as an oil product, meaning it is subject to 13pc value-added tax (VAT) and a 1.52 yuan/litre (24¢/l) consumption tax.

Foot off the gas

Gasoline oversupply in the country is also a mounting concern, with 1.5mn b/d of new refining capacity added in 2018-20, *Argus* data show. Another 1mn b/d will come on line by the end of this year. Much of this capacity is geared towards feeding integrated petrochemical units, but gasoline supply is still expected to expand, prompting Beijing to raise export quotas for oil products in early 2020 as refiners' margins become increasingly squeezed.

This pressure on refiners could grow as sales of NEVs surge. Chinese gasoline demand is expected to be flat in 2021-25, PetroChina says. Beijing has set a target for NEVs to make up 20pc of new car sales by 2025, while Chinese carmakers forecast NEVs to account for 70pc of total sales by 2030.

An increase in domestic etherified butane supplies at refineries would impact LPG importers' profitability, especially those serving the residential market in

China alkylation capacity additions '000t				
	2018	2019	2020	Total
Sinopec	500	1,700	1,200	3,400
PetroChina	1,340	830	650	2,820
Hengli, Rongsheng refineries	-	300	550	850
Other independent refineries	1,990	200	450	2,640
Total	3,830	3,030	2,850	9,710

Gasoline standards comparison				
	China V	China VI (1*)	China VI (2t)	EU VI
Sulphur ppm	10	10	10	10
Olefins %	24	18	15	18
Aromatics %	40	35	35	35
Benzene %	1	1	1	1
T50 °C	120	110	110	-

*from 1 July 2021 ffrom 1 July 2023

– PetroChina

Gasoline components comparison				
	Ole-fins %	Aromatics %	Oxy-gen %	Octane (RON)
FCC gasoline	15-50<	12-30	0	89-93
Reformate	<2	60-90	0	96-103
Alkylate	0	0	0	93-97
Isomerate	-0	-20	0	78-92
MTBE	0	0	18	117

– PetroChina

south China. When LPG prices are at a premium to naphtha, etherified butane prices can fall below residential-grade LPG, prompting refiners to blend the industrial LPG into the residential-grade supply. The propane *Argus Far East Index* (AFEI) was more than \$100/t above the naphtha equivalent in April 2020, leading to [refiners lifting supplies](#) partly with more etherified butane.

Wholesale prices are already under pressure in China from [higher LPG output](#) at refineries, erasing the profitability of import terminals. New Ocean Energy, which owns an import terminal in south China’s Guangdong province, recorded [substantial losses](#) in 2020, partly because of having to sell off inventories below purchase costs.

US SHALE

Rising costs, energy transition scepticism and the possibility of a carbon tax temper an otherwise positive view of the market, writes Stephen Cunningham

Cash windfall belies pressure on shale producers

A capital-disciplined US shale sector is achieving record free cash flow. But while crude prices above \$70/bl are reinforcing confidence and activity in the sector, executives expect growing investor, financial and regulatory pressures to firmly cap prospects for production growth.

Oil and gas executives remained upbeat in the second quarter as energy prices rebounded, according to the Federal Reserve Bank of Dallas, although concerns are growing over rising costs. The Dallas Fed’s energy survey of 152 companies in Texas, southern New Mexico and northern Louisiana on 9-17 June showed that activity grew strongly in the past three months. Drillers also plan to step up spending. But respondents voiced scepticism about the energy transition and the possibility of a carbon tax, as well as concerns about a less favourable regulatory environment under President Joe Biden. Three quarters of those polled see a global crude supply gap in the next two to four years.

A lack of new capital for oil and gas investment could hamstring the industry in the future, according to one upstream executive, who says just one institutional investor out of 400 that their company has worked with is willing to provide fresh funding. “This underinvestment coupled with steep shale declines will cause prices to rocket in the next two to three years,” the executive says. Dutch bank ABN Amro said on 24 June that it plans to exit oil and gas lending in North America, after agreeing to sell its \$1.5bn portfolio of loans to investment firms Oaktree Capital Management and Sixth Street Partners.

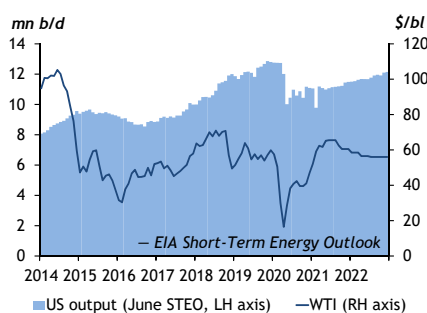
Shale drillers have had a “fairly tempered” response to this year’s rebound in oil prices, Hess chief executive John Hess says. Even if the sector’s rig count starts to rise quickly and shale growth accelerates, Hess estimates that it would take around four years for US oil output to get back to pre-Covid levels of 13mn b/d. Drillers are unwilling to sharply increase production, which “comes from the shale discipline exercised by investors and oil companies alike”, Hess says.

Low investment and oil prices above \$70/bl could help the world’s publicly traded upstream companies to report record free cash flow of \$348bn this year, consultancy Rystad Energy says. Shale, which has struggled to generate positive returns in the past, is on track to make close to \$60bn in free cash flow in 2021 before hedging, the firm estimates.

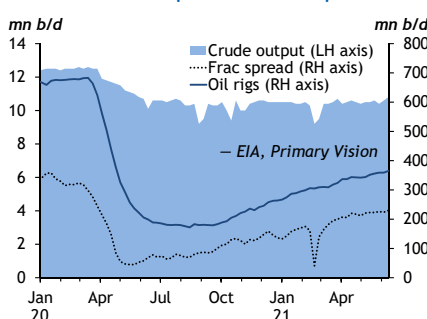
At the same time, oil service firm Schlumberger sees the potential for a demand-led supercycle as the market rebalances faster than previously expected owing to lower investment, and as the economy bounces back and US drillers and Opec+ exercise restraint. These factors set the stage for a “sustained growth cycle”, chief executive Olivier Le Peuch says.

But surplus capacity in the shale services sector means that firms cannot yet pass on their rising costs to drillers. “Cost inflation is killing us,” one executive says. Independent EOG Resources says that falling well costs are in line with its 5pc reduction target. “We have been able to lower well costs even in what is potentially turning into a bit of an inflationary environment,” president Ezra Yacob says.

US crude



US lower-48 output and frac spreads



BRAZIL

The company's decision to stop capping prices is expected to boost investor confidence and encourage competition in the domestic LPG industry, writes Flavia Pierry

'Petrobras needs to price LPG in a way that generates incentives and gives confidence to potential investors' – Sindigas

Petrobras allows LPG prices to climb with crude

Brazil's state-controlled Petrobras has allowed domestic LPG prices to rise in line with recent international oil price gains as it pushes ahead with its downstream divestment plans.

The company is making LPG prices more responsive to crude price fluctuations to attract potential buyers for its refineries, as well as encourage more imports of LPG as it relinquishes its role as the country's guarantor of supply. Petrobras aims to finalise the sale of its refining assets by the end of this year, with monopoly watchdog Cade approving the first this month – a \$1.7bn deal with Abu Dhabi's state-owned investment fund Mubadala for the 333,000 b/d Landulpho Alves refinery.

Petrobras' wholesale LPG prices rose by 83pc on the year to 3,209 reals/t (\$650/t) by 14 May, compared with a Brent crude price gain of 90pc. The two prices barely correlated in the preceding year, with LPG falling by 10pc on the year to R1,753/t by 15 May 2020 while Brent dropped by 52pc. Brazil's wholesale prices track international crude but Petrobras has only recently passed on fluctuations to LPG distributors, domestic association Sindigas says. Brazil's new natural gas law allows the LPG market to open up, as well as reducing its share of domestic refining, according to the association. "Petrobras needs to price LPG in a way that generates incentives and gives confidence to potential investors," Sindigas says.

The price of a 13kg cylinder of LPG for residential customers rose by around a fifth by May compared with a year earlier. Distributors say they have cut sales margins by nearly 14pc to help cushion the impact for their customers from higher Petrobras prices. The government also reduced LPG taxes by 6.79pc since the second quarter of 2020, while President Jair Bolsonaro stepped in to [freeze tax on diesel and LPG for two months in March](#) to prevent truck drivers from striking over rising prices. The move coincided with Bolsonaro replacing Petrobras chief executive Roberto Castello Branco with former army general Joaquim Silva e Luna.

Petrobras was only permitted to increase LPG and refined product prices frequently in 2015. The company planned for LPG prices to more closely track crude after a new board, installed in 2019, shifted its focus to upstream activities. But Covid-19 lockdowns and recent price increases delayed this move.

Petrobras' decision to allow LPG prices to track international markets is an important signal for companies wanting to invest in Brazilian refining and to start importing LPG, Brazilian energy consultancy CBIE director Pedro Rodrigues says. "It gives autonomy to the company and more confidence to investors that the government is not going to interfere in pricing."

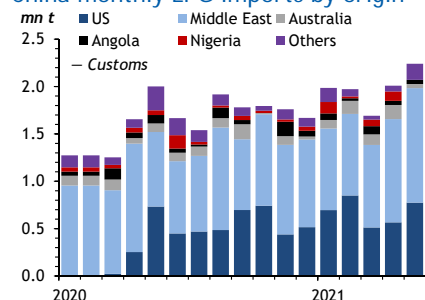
Tax shuffle

Brazil's senate this month approved a bill that seeks to increase taxes on banks and the chemical sector to maintain the tax freezes on diesel and LPG. An amended version of the bill will return to the lower chamber of congress for a final vote by 28 June. LPG prices are expected to influence a potentially momentous 2022 presidential election in Brazil, with former left-wing leader [Luiz Inacio Lula da Silva](#), who has criticised the privatisation of Petrobras assets, cleared in April to challenge Bolsonaro after his release from jail in 2019. Petrobras sold its LPG retail arm Liquigas to private-sector investment firm Itausa and domestic distributor Copagaz in 2020. It remains the dominant supplier in Brazil although Copagaz has signed two [import contracts](#) over the past two years for relatively small volumes.

ASIA-PACIFIC

LPG arrivals reached a fresh monthly high as PDH plants prepared to ramp up and a new flexible cracker started operations in east China

China monthly LPG imports by origin



China imports record volume of LPG in May

China's LPG imports hit a record high in May as importers replenished stocks, international prices fell and petrochemical demand for feedstock increased.

Imports rose by 11pc on the month and 12pc on the year to 2.24mn t in May – 1.69mn t of which was propane and 550,100t butane – latest customs data show. The move came as import prices started to retreat, with state-controlled Saudi Aramco's May propane contract price falling by \$65/t to \$495/t and US Gulf coast fob prices averaging \$451/t in May and \$432/t in April, down from \$484/t in March.

Strong petrochemical sector demand for LPG in east China, where the concentration of the country's propane dehydrogenation (PDH) and ethylene crackers are, also boosted imports. LPG arrivals in the region rose by 21pc from April to 1.56mn t in May, accounting for 70pc of China's total. The start-up of petrochemical producer Huatai Shengfu's ethylene cracker in April [raised import demand](#), with the facility expected to consume around 800,000 t/yr of imported propane when at capacity.

China's PDH operating rates fell to 85pc in April and 83pc in May because of maintenance. But importers for these facilities secured supplies in advance of restarts – rates gradually increased to 97pc by 23 June. LPG imports to south China fell by 14pc on the month to 429,200t in May. The region's consumption is weighted to the residential and commercial sectors, where use fell as temperatures rose.

The US continues to increase its share of the Chinese import market, accounting for around 35pc of LPG arrivals in May, compared with a 26pc share a year earlier – soon after [Beijing waived import tariffs on LPG](#). Exports from the Middle East still accounted for more than half of China's imports but the region's dominance has shrunk since the US began exporting to China again last year.

China's growing demand also supported Asia-Pacific spot prices for June deliveries. The propane Argus Far East Index (AFEI) rose by more than \$10/t from April to average \$546/t in May while the propane Argus Ningbo Index (ANI), which assess daily spot cfr Ningbo prices, averaged \$549/t, up by nearly \$13/t.

ASIA-PACIFIC

Uncertainty over production levels at the Prelude LNG facility and the future of other LNG projects has tempered LPG outlook, writes Kevin Morrison

Australia trims LPG output, export forecasts

The Australian government has cut its LPG production and export forecasts for the 2020-21 fiscal year that ended on 30 June, partly because of the restart of the 3.6mn t/yr Prelude floating LNG facility in January after an 11-month absence.

The country's Office of the Chief Economist (OCE) expects LPG output of around 112,000 b/d (3.52mn t/yr) for the 2020-21 fiscal year. This a drop of 3pc from the previous forecast of 115,000 b/d but still 7.7pc higher than 104,000 b/d in 2019-20. Australia exports the majority of its LPG production, and export forecasts have also been trimmed for 2020-21 – by 4pc from the OCE's last projection but slightly higher than in 2019-20.

Australia's LPG output and exports are expected to rise in 2021-22 before easing in 2022-23. The OCE says final investment decisions for a number of LNG projects may affect production and exports beyond its outlook to June 2023.

The country's LPG output hit a record high in 2020 amid the start-up of the 8.9mn t/yr Ichthys LNG project in the Northern Territory. The facility can produce up to 1.6mn t/yr of LPG, around 60pc of [Australia's LPG exports](#) last year. The Prelude facility offshore Western Australia has a smaller LPG output capacity of around 400,000 t/yr, but is still the second-largest LPG producer when at capacity.

Australia LPG forecasts	'000 b/d			
	2019-20	2020-21	2021-22	2022-23
Output	104	112	119	111
Exports	90	91	101	95
Output (March)	104	115	121	120
Exports (March)	90	95	101	100
				– OCE

ASIA-PACIFIC

Any LPG demand growth from tourism during the Tokyo Olympics is expected to be offset by falling heating and autogas use, writes Nanami Oki

Japan LPG unfazed by Olympic restrictions

Japan's LPG industry does not expect Covid-19 restrictions on the upcoming Tokyo Olympics, which will prevent foreign spectators from attending, to have a significant impact on overall LPG demand.

The Tokyo organising committee of the Olympic and Paralympic Games recently decided to ban foreign spectators, halve domestic spectator capacities at venues, forbid public viewings and encourage people to go home after events finish. The games and the correlating boom in tourism were expected to lift commercial and autogas demand in the country. But any gain would not have been enough to lift overall consumption, so the restrictions are unlikely to have much impact, according to domestic LPG organisations the Japan LP Gas Association (JLPGA) and the Japan LPG Centre (JLPGC).

The event, which was delayed from 2020 because of the pandemic, is due to take place in July-September during the peak of the LPG industry's low-demand season. A surge in tourism would not have affected heating demand but additional use for cooking would have provided limited overall support, the JLPGC says. And the introduction of higher-efficiency autogas taxis has already pressured autogas demand.

Japanese carmaker Toyota supplied its [hybrid autogas-electric vehicles in preparation for the event](#), allocating 11,140 units in Tokyo by the end of March 2020, according to the Japanese federation of hire-taxi associations. There were 43,080 taxis in Tokyo as of March.

Japan's economy, trade and industry ministry (Meti) has forecast a 0.6pc year-on-year [decline in household and commercial LPG demand](#) to 5.7mn t in the 2021-22 fiscal year ending in March. Meti expects a 47pc increase in autogas use to 669,000t in 2021-22, rebounding from the Covid-induced low in 2020-21. But it predicts a decline in autogas demand to 499,000t by 2025-26.

FSU

The landmark Russian petrochemical merger could affect LPG railcar flows from Taif's Nizhnekamskneftekhim and Kazanorgsintez assets, writes Artem Sviriyukov

Sibur-Taif merger may change freight flows

Russian petrochemical and LPG firm Sibur's planned takeover of independent refiner Taif's petrochemicals businesses may alter freight flows.

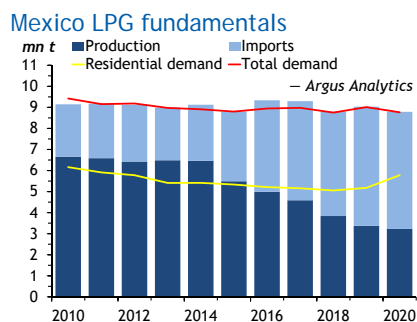
Rail transport companies with existing Sibur contracts are expected to start receiving additional supplies once it takes control of Taif's Nizhnekamskneftekhim and Kazanorgsintez assets, market participants say. Leading LPG railcar operator SG-Trans carries Sibur's LPG from the plants. Sibur is in the process of [selling its share](#) in LPG transport joint venture NKHTK, which leases 4,800 railcars from SG-Trans and owns a fleet of around 4,000.

Nizhnekamskneftekhim mainly produces synthetic rubber and plastics, but it also yields LPG and some refinery by-products. LPG exports from the facility dropped by 45pc on the year to 46,400t in 2020, while domestic deliveries fell by 17pc to 128,000t, according to rail freight forwarders. Kazanorgsintez is Russia's largest source of polyethylene, accounting for about 40pc of the country's total output. Both plants use ethane and LPG as feedstock.

Sibur should complete its planned [acquisition of Taif's petrochemical assets](#) this year, subject to regulatory approval. Sibur will take a controlling 50pc plus one share stake, while Taif's owners will receive a 15pc stake in Sibur. Taif's 160,000 b/d Nizhnekamsk refinery is not included in the deal.

MEXICO

Black market operators are becoming increasingly sophisticated and throttling growth in the domestic LPG market, writes Sergio Meana



Fuel theft threatens Mexican LPG market growth

Mexico's growing LPG theft could curb post-pandemic growth in the legal domestic market if the government fails to tackle the problem.

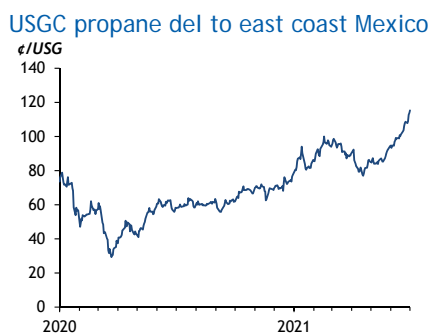
LPG is widely used in Mexico as a household cooking fuel because of limited natural gas grid infrastructure, with residential demand standing at more than 5mn t in 2019 out of a total of just over 9mn t, Argus data show. Mexico's energy ministry, Sener, forecasts LPG demand to grow by 8pc to 316,000 b/d (9.9mn t/yr) between 2020 and 2032. But growth, albeit small at around 0.6pc/yr under Sener's forecast, could diminish further or even reverse if challenges are not addressed, LPG distributors association ADG says. Growth of 0.6pc-1pc/yr is achievable when matched against population growth, ADG president Luis Landero says. "But the market is not really growing, mainly because it is being captured by the black market. If anything, the [legal] market might even decrease."

Mexico's population grew by around 1.2pc/yr to 126mn over 2010-20. But market participants say LPG market growth is stalling as a result of fuel theft. Black market operators are gaining the upper hand by selling LPG at half the average retail price of legal distributors, while disguising their operations as legal through shell companies. "They use rebranded tank trucks, names that seem legitimate, and they even have good customer service at times," a local LPG retailer says. Illegal operators are also known to use extortion, threatening customers with violence to buy a minimum amount of LPG and bribing authorities.

State-owned oil firm Pemex identified more than 2,290 illegal taps on LPG pipelines in the first quarter, up by nearly a third from a year earlier. President Andres Manuel Lopez Obrador's government has made tackling fuel theft a priority since his election in 2018, but successful efforts have largely centred on gasoline and diesel, leading criminals to target LPG pipelines instead. Pemex in 2020 estimated that up to 30bn pesos (\$1.5bn) worth of LPG was stolen from its pipelines.

MEXICO

Monopolistic practices are being investigated and price controls that were lifted in 2017 could be reintroduced, writes Jens Gould



President considers capping LPG prices

Mexican president Andres Manuel Lopez Obrador is considering capping domestic LPG prices if they continue to rise at a faster rate than inflation.

"The techocrats will not like it... [but] if it is necessary, we will set a maximum price," the president said on 2 July. Preventing energy prices from rising above inflation was one of Lopez Obrador's campaign promises. Private-sector companies have long handled LPG retail distribution in Mexico, unlike gasoline and diesel markets that were controlled by state-owned oil firm Pemex until 2014.

LPG prices have risen in Mexico City as "there are monopolies that control gas", the president said. "We are going to confront this issue." Propane prices have risen sharply in the US, where the majority of Mexico's imports arrive from. Domestic LPG retail prices increased by 34pc on the year to 12.89 pesos/litre (\$2.44/USG) in June, having reached a record high of Ps15.56/l in the last week of the month, according to Mexico's consumer watchdog Profeco.

Mexico's energy ministry last month asked competition watchdog Cofece to investigate monopolistic practices in the LPG industry that would warrant the reintroduction of price controls lifted in January 2017. But profit margins have not risen and in some cases have fallen for LPG distributors, retailers say, given their dependence on rising US Mont Belvieu prices.

IN BRIEF

Asia-Pacific

China Gas' LPG sales rise by 11pc

China's largest LPG importer and distributor, China Gas, has reported an 11pc year-on-year increase in its domestic LPG sales to 4.25mn t in fiscal year 2020-21 ending in March. This lifted the firm's LPG division profit to 208.94mn Hong Kong dollars (\$26.9mn). Wholesale sales rose by 29pc to 3.52mn t, outweighing a drop in retail sales of 34pc to 722,300t. China Gas' overall profit rose by 5.9pc on the year to HK\$18.1bn. The company hopes to benefit from further integration between its industrial, trade and retail operations and its development of [smart LPG micro-grid networks](#). China Gas also aims to maximise profits from its entire LPG value chain, where it owns terminals, storage facilities, vessels, a fleet of vehicles and distribution networks. The company signed up more than 2mn residential users and entered into agreements with cities and counties covering more than 25mn households for its micro-grid system, it said in late June.

Japan cuts LPG imports from Kuwait

Japan's LPG imports fell by 3.1pc on the month to 749,400t in May, finance ministry data show. The country continues to cut purchases from Kuwait, with receipts dropping by 75pc to 19,360t. This outweighed more imports from the US and Australia, which rose by 13pc to 511,100t and 62pc to 79,870t, respectively. Arrivals from Qatar rose to 20,970t from zero in January-April, while none came from Saudi Arabia and the UAE for the third and fifth consecutive months, respectively.

China's Anqing Taiheng to start PDH unit

Chinese petrochemical firm Anqing Taiheng aims to start up a 300,000 t/yr propane dehydrogenation (PDH) unit in east China's Anhui province in second-half July. Propane feedstock will come from the 180,000 b/d Anqing refinery and imports.

Middle East

Saudi Aramco raises July LPG prices

State-controlled Saudi Aramco has raised its July propane contract price (CP) by \$90/t and butane by \$95/t from May to \$620/t apiece on firmer oil prices and strength in the global LPG market. Aramco is expected to cut its LPG exports this month, with around four very large gas carriers and some midsize vessels cancelled or deferred, market participants say. Production issues in Saudi Arabia and firm domestic petrochemical demand curbed second-half June loading. The tighter supply outlook has pushed premiums to swaps to \$3/t for evenly split propane-butane cargoes in late July as of 22 June.

Iraq gets \$360mn to cut flaring

Iraq's Shell-led Basrah Gas (BGC) consortium will receive a \$360mn loan from the World Bank's finance arm IFC to reduce associated gas flaring in southern Iraq and raise dry gas and natural gas liquids (NGL) output.

BGC says the five-year loan will partially fund construction of the Basrah Natural Gas Liquids (BNGL) extraction plant, which will boost gas processing capacity by 40pc to 1.4bn ft³/d (14.4bn m³/yr). The yield of NGLs from the facility is not disclosed.

The Iraqi government in May approved investment of [\\$3bn over the next five years](#) to boost domestic gas processing over two phases, to eventually reach 2.4bn ft³/d. The \$3bn covers 17 gas compressors, four treatment plants and a storage and export terminal for condensate and LPG. No details on LPG yields from the investment have been provided but it could produce enough to cover 80pc of Iraq's LPG demand, which stood at around 1.5mn t in 2019, *Argus* data show.

BGC, which includes state-owned South Gas, Shell and Japan's Mitsubishi, processes associated gas from oil production at the Rumaila, West Qurna 1 and Zubair fields. It captures around 60pc of the available natural gas and meets about 80pc of Iraq's LPG cooking demand.

BGC is also developing its export capabilities and supporting Iraq's efforts to diversify its revenue streams by becoming a net exporter of LPG and condensate, it says.

Europe and Mediterranean

Turkish LPG sales slide during lockdown

Turkish LPG sales fell by 11pc on the month to 285,600t in April, energy regulator EPDK data show, after the country imposed new restrictions in the first two weeks of the Islamic fasting month of Ramadan in response to spiking Covid-19 cases. But sales were a fifth higher than a year earlier during the first wave of Covid-19. Demand fell by 2pc on the year to 1.12mn t in January-April. Turkey imported 224,900t in April, down by 13pc on the month and by 3pc on the year.

Norwegian NGL output slumps

Norway's natural gas liquids (NGL) production dropped by over a quarter on the year and by half on the month to 960,000m³ (505,000t) in May, preliminary data from the Norwegian Petroleum Directorate (NPD) show. Output was 4.5pc under the NPD's forecast for the month of 1.01mn m³. The drop in production coincides with maintenance at Norway's Karsto gas processing plant and LPG terminal from mid-May until late June. The NPD forecasts NGL output to rise by nearly a third on the month to 1.25mn m³ in June.

IN BRIEF

SHV Energy to develop UK rDME plant

Netherlands-based LPG distributor SHV Energy and UK-based biofuels technology company Kew Technology are to jointly develop a renewable dimethyl ether (rDME) production plant in the UK. The companies aim to build a 50,000 t/yr facility that will use municipal solid waste as feedstock. The Circular Fuels joint venture is the first project of its kind, SHV says, with a goal to develop further plants in Europe and North America. The full waste-to-rDME facility in the West Midlands, central England, will be operational from early 2022, SHV says. The project follows SHV and peer UGI's announcement in May to spend \$1bn on [developing rDME production](#).

Shipping

Exmar receives new LPG-fuelled VLGC

Belgian LPG shipowner Exmar has taken delivery of the 88,000m³ dual-fuel very large gas carrier (VLGC) *Flanders Innovation* from China's Jiangnan Shipyard. A sister vessel from Jiangnan is due to arrive in late August. *Flanders Innovation* was the first newbuild LPG-fuelled VLGC ordered and is the most efficient and largest dual-fuel carrier in the world, Exmar says. The two vessels' dual-fuel engines will reduce CO₂ emissions by 38pc compared with the minimum requirements for VLGCs from the IMO, Exmar says. At least six dual-fuel VLGCs owned by BW LPG are in operation but these had engines retrofitted. *Flanders Innovation* and the sister vessel will enter a five-year time charter with Norway's state-controlled Equinor.

West Africa

Nigeria's seaborne LPG arrivals slide

Nigeria's seaborne LPG imports and arrivals from the Bonny Island LNG plant fell by a quarter on the year and more than a third on the month to 66,680t in May, domestic pricing regulator the PPPRA says. But the country's total intake of around 410,800t in January-May was an increase of 3pc from a year earlier. Most of the fall in May was from imports, with around 80pc arriving from Bonny Island.

Latin America

Pemex's LPG imports decline in May

Mexican state-owned Pemex's LPG production from gas processing rose by 5,000 b/d on the month to 86,000 b/d (229,800t) in May, while ethane output fell by 1,000 b/d to 57,000 b/d. Overall LPG output from refining and gas processing rose by less than 5,000 b/d to 94,000 b/d. Pemex imported 42,400 b/d of LPG in May, down from 72,800 b/d in April.

North America

Brookfield lifts bid for Inter Pipeline

Toronto-based investor Brookfield Infrastructure has increased its previous all-cash bid to acquire Canadian midstream firm Inter Pipeline (IPL) by C\$0.90/share to approximately C\$20.65/share (\$6.70/share).

IPL recommends shareholders accept peer [Pembina Pipeline's C\\$8.3bn bid](#) and reject Brookfield's hostile takeover attempt, saying the former is a better strategic fit that will reap long-term rewards. Shareholders on 29 July will vote on the Pembina merger.

Pembina made an all-share bid, under which IPL shareholders will receive 0.5 shares of Pembina for each IPL share, valued at C\$19.45. Brookfield's hostile bid of 74pc cash and 26pc shares is valued at C\$19.75/share.

Pembina and IPL have appealed to the Alberta Securities Commission to remedy disclosure issues and coercive tactics by Brookfield. "It is critically important that all shareholders involved... be given transparency and a fair, unencumbered process," Pembina president Mick Dilger says.

"Brookfield is pushing the same offer that has essentially been repackaged three times while trying to unfairly influence a democratic process to have that inferior transaction accepted," he says.

US ethane exports continue to climb

US ethane exports rose to another monthly record in April, surpassing the previous high in March, supported by expanded export infrastructure. Shipments rose by 9pc on the month and 45pc on the year to 406,000 b/d (688,100t) in April, EIA data show. India was the top US ethane importer in April, receiving 171,000 b/d. US midstream firm Energy Transfer opened its 180,000 b/d [Orbit ethane export terminal](#) in Nederland, Texas, in early 2021 — the third such facility in the US. The country's upstream output also rose to a new high in April as higher prices encouraged recovery from the natural gas stream. Output was up by 11pc on the month and 24pc on the year to 2.2mn b/d.

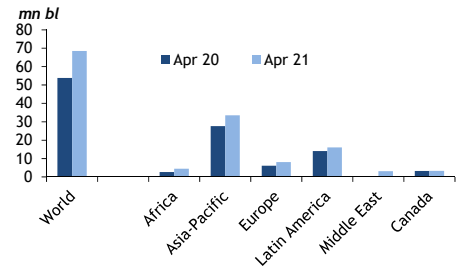
Canadian LPG output, stocks increase

LPG production in Alberta in western Canada rose in May, supported by higher oil prices and recovering demand. Propane output rose by 18pc on the year and 5.5pc from April to 173,000 b/d (418,500t), data from the Alberta Energy Regulator show. Butane production was relatively flat compared with April at 118,000 b/d (327,800t) but 22pc higher than in May 2020. The gains helped lift western Canadian stocks, which increased by 11pc on the month and 7.9pc on the year to 7.76mn bl (669,000t) in May.

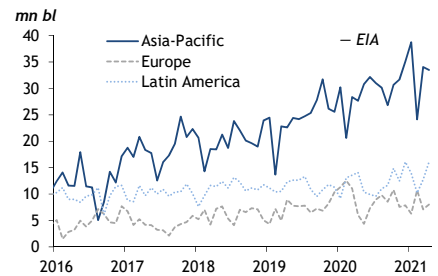
TRADE FLOWS: US EXPORTS

US LPG exports				'000 bl
Exports by country	Apr	Feb-Apr	Feb-Apr 20	±%
China	7,354	20,303	7,629	166.1
Japan	10,605	30,778	40,878	-24.7
Singapore	622	2,670	0	-
South Korea	4,672	9,648	10,456	-7.7
Other Asia-Pacific	10,254	28,298	17,722	59.7
Total Asia-Pacific	33,507	91,697	76,685	19.6
Ghana	0	0	373	-100.0
Morocco	1,567	3,722	1,940	91.9
Ivory Coast	229	229	1,307	-82.5
Other Africa	2,711	8,967	6,004	49.4
Total Africa	4,507	12,918	9,624	34.2
Belgium	399	1,455	1,083	34.3
France	1,116	3,815	2,088	82.7
Netherlands	2,539	6,574	6,150	6.9
Portugal	246	3,788	2,069	83.1
Spain	0	961	4,495	-78.6
UK	1,174	2,786	5,552	-49.8
Other Europe	2,559	5,540	8,186	-32.3
Total Europe	8,033	24,919	29,623	-15.9
Aruba	15	41	5	720.0
Brazil	3,376	5,867	7,631	-23.1
Chile	2,796	4,313	2,754	56.6
Dominican Rep.	850	2,482	3,623	-31.5
Ecuador	2,206	3,800	3,146	20.8
Guatemala	414	1,214	1,118	8.6
Honduras	299	1,430	1,354	5.6
Mexico	3,629	14,724	15,888	-7.3
Panama	105	238	496	-52.0
Peru	144	939	861	9.1
Other Latin America	2,225	3,945	3,821	3.2
Total Latin America	16,059	38,993	40,697	-4.2
Turkey	3,122	4,621	1,298	256.0
Other Middle East	0	5,150	0	-
Total Middle East	3,122	9,771	1,298	652.8
Canada	3,304	8,909	10,975	-18.8
Total exports	68,532	187,207	168,902	10.8

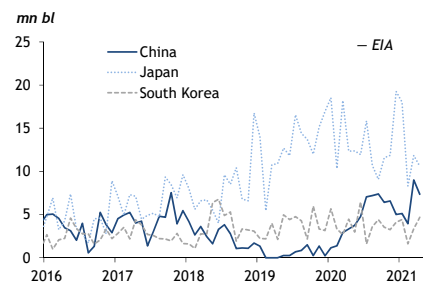
US exports: year-on-year change



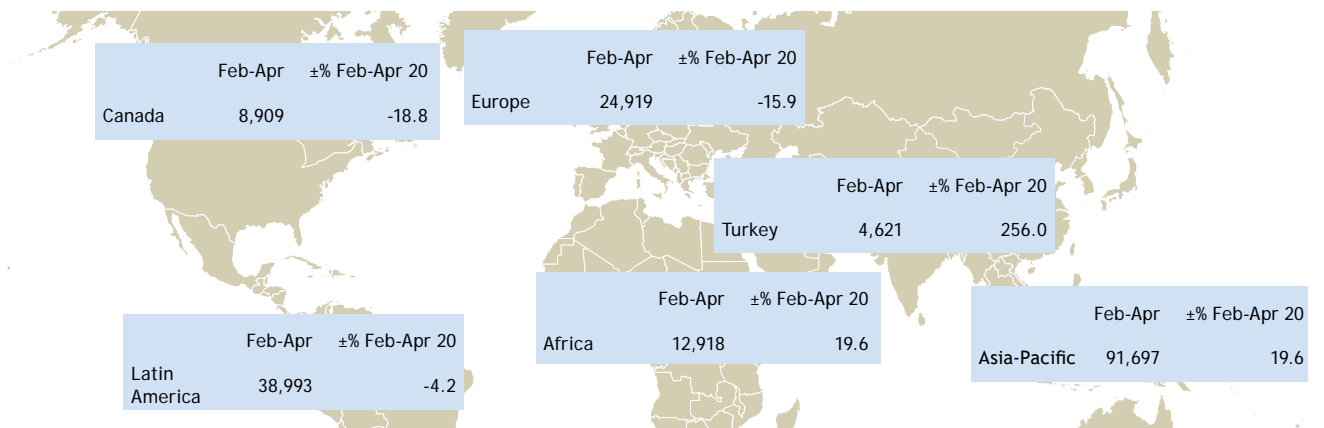
US exports: key regions



US exports: key Asia-Pacific countries

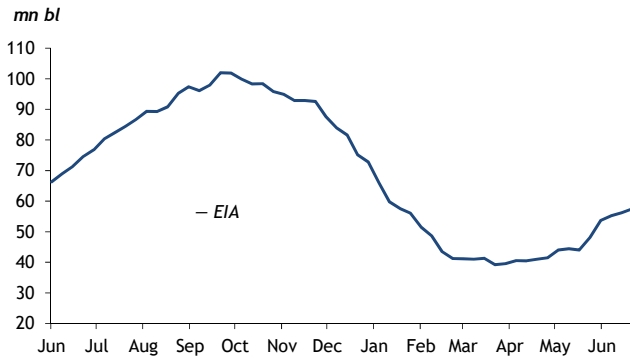


US exports by region

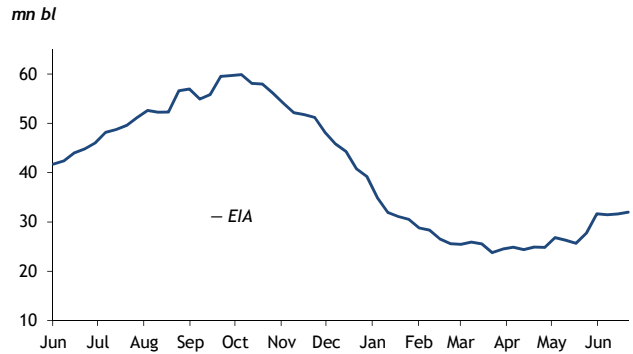


INVENTORIES: US

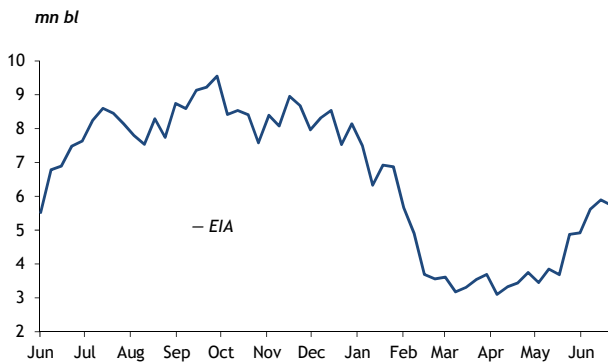
Total US weekly propane stocks



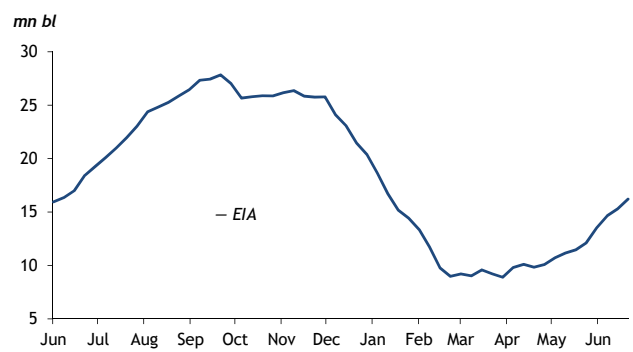
US Gulf coast stocks



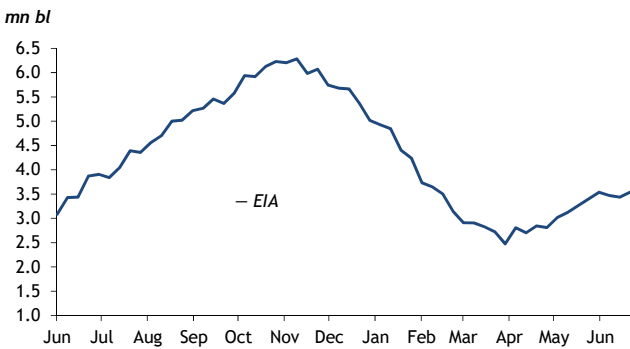
US east coast stocks



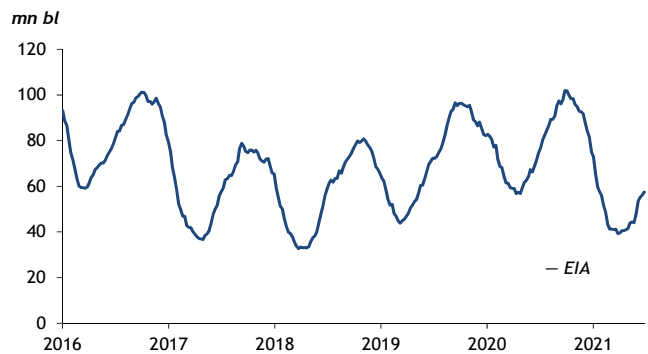
US midcontinent stocks



US west coast stocks



US stocks 5-year view



MARKET ANALYSIS

■ US propane inventories rose by 1.2mn bl to 57.5mn bl (4.64mn t) over the week to 25 June, data from government agency the EIA show.

■ The increase matched market participants' expectations but still left stocks 23pc down on the year and 17pc below the five-year average.

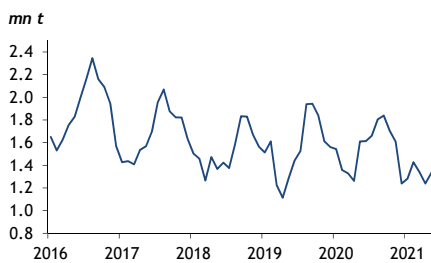
■ US midcontinent inventories made the largest gain, rising by 926,000 bl to 16.2mn bl. US Gulf coast inventories climbed by 362,000 bl to 32mn bl, while east coast inventories fell by 152,000 bl to 5.7mn bl.

■ Propane output rose by 13,000 b/d to 2.26mn b/d. Exports grew by 31,000 b/d to 1.2mn b/d.

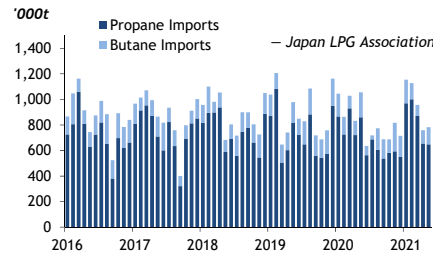
TRADE FLOWS: JAPAN, SOUTH KOREA

Japanese LPG imports							'000t
Imports by country	May	Mar-May	Mar-May 20	21/20 ±%	Mar-May 19	21/19 ±%	2021
Saudi Arabia	0.0	0.0	39.7	-100.0	0.0	-	91.3
Qatar	21.0	21.0	46.7	-55.1	65.4	-67.9	21.0
Kuwait	19.4	224.0	130.8	71.3	187.5	19.5	334.5
UAE	0.0	0.0	26.9	-100.0	222.7	-100.0	0.0
Australia	79.9	164.7	227.2	-27.5	146.3	12.5	322.4
US	511.1	1,670.3	1,962.9	-14.9	1,634.2	2.2	3,276.3
Others	118.1	396.3	192.1	106.3	20.9	1,794.8	627.3
Total imports	749.4	2,476.3	2,626.2	-5.7	2,277.1	8.7	4,672.7
Imports by product							
Propane	666.9	2,282.5	2,419.6	-5.7	2,000.1	14.1	4,213.2
Butane	82.6	193.8	206.6	-6.2	277.0	-30.0	459.5

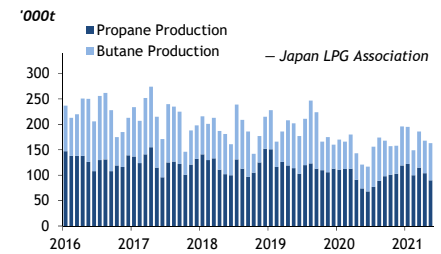
Japan: LPG stocks



Japan: LPG imports

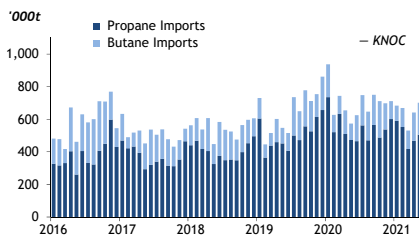


Japan: LPG production

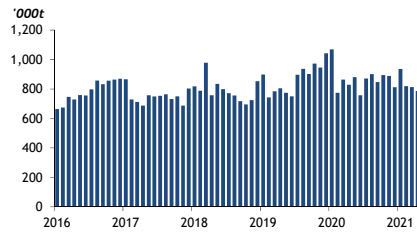


South Korean LPG imports							'000t
Imports by country	May	Mar-May	Mar-May 20	21/20 ±%	Mar-May 19	21/19 ±%	2021
US	615	1,693	1,893	-10.6	1,498	13.0	2,945
UAE	34	71	0	-	52	36.5	71
Qatar	0	24	0	-	47	-48.9	77
Australia	0	0	0	-	0	-	0
Nigeria	0	0	0	-	0	-	3
Kuwait	0	0	0	-	14	-100.0	2
Saudi Arabia	46	46	0	-	34	-100.0	46
Others	2	5	16	-68.8	5	35.3	6
Total imports	697	1,839	1,909	-3.7	1,650	11.5	3,150
Imports by product							
Propane	503	1,385	1,610	-14.0	1,338	3.5	2,524
Butane	194	453	299	51.5	309	46.6	625

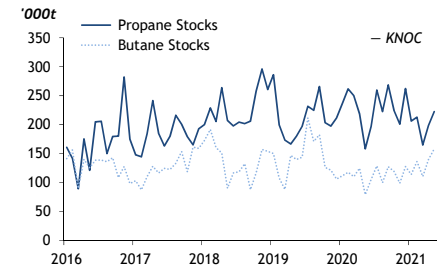
South Korea: LPG imports



South Korea: LPG consumption



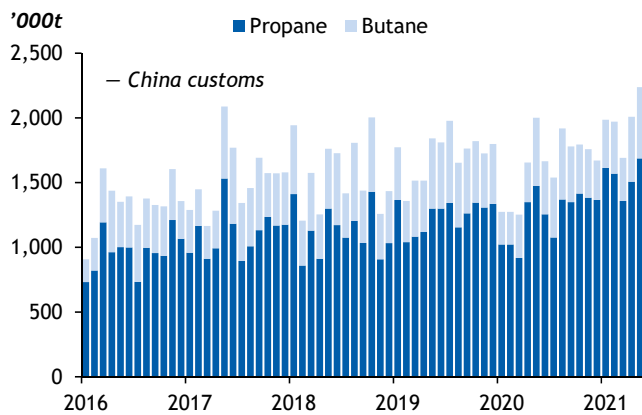
South Korea: LPG stocks



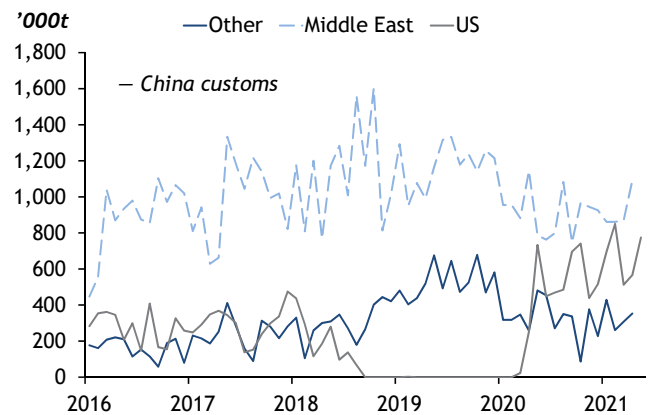
TRADE FLOWS: CHINA

China LPG imports							'000t
Imports by country	May	Mar-May	Mar-May 20	21/20 ±%	Mar-May 19	21/19 ±%	2021
US	774	1,852	1,008	83.7	0	-	3,397
UAE	317	762	821	-7.2	915	-16.7	1,463
Qatar	349	885	599	47.7	786	12.6	1,284
Saudi Arabia	10	111	437	-74.6	523	-78.8	202
Kuwait	162	413	328	25.9	528	-21.8	550
Australia	44	305	262	16.4	223	36.8	534
Others	584	1,612	1,453	10.9	1,890	-14.7	2,467
Total imports	2,240	5,940	4,908	21.0	4,865	22.1	9,897
Imports by product							
Propane	1,687	4,552	3,741	21.7	3,499	30.1	7,734
Butane	550	1,384	1,167	18.6	1,368	1.2	2,158

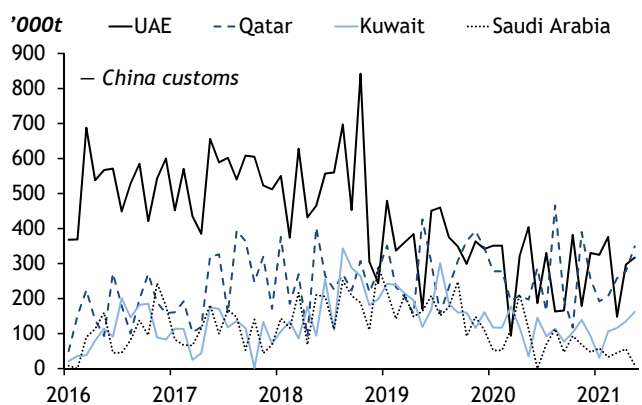
China LPG imports by product



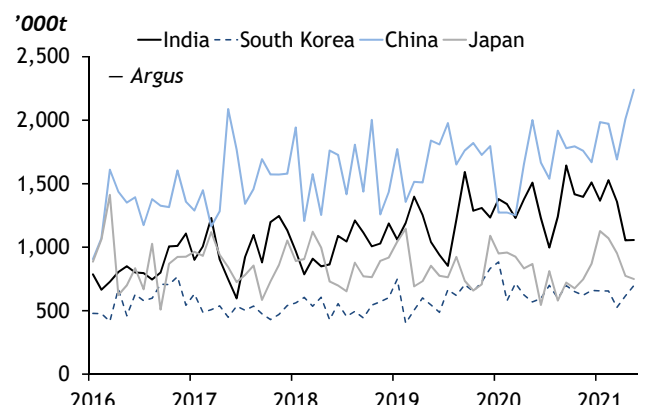
China LPG imports by origin



China LPG imports from Middle East

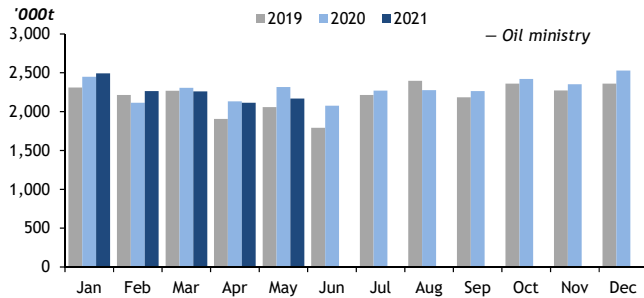


Key Asia-Pacific LPG importers

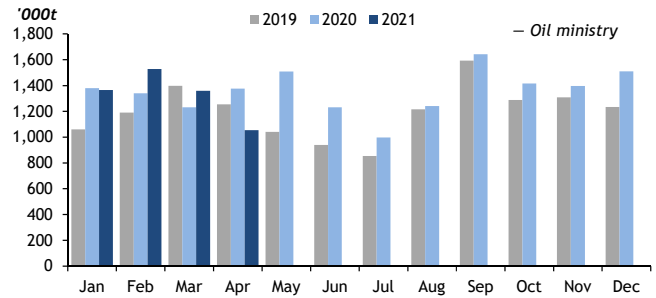


STATISTICS: ASIA

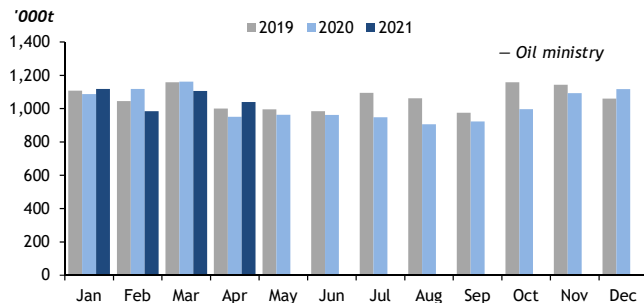
India: LPG demand



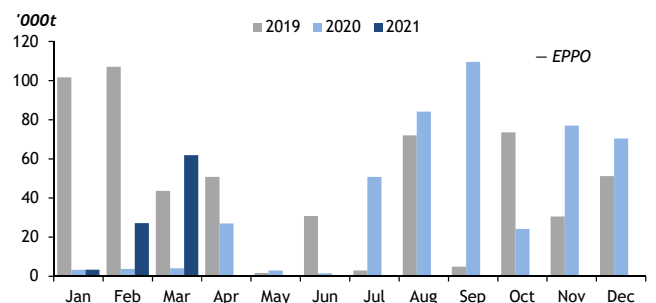
India: LPG imports



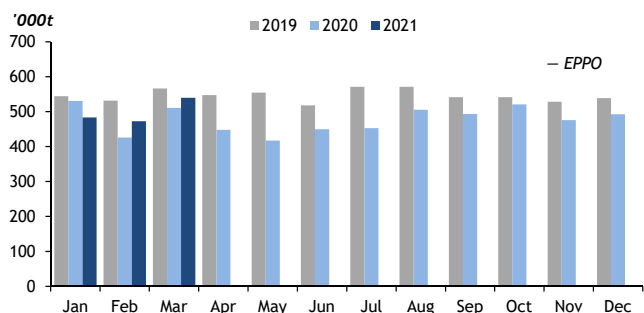
India: LPG production



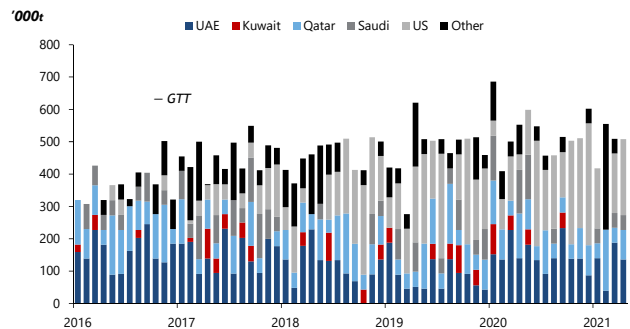
Thailand: LPG imports



Thailand: LPG consumption



Indonesia: LPG imports origin



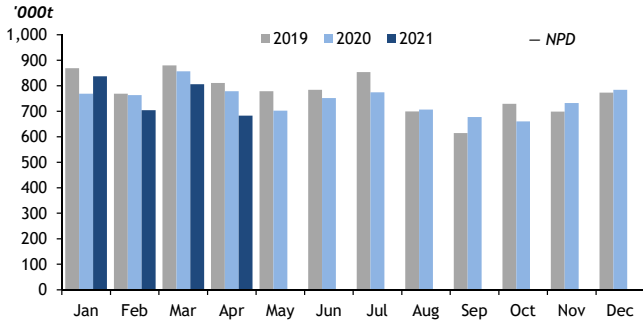
MARKET ANALYSIS

Japan's LPG sales fell by 0.6pc on the year to 1.2mn t in April, data from the Japan LP Gas Association show. Household and commercial sales fell by 5.8pc to 615,600t in April. Industrial sales dropped by 1.3pc to 219,300t, while city gas and autogas sales both fell by 13pc to 94,500t and 30,200t, respectively. But petrochemical sector sales rose by 34pc to 205,100t on higher cracker utilisation.

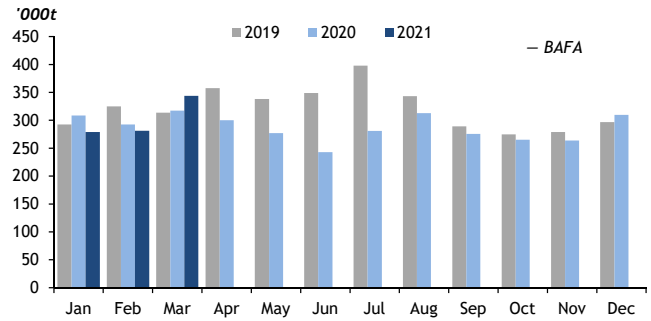
South Korea's LPG stocks rose by 13pc on the month to 380,600t in May, data from state-owned KNOC show, as increased imports and domestic output outweighed higher consumption. Imports increased by 9.4pc to 702,000t, while production at refineries rose by 13pc to 247,500t. Demand grew by 14pc to 897,00t, largely on firmer demand from the autogas and industrial sectors.

STATISTICS: EUROPE

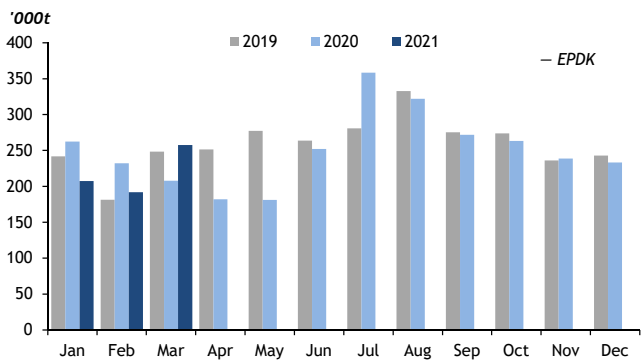
Norway: NGL production



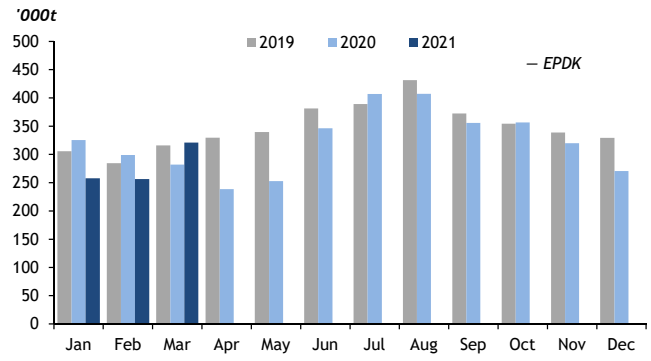
Germany: inland LPG deliveries



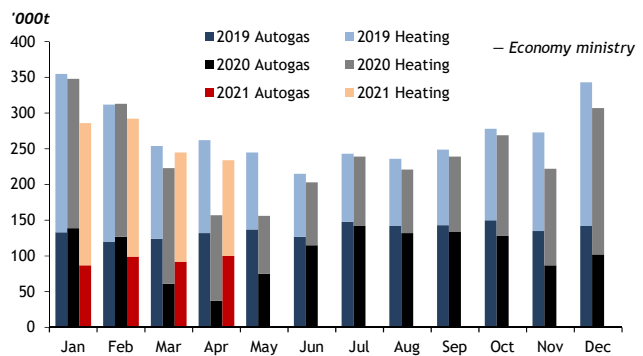
Turkey: LPG imports



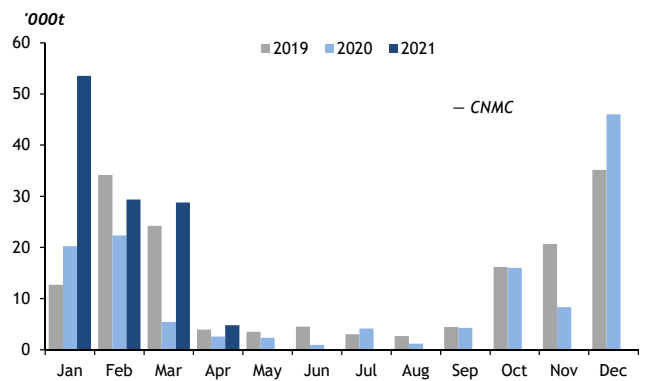
Turkey: LPG consumption



Italy: LPG transport and heating consumption



Spain: LPG imports



EUROPEAN PROPANE

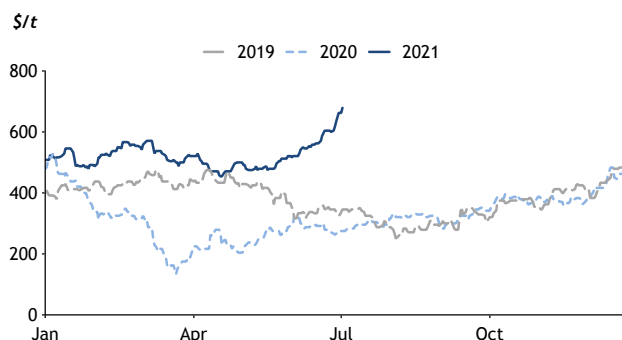
Large cargo propane prices rose by \$86.75/t to \$632.50/t cif Amsterdam-Rotterdam-Antwerp (ARA) between 11 June and 1 July – their highest since October 2018. Surging US prices and strong demand in Asia-Pacific closed the spot arbitrage to northwest Europe, while local supply was trimmed by the ramp-up from maintenance of the Karsto facility in Norway and reduced refinery supplies.

Strong demand from petrochemical producers continued despite the propane discount to naphtha contracting to \$42.75/t from \$80.75/t in mid-June. Physical premiums to front-month swaps rose as high as \$13.75/t on 22 June from discounts early in the month.

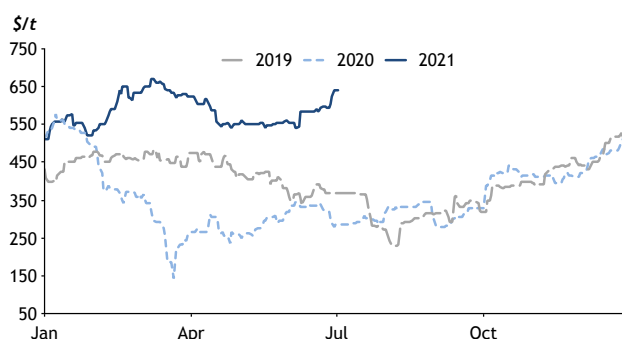
Coaster spot activity was largely muted, but the premium to large cargoes slid to \$4.50/t on 1 July from \$19/t in mid-June as inland demand weakened. But outright prices still rose by \$72.25/t for both fob and cif coasters to \$637/t and \$680/t, respectively. Barge prices in the ARA hub fell below large cargoes, to \$625/t, as stockbuilding demand faded.

Mediterranean demand was low but fob Lavera prices rose by \$46.25/t to \$540/t. Algeria's Sonatrach lifted its July propane price by \$100/t to \$595/t.

Propane cif NWE cargoes large



Propane fob ARA barge



EUROPEAN BUTANE

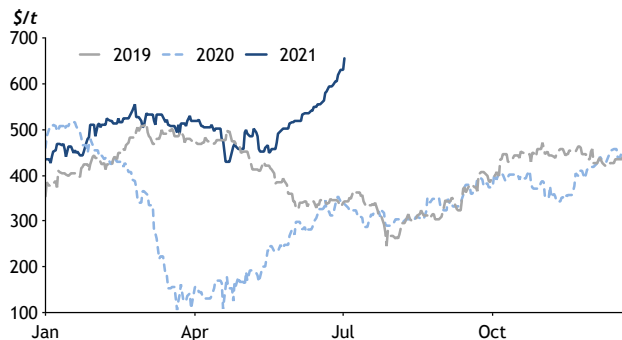
Large cargo butane prices rose by \$83/t to \$618.75/t cif Amsterdam-Rotterdam-Antwerp (ARA) between 11 June and 1 July, with the price relative to naphtha increasing to 91.6pc – the highest for early July since 2013. Petrochemical producers with crackers that can accommodate butane maximised its use, picking up limited local supply, while US imports were impeded by a closed arbitrage.

Fob coaster prices rose by \$92.50/t to \$597.50/t on higher bidding from Mediterranean buyers and thin availability on all cargo sizes. Cif prices climbed by \$68/t to \$601/t, mostly on naphtha gains. Limited local availability lifted the ratio to naphtha by three percentage points to 89pc.

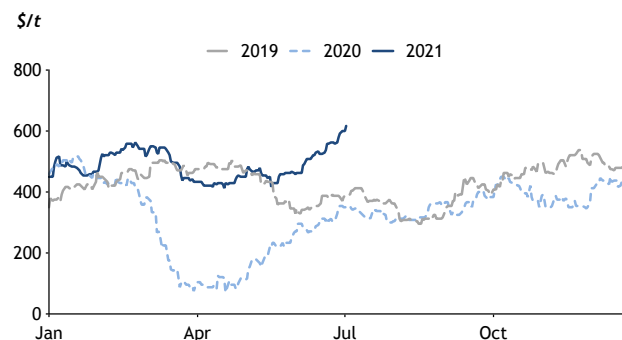
Extra ARA barge demand from ethylene crackers and gasoline blenders helped lift delivered prices to 90pc of naphtha from 84pc, pushing outright prices up by \$84.25/t to \$592.75/t by 1 July.

Sporadic demand in the Mediterranean kept fob Lavera prices largely steady, rising to \$593/t on 1 July from \$587/t on 11 June. Algeria's Sonatrach raised its July butane price by \$113/t to \$605/t.

Butane cif NWE cargoes large



Butane fob ARA barge



FSU LPG

■ Russian LPG producers raised their prices as a result of stronger autogas demand, seasonal maintenance at condensate stabilisation and gas processing plants and in line with rising international LPG and oil prices.

■ Daf Brest propane-butane mix prices on the Poland-Belarus border rose to \$510.50/t by 2 July from \$448/t on 10 June because of a decline in supply and tracking price gains in northwest Europe.

■ A total of 27,000t of daf Brest propane-butane mix changed hands on the Argus Open Markets (AOM) trading platform between 11 June and 2 July, compared with 21,600t between 28 May and 10 June.

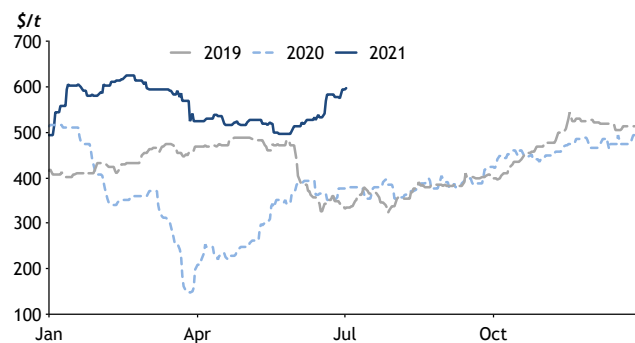
■ Daf Brest propane prices increased to \$593/t by 2 July from \$526.50/t on 10 June, in line with firming northwest European assessments. A total of 400t was sold on the AOM between 10 June and 1 July compared with 1,900t between 28 May and 10 June.

■ Propane-butane mix prices at the Russia-Ukraine and Belarus-Ukraine borders increased to \$522.50/t from \$499.50/t as a result of stronger demand. No propane-butane mix deals to Ukraine were struck on AOM between 10 June and 1 July.

■ The price of propane-butane mix at the Uzbekistan-Tajikistan border rose to \$452.50/t daf Bekabad from \$420/t, in line with higher seasonal demand and lower availability of LPG from Kazakhstan.

■ Propane-butane mix prices on the Ukraine-Romania border increased to \$392.50/t from \$352.50/t in line with price gains on international markets.

Propane Argus daf Brest



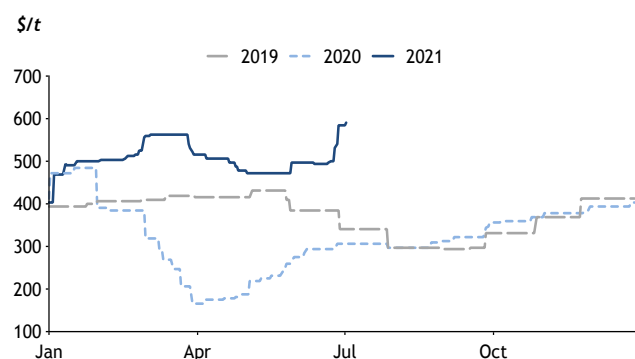
BLACK SEA LPG

■ Fob Black Sea assessments for propane, butane and propane-butane mix all increased after Algeria's Sonatrach raised its July propane price by \$100/t to \$595/t and its butane price by \$113/t to \$605/t.

■ Propane-butane mix and propane prices at Black Sea ports increased by \$87.50/t to \$585/t, and butane prices rose by \$95/t to \$590/t.

■ Total LPG loading at Russian Black Sea and Sea of Azov ports increased to 51,000t between 10 June and 2 July compared with 25,600t between 28 May and 9 June.

Propane Argus fob Black Sea



ASIA PROPANE

- The propane Argus Far East Index (AFEI) rose by \$79.50/t to \$690.50/t between 11 June and 1 July. Premiums to front-month paper also edged up to \$4.50/t as buyers continued to outnumber sellers for first-half August deliveries.
- The jump in propane prices came after state-controlled Saudi Aramco raised its July propane contract price (CP) by \$90/t to \$620/t.
- A number of buyers bid for 45,000t evenly split propane-butane cargoes loading in July and August ahead of Aramco's CP announcement. A major bid for a 44,000t evenly split cargo loading on 13-15 July at \$632/t.
- Buying interest was further stoked by very large gas carrier spot freight rates stabilising at \$47/t on the Ras Tanura-Chiba route.

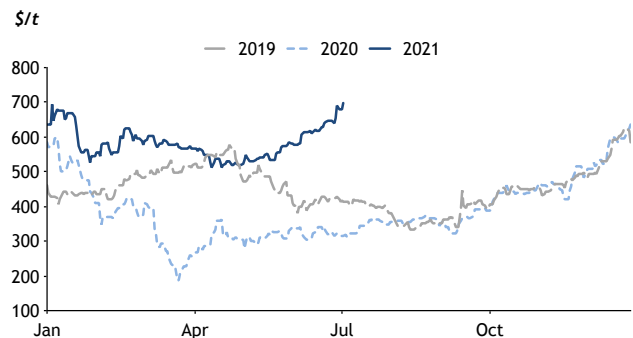
ASIA BUTANE

- The butane Argus Far East Index (AFEI) rose by \$72.50/t to \$690.50/t, the same as propane, on strong demand for evenly split propane-butane cargoes from southeast Asia.
- State-controlled Saudi Aramco lifted its July butane contract price (CP) to \$620/t, at parity to the propane CP compared with a discount of \$5/t in June.
- Indonesia's Pertamina bid for a 45,000t evenly split cargo for delivery on 27-31 August to Arun, Tanjung Uban, Kalbut or Tanjung Sekong. Taiwan's CPC bought a 22,000t evenly split shipment for 22-31 July delivery to Shen-Ao and/or Kaohsiung at a \$45/t premium to July CP paper.
- Petrochemical sector demand was limited by August butane rising to \$6/t above equivalent cif naphtha values.

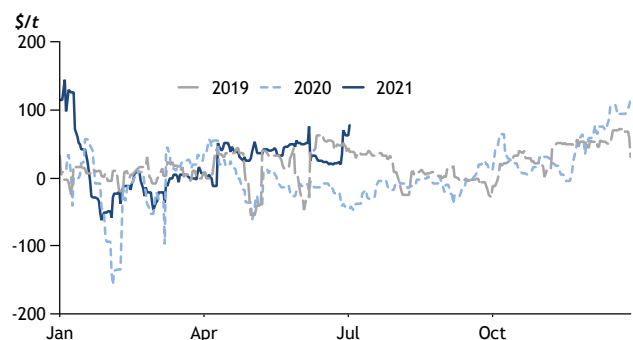
ASIA PRESSURISED

- Selling indications for July-loading cargoes from terminals in south China were \$43/t above July CP paper, underpinned by higher import costs.
- Spot demand from north Vietnam was limited owing to adequate term supplies. Offers for July delivery cargoes came in at July CP plus \$90/t basis cfr Haiphong.
- July-August CP backwardation hovered at \$30/t, which is likely to have boosted prompt demand.

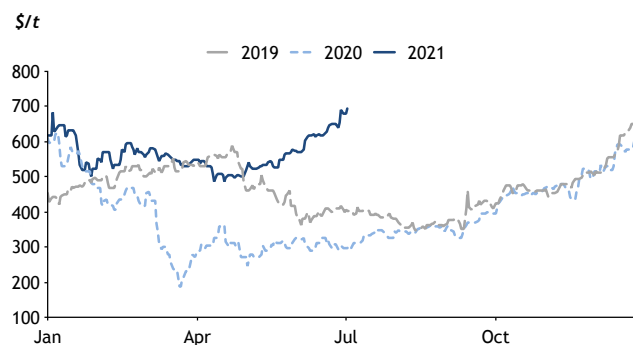
Propane Argus Far East index



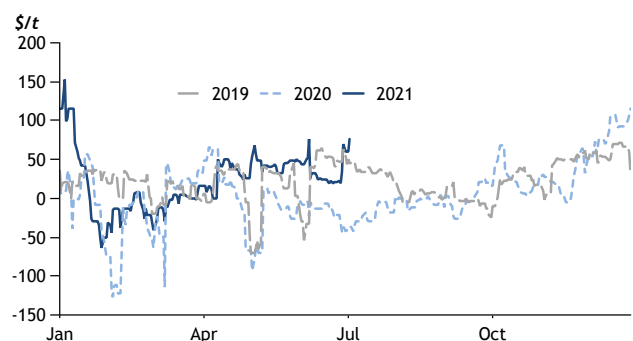
Propane cfr Japan premium to CP



Butane Argus Far East Index



Butane cfr Japan premium to CP



AMERICAS PROPANE

■ Mont Belvieu LST propane prices on the US Gulf coast reached a seven-year intra-day high of 115.375¢/USG (\$693/t) on 1 July before closing at 112.25¢/USG, compared with 94.875¢/USG on 15 June. Steady export demand, and domestic propane inventories nearly a quarter lower than a year earlier provided extra support for prices lifted by rising crude values.

■ LST propane's value relative to Nymex WTI crude rose to 62.6pc on 1 July from 55.3pc on 15 June.

■ Mont Belvieu EPC propane prices increased by 17.625¢/USG to 112.5¢/USG.

■ Conway prices in the US midcontinent rose to 109.75¢/USG from 93.50¢/USG in mid-June on concerns over inventories and flat production. Conway propane stood at a narrower 1.125¢/USG discount relative to the LST cavern at Mont Belvieu in the second half of June.

■ Edmonton in-well propane prices in western Canada firmed to a 19¢/USG discount to Conway prices on steady seaborne exports and local demand.

AMERICAS ETHANE

■ Mont Belvieu EPC ethane prices rose by 2.6¢/USG to 30.75¢/USG (\$229/t) by 1 July from mid-June. Low inventories and higher natural gas prices drove the gains.

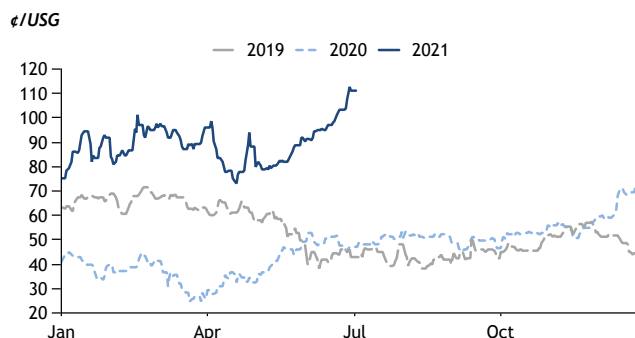
AMERICAS BUTANE

■ Mont Belvieu EPC butane prices on the US Gulf coast rose to 125.875¢/USG (\$570/t) on 1 July from around 110¢/USG in mid-June on strong export demand. US butane exports reached a record high in April, the latest EIA data show (see p6). The Mont Belvieu value relative to Nymex WTI crude rose to 70.3pc from 64pc in late June.

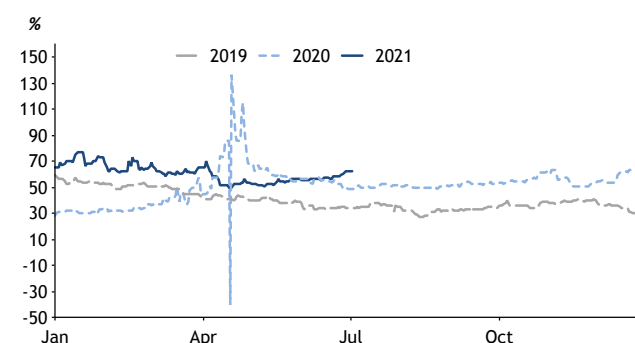
■ Conway butane prices in the US midcontinent increased by more than 15¢/USG to 120.625¢/USG by 1 July from mid-June, in line with firming Mont Belvieu prices and tight availability in the regional market. But Conway values weakened to a 5¢/USG discount to the EPC cavern at Mont Belvieu.

■ Edmonton butane prices in western Canada firmed to 54pc of the calendar month average of WTI crude in late June discussions, following a small build in inventories and steady provincial demand.

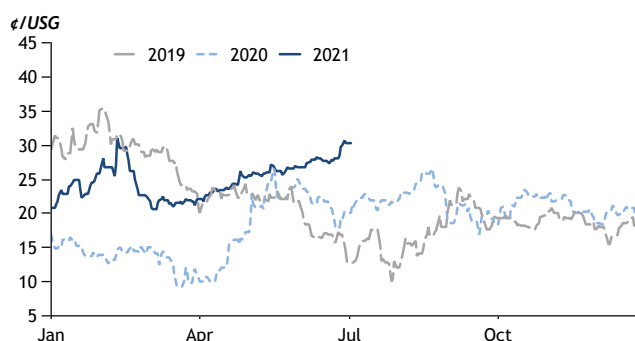
Propane Mont Belvieu non-LST



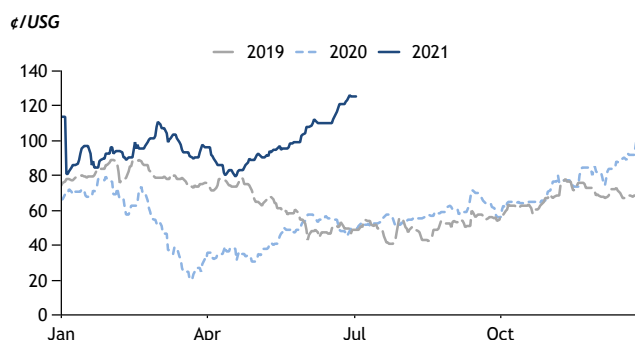
Propane Mont Belvieu LST % to Nymex WTI



Ethane Mont Belvieu



Butane Mont Belvieu non LST



NGL ECONOMICS/SHIPPING

Ethylene plant total variable cash cost*					
	2 Jun	9 Jun	16 Jun	23 Jun	30 Jun
Purity ethane	10.73	11.16	11.43	11.37	12.28
Propane	10.63	13.45	13.53	17.51	20.16
N-Butane	6.37	12.50	10.84	14.81	17.10
Light naphtha	7.30	11.19	12.05	15.71	14.45
Gasoil	21.48	24.30	22.66	26.62	22.47

*at Mont Belvieu, Texas

— Argus

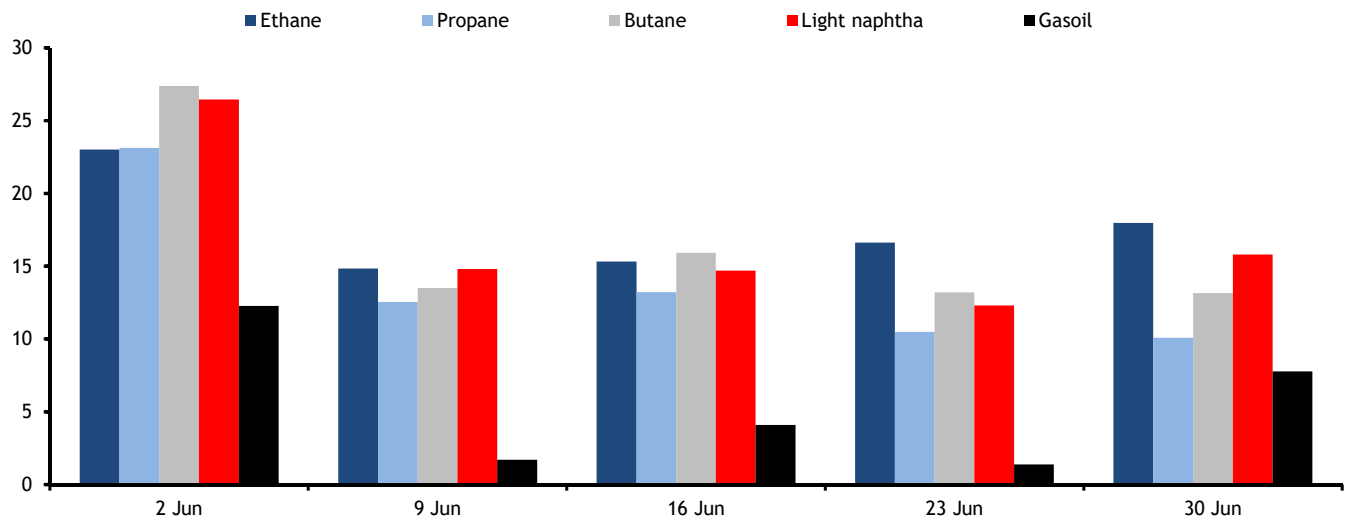
Ethylene plant gross margins* (see graph below)					
	2 Jun	9 Jun	16 Jun	23 Jun	30 Jun
Ethane	23.02	14.84	15.32	16.63	17.97
Propane	23.12	12.55	13.22	10.49	10.09
Butane	27.38	13.50	15.91	13.19	13.15
Light naphtha	26.45	14.81	14.70	12.29	15.80
Gasoil	12.27	1.70	4.09	1.38	7.78

*at Mont Belvieu, Texas

— Argus

US Ethylene plant gross margins (Mont Belvieu, Texas)

€/lb of ethylene



Shipping

■ Belgian LPG shipowner Exmar has taken delivery of the 88,000m³ dual-fuel very large gas carrier (VLGC) *Flanders Innovation* from Jiangnan Shipyard in China. Exmar is due to take delivery of a sister vessel in late August. *Flanders Innovation* was the first newbuild dual-fuel LPG carrier ordered.

■ Chinese-Japanese joint venture Yangzi Mitsui Shipbuilding has won a contract to build three dual-fuel LPG/ammonia carriers for German shipowner Hartmann Reederei. The 40,000m³ ships are expected to be delivered in 2023.

Shipping rates

■ Very large gas carrier (VLGC) rates on the Ras Tanura-Chiba route shed \$1/t from 10 June to \$46/t by 1 July. Reduced Mideast Gulf supplies and closing US arbitrages continued to weigh on rates with Panama Canal delays and stable demand for US exports not enough to compensate.

■ Coaster rates in northwest Europe edged up to \$47/t from \$44/t on the Tees-ARA route. Increasing refinery runs have lifted demand for vessels, supporting values in the mid-to-high \$40s/t since mid-May.

Shipping rates			\$/t
Spot			
44,000t	Mideast Gulf/Japan	▼	46.00
1,800t	Tees/ARA	▲	47.00
1,800t	Tees/Lisbon	▲	92.00

— Argus/Gibsons

Shipping rates			\$/calendar month
12-month time charter			
82,000m ³ +		▼	975,000
38,000m ³		◀ ▶	810,000
35,000m ³		◀ ▶	690,000
3,500m ³ pressurised (west)		◀ ▶	230,000
3,500m ³ pressurised (east)		◀ ▶	215,000

PROPANE													
	Jul 20	Aug	Sep	Oct	Nov	Dec	Jan 21	Feb	Mar	Apr	May	Jun	Jul
Middle East \$/t													
Saudi Arabia	360.00	365.00	365.00	375.00	430.00	450.00	550.00	605.00	625.00	560.00	495.00	530.00	620.00
Kuwait	360.00	365.00	365.00	375.00	430.00	450.00	550.00	605.00	625.00	560.00	495.00	530.00	620.00
Mediterranean \$/t													
Algeria (Sonatrach)	260.00	285.00	308.00	335.00	360.00	375.00	485.00	495.00	545.00	500.00	465.00	495.00	595.00
Spot prices \$/t													
Large cargo cif ARA*	300.25	327.50	345.75	372.00	382.00	462.50	493.50	558.00	488.00	469.50	497.50	605.00	na
Large cargo cif Lavera	282.02	313.69	304.70	359.34	354.90	441.67	520.31	548.13	538.55	485.90	482.12	556.73	na
Large cargo Japan cfr	339.23	361.05	358.21	432.89	463.18	554.49	622.34	584.63	581.32	534.77	545.53	614.76	na
Large cargo east China cfr	339.23	361.05	358.21	432.89	463.18	554.49	622.34	584.63	581.32	534.77	545.53	614.76	na
Large cargo south China cfr	339.23	361.05	358.21	432.89	463.18	554.49	622.34	584.63	581.32	534.77	545.53	614.76	na
Large cargo Far East index*	361.50	372.50	390.25	435.75	479.75	615.50	564.75	608.50	570.00	520.00	554.50	648.25	na
Asia spot premiums to CP \$/t													
Mideast Gulf	-33.86	-29.75	-15.64	-2.54	-10.43	-25.00	-24.45	-24.42	-29.39	-11.33	-8.84	2.14	na
South China (pressurised)	69.76	67.30	69.14	68.48	71.33	76.86	75.95	70.21	70.00	70.00	68.53	70.41	na
East China (refrigerated)	-21.73	-5.45	-7.71	45.07	28.66	92.72	61.14	-22.00	-30.73	-9.51	44.95	67.81	na
South China (refrigerated)	-21.73	-5.45	-7.71	45.07	28.66	92.72	61.14	-22.00	-30.73	-9.51	44.95	67.81	na
Taiwan	-25.58	-6.00	-6.34	23.39	22.23	79.67	32.44	-20.63	-9.42	27.20	41.32	33.95	na
Japan	-25.58	-6.00	-6.34	23.39	22.23	79.67	32.44	-20.63	-9.42	27.20	41.32	33.95	na
Mont Belvieu ¢/USG													
LST	49.20	50.59	49.35	52.02	54.65	64.92	87.43	91.53	92.35	81.96	82.48	96.99	na
Non-LST	49.43	51.97	49.28	51.78	54.73	64.56	86.68	89.60	92.06	83.65	81.96	96.75	na
Europe \$/t													
Coasters fob NWE	304.81	334.16	330.65	385.06	391.21	444.20	527.38	600.75	578.13	529.52	503.79	575.44	na
Barges fob NWE	291.40	332.48	305.18	407.71	411.19	458.55	550.10	591.30	644.17	579.50	551.47	575.68	na
Coasters fob Med	335.51	338.07	362.77	432.32	421.10	457.14	547.00	606.00	599.70	476.20	436.86	497.38	na
Ethane ¢/USG													
	Jun 20	Jul	Aug	Sep	Oct	Nov	Dec	Jan 21	Feb	Mar	Apr	May	Jun
Mont Belvieu	21.91	21.62	24.15	19.95	21.55	21.62	19.98	23.59	26.55	21.68	23.74	26.11	27.78
Naphtha \$/t													
	Jun 20	Jul	Aug	Sep	Oct	Nov	Dec	Jan 21	Feb	Mar	Apr	May	Jun
Cargoes cif NWE	342.32	382.33	381.56	366.95	375.35	370.06	432.63	500.98	556.31	574.28	559.29	594.26	635.18
Cargoes c+f Japan	360.08	392.68	400.47	397.09	391.19	384.32	448.98	513.53	564.81	593.32	571.20	602.19	643.90
BUTANE													
	Jul 20	Aug	Sep	Oct	Nov	Dec	Jan 21	Feb	Mar	Apr	May	Jun	Jul
Middle East \$/t													
Saudi Arabia	340.00	345.00	355.00	380.00	440.00	460.00	530.00	585.00	595.00	530.00	475.00	525.00	620.00
Kuwait	340.00	345.00	355.00	380.00	440.00	460.00	530.00	585.00	595.00	530.00	475.00	525.00	620.00
Mediterranean \$/t													
Algeria (Sonatrach)	340.00	310.00	340.00	380.00	400.00	420.00	490.00	510.00	535.00	510.00	460.00	492.00	605.00
Spot prices \$/t													
Large cargo cif ARA*	308.00	351.00	394.00	402.50	403.00	449.50	451.75	553.50	492.00	430.00	490.50	594.25	na
Large cargo cif Lavera	342.92	337.38	375.43	411.88	390.45	454.80	458.95	521.06	513.34	468.91	457.83	529.98	na
Large cargo Japan cfr	324.42	349.80	362.11	442.84	473.32	549.62	591.14	564.21	553.40	513.73	539.11	613.45	na
Large cargo east China cfr	324.42	349.80	362.11	442.84	473.32	549.62	591.14	564.21	553.40	513.73	539.11	613.45	na
Large cargo south China cfr	324.42	349.80	362.11	442.84	473.32	549.62	591.14	564.21	553.40	513.73	539.11	613.45	na
Large cargo Far East index*	342.50	361.50	395.25	447.75	488.75	600.50	540.75	580.50	534.00	497.00	548.50	650.25	na
Asia spot premiums to CP \$/t													
Mideast Gulf	-33.86	-29.75	-15.64	-2.54	-10.43	-25.00	-24.45	-24.42	-29.39	-11.33	-9.00	2.14	na
India cfr	-21.58	-4.35	-1.48	43.43	23.94	77.62	46.29	-26.11	-32.90	-7.85	50.63	65.40	na
South China (pressurised)	71.19	67.40	69.14	68.32	71.29	76.86	75.95	70.21	70.00	70.00	68.53	70.41	na
East China (refrigerated)	-16.58	0.65	3.52	48.43	28.94	82.62	51.29	-21.58	-27.90	-2.85	55.63	70.40	na
South China (refrigerated)	-16.58	0.65	3.52	48.43	28.94	82.62	51.29	-21.58	-27.90	-2.85	55.63	70.40	na
Taiwan	-23.87	-4.15	-2.48	24.21	21.66	78.31	31.19	-16.68	-7.34	30.54	44.90	33.40	na
Japan	-23.87	-4.15	-2.48	24.21	21.66	78.31	31.19	-16.68	-7.34	30.54	44.90	33.40	na
Mont Belvieu ¢/USG													
LST	46.89	50.34	55.77	61.36	66.26	64.62	87.64	97.78	101.74	82.13	87.38	105.59	na
Non-LST	52.88	56.49	63.96	63.45	76.70	88.33	88.24	95.17	98.91	85.61	94.46	112.29	na
Europe \$/t													
Coasters fob NWE	362.05	320.07	354.88	406.02	374.49	445.33	491.71	543.48	517.35	440.43	447.20	522.93	na
Barges fob NWE	333.54	322.53	359.27	412.01	366.30	421.19	478.53	534.29	503.88	429.44	457.76	517.05	na
Coasters fob Med	345.83	289.23	377.96	451.16	416.64	531.76	510.50	554.00	581.19	475.40	433.86	552.23	na

*as of Apr 2019 spot price on 25th or nearest working day to 25th of the month

— all prices from Argus International LPG

DATA

Chinese domestic prices												Yuan/t	
	Jun 20	Jul	Aug	Sep	Oct	Nov	Dec	Jan 21	Feb	Mar	Apr	May	Jun
East China terminal													
Ningbo ex terminal	2,710	2,838	2,960	2,893	3,317	3,396	3,927	4,520	4,110	3,999	4,266	4,103	4,196
Wenzhou ex terminal	2,712	2,830	2,955	2,889	3,325	3,418	3,925	4,483	4,108	3,983	4,267	4,106	4,196
Taicang ex terminal	2,805	2,934	3,075	2,996	3,353	3,463	3,935	4,544	4,115	4,109	4,340	4,159	4,255
Shanghai ex terminal	2,720	2,819	2,940	2,857	3,262	3,361	3,851	4,468	4,005	3,909	4,206	4,099	4,112
Zhangjiagang ex terminal	2,808	2,934	3,075	2,993	3,352	3,463	3,925	4,539	4,112	4,109	4,340	4,159	4,255
Fujian ex terminal	2,653	2,866	2,879	2,870	3,513	3,468	3,897	4,431	4,122	4,140	4,286	4,120	4,222
East China refinery													
Shanghai ex refinery	2,562	2,699	2,915	2,738	3,170	3,151	3,564	4,118	3,502	3,613	4,040	3,985	3,947
Zhenhai ex refinery	2,740	2,871	2,939	2,798	3,211	3,216	3,686	4,241	3,827	3,767	4,186	4,058	4,096
Yangzi ex refinery	2,676	2,880	3,048	2,940	3,197	3,199	3,656	4,295	3,703	3,882	4,276	4,178	4,156
Fujian ex refinery	2,594	2,760	2,837	2,824	3,482	3,324	3,788	4,142	3,695	3,984	4,208	4,022	4,064
Gaoqiao ex refinery	2,558	2,696	2,920	2,738	3,192	3,132	3,561	4,116	3,486	3,575	4,010	3,956	3,946
South China terminal													
Zhuhai ex terminal	2,606	2,838	2,936	2,838	3,488	3,441	3,933	4,515	3,978	4,318	4,257	3,958	4,264
Shenzhen ex terminal	2,639	2,868	2,962	2,884	3,507	3,443	3,934	4,538	4,021	4,315	4,268	3,982	4,265
Raoping ex terminal	2,652	2,860	2,937	2,888	3,528	3,423	3,915	4,477	3,997	4,324	4,351	4,017	4,219
Nansha ex terminal	2,652	2,860	2,937	2,888	3,528	3,423	3,915	4,477	3,997	4,324	4,351	4,017	4,219
Yangjiang ex terminal	2,580	2,825	2,958	2,831	3,494	3,394	3,924	4,418	3,977	4,287	4,172	3,908	4,305
South China refinery													
Maoming ex refinery	2,512	2,807	2,954	2,804	3,366	3,350	3,742	4,364	3,840	4,254	4,010	3,773	4,161
Guangzhou ex refinery	2,568	2,814	2,923	2,850	3,419	3,394	3,834	4,464	3,908	4,231	4,156	3,838	4,049
Northeast China refinery													
Daqing ex refinery	2,580	2,782	3,392	3,107	3,100	3,132	3,616	4,130	3,652	3,855	4,208	4,181	3,920
Dalian ex refinery	2,416	2,520	3,082	2,743	2,748	2,775	3,289	3,630	3,235	3,658	4,070	3,980	3,734
Northwest China refinery													
Urumqi ex refinery	1,380	1,789	2,112	2,261	2,531	2,546	2,611	2,915	2,468	2,849	3,565	3,625	3,232
Inland China refinery													
Lanzhou ex refinery	na	na	na	na	na	na	na	na	na	na	na	na	na
Yan-An ex refinery	2,347	2,744	2,986	2,853	2,961	3,048	3,371	3,817	3,517	3,697	4,199	4,179	3,986

– all prices from Argus International LPG



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