



**The government's financial package to tackle rising fuel costs does not measure up to other fuel support offered, writes Waldemar Jaszczyk**



## Poland to provide grant to LPG-fuelled homes

The Polish government has launched a new financial support package for households with LPG boilers to help cover surging fuel costs this winter. But the payment will not be enough, according to the domestic industry.

Warsaw will provide about 150,000 homes that use LPG with a one-time payment of 500 zlotys (\$110) under the scheme. It forms part of a larger 2bn zloty proposal to shield the most vulnerable citizens from surging heating fuel costs this winter, announced by climate minister Anna Moskwa on 5 August. The highest incentive of 3,000 zlotys will be given to the roughly 300,000 homes using wood pellets, while 122,000 that have heating oil boilers will receive 2,000 zlotys, and more than 500,000 that use wood logs will get 1,000 zlotys.

The package will help household budgets and increase the sense of energy and social security, Moskwa said. Parliament is due to pass the scheme in September.

The payment is “incomparably insignificant” to the support for other fuels, Polish LPG association POGP director general Andrzej Olechowski says. The wholesale price of propane in Poland has risen by over 30pc to 3 zlotys/litre in the past 12 months, having risen by 46pc in 2021, LPG distributor ChemLine says. Heating demand represents around 15pc of Poland’s LPG demand of 2.4mn t/yr, according to POGP, but it is an essential fuel for rural off-grid homes.

LPG had largely been ignored by the government in its attempts to rein in inflation and spiralling heating costs, firstly through value-added tax (VAT) cuts on natural gas and electricity to 0pc and 5pc, respectively, from 22pc in early 2022. LPG’s VAT rate was unchanged, as the governing majority in parliament voted down a proposal for similar cuts.

The government opposed lowering VAT on LPG, firstly because the market is considered too fragmented and privately owned, with retail prices set independently by distributors. There was no guarantee the cut would convince sellers to jointly lower prices, Poland’s climate ministry says. Lowering VAT on LPG is also incompatible with EU law, specifically Article 102 of the VAT Directive that only allows reductions on certain products and services, the finance ministry says.

LPG was also initially left out of plans to provide subsidies to households for heating fuels. Coal was left out of the VAT cut plans but the government proposed a one-time grant of 3,000 zlotys for each home in July, amounting to a total of 11.5bn zlotys. The issue was picked up by the opposition-controlled senate, which recently introduced a bill to extend zero VAT cuts to LPG, wood pellets and heating oil for the fourth quarter, accusing the government of discriminating against homes that do not use natural gas. Under these plans, LPG distributors would need to inform customers of the zero tax rates.

Poland’s senate had also proposed amending the government’s coal subsidy package to extend the one-off payment of 3,000 zlotys to all heating fuels. But the ruling majority in parliament voted against the measure on 4 August.

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## EDITORIAL

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### *The ‘final text’ of an agreement that would restore Iran’s nuclear deal must first be acceptable to Washington and Tehran*

#### Deal or no deal

Iran is closing in on a new nuclear deal that would signal an end to US and EU sanctions on the country, potentially reinvigorating its upstream sector and boosting LPG output and exports in the process. But all parties still need to finalise an agreement more than one year in the offing.

The EU submitted what it calls the “final text” of the agreement to salvage the 2015 nuclear deal, or the Joint Comprehensive Plan of Action (JCPOA), earlier this month after four days of negotiations in Vienna. But Washington and Tehran were still negotiating the finer points by mid-August, with Iran’s foreign minister Hossein Amir-Abdollahian saying the talks will need to continue until the US can satisfy Tehran’s concerns.

“Behind every technical issue and every paragraph lies a political decision that needs to be taken in the capitals,” EU foreign affairs representative Josep Borrell says. “If these answers are positive, then we can sign this deal.” The EU, which has been mediating the talks since they began in April 2021, has not given any concrete timeframe for this to happen. But, with patience among all involved wearing thin, it is likely to be a matter of weeks rather than months.

US sanctions at one point cut Iran’s crude exports to below 500,000 b/d, from 2.4mn b/d previously. Argus estimates that Iran exported about 750,000 b/d over the past three months. Restoring the deal in its original form could add 1.3mn b/d of Iranian crude within six to nine months of implementation. But even if nuclear-related sanctions are lifted, the US government will not relax restrictions on foreign banks and companies doing business with sanctioned Iranian companies, the US State Department’s Iran envoy Rob Malley said on 13 August.

Iran’s LPG production fell by a fifth on the year to 9.2mn t in 2018, Argus Analytics data show, after former US president Donald Trump pulled the country out of the JCPOA and reimposed sanctions on the country. Output reached a five-year low of 7.8mn t in 2020. Iran’s LPG exports followed a similar path, dropping by 28pc to under 6mn t in 2018, and a five-year low of 4.8mn t in 2020. But production and exports have been rising since, and a recent jump in shipments to Asia-Pacific in July means they could exceed their highest since 2017 by the end of this year (see p6). Unshackling the upstream sector, in particular the South Pars gas development, could send both significantly higher over the next 20 years – to 13.6mn t/yr and 10.7mn t/yr, respectively, by 2040, Argus Consulting forecasts.

The signs so far for a new deal are positive, but securing Iranian consent has been made thornier by Trump effectively tearing up the last JCPOA. Many of Tehran’s objections have centred on seeking guarantees that a future US administration does not renege on the deal. It also wants the US to remove Iran’s Revolutionary Guard from its list of terrorist organisations. But it now appears to have softened on both demands.

#### Deeds not words

Iran is again insisting that UN nuclear watchdog the IAEA close a probe into past nuclear activities at three undeclared sites where traces of nuclear material have been found. The IAEA is not a signatory to the JCPOA and not part of the Vienna talks, making this a delicate point that will require a solution outside the new deal. “Good words” from Iran will not be enough to satisfy IAEA inspectors, director general Rafael Grossi says.

Should Tehran strike a deal with the IAEA, allowing inspectors back into Iran’s nuclear sites, this text could prove to be, as the EU hopes, the finishing touch that delivers what looked almost impossible just weeks ago. But if Iran’s leadership sees such access as a step too far, this text could go the way of its predecessors, and prepare the grounds for little more than yet another round of talks.

## Q&amp;A

## Canada LPG outlook still strong despite challenges

*Canada's LPG industry continues to expand as production rises from the country's vast upstream resources, and demand grows as a petrochemical feedstock and for seaborne exports to northeast Asia. The Calgary-based Canadian Propane Association (CPA) represents more than 400 companies working in the sector. Yulia Golub spoke with its chief executive Shannon Watt:*

### Can you provide details for some of the initiatives the CPA is working on?

The CPA recently contracted a study on the life cycle greenhouse gas (GHG) emissions intensity of Canadian propane. It shows that the carbon intensity (CI) of propane is 72g CO<sub>2</sub>e/MJ, which is lower than the federal government's Clean Fuel Regulations of 75g CO<sub>2</sub>e/MJ. The study is an important step on the propane industry's path to net-zero. As technology continues to advance and the value chain becomes more efficient, the already low-emission profile of propane will continue to decrease. The CPA is using this study in its advocacy work with governments to ensure policy makers are aware of the important role propane can and should play in a low-carbon future.

The CPA is also working with governments to help Canadians deal with the high cost of energy. Nearly one in 10 Canadians spend more than 10pc of their income on heating or cooling their home. On top of that, inflation has hit a 40-year high. The CPA is working with governments across Canada to develop an energy rebate programme [for propane and other home heating sources] to help Canadians avoid significant price spikes for their home heating this winter.

### What are the major challenges facing Canada's LPG industry today?

There is a big push to electrify everything. But no single energy source can solve every environmental challenge – all forms of clean energy are going to be needed. The electricity grid is not ready, nor is the technology needed to make it reliable. We only have to look at the recent power outages experienced in Germany and California. And choosing electricity is not always the most environmental option – six of Canada's 13 provinces and territories have a higher CI for electricity than propane. In Alberta, its power output is three times more harmful than propane because some of its electricity is still produced from coal.

We can reach our intended outcome of clean energy in a pragmatic and reliable way. Canadians who live in rural and remote areas of the country need ready access to reliable, clean and affordable energy. With its nationwide infrastructure, propane provides that energy equity. The CPA is committed to the development of regulations that will result in meaningful emission reductions while providing practical and cost-efficient low-emissions pathways.

### Will LPG play a role in Canada's longer-term energy transition?

Through innovation, such as renewable propane made from a mix of waste residues and sustainably sourced materials, the industry can continue to serve the energy needs of future generations. Propane can also be blended with renewable dimethyl ether (rDME), which is being [commercially produced and blended with propane in California](#). Both renewable propane and an rDME blend can be "drop-in" replacements for appliances that use propane. Through the advent of renewable propane and rDME, the industry expects to see further reductions in CI. According to the US' Propane Education and Research Council, a blend of 30pc propane, 50pc renewable propane and 20pc rDME can lower propane's CI to zero g/MJ by 2030, with the ability to achieve a negative CI by 2050.

Propane also has unmatched distribution infrastructure, and its contribution towards improving indoor and outdoor air quality is recognised by governments



**'There is a big push to electrify everything. But no single energy source can solve every environmental challenge – all forms of clean energy are needed'**

## Q&A

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around the world. Including it in the transition to a lower-carbon economy will immediately reduce GHGs while providing economic benefits and jobs in Canada.

**Given Canadian LPG exports from the Pacific coast have been steadily increasing in recent years, is there a concern that output will fail to keep up with demand?** Canada's propane production is expected to increase in the coming years. And the outlook for the industry is favourable, with multiple factors supporting strong growth. These include improving prospects for petrochemicals, the recent export terminal projects for overseas markets, and evolving environmental considerations and power generation needs in Canada's remote communities.

Canada has always been a net exporter of propane, whether it be to overseas markets or to the US. Nothing has changed. Canada competes in a global marketplace, as it does for almost all products and we are proud of our ability to export Canadian propane and displace other high-emission energy sources.

*'Value-added and economic diversification policies are key drivers behind the growing demand for propane as a petrochemical feedstock'*

**Do you expect rail exports to the US to decline as waterborne shipments rise?**

The US has historically been the primary market for Canadian propane, but most of the additional export demand is expected to come from new markets rather than the US. Canadian seaborne shipments began at about 8,420 b/d in May 2019, when **AltaGas** launched its **Ridley Island terminal**. By May 2020, the flow had swelled sixfold to 51,200 b/d. In 2020, more than 68pc of propane and almost all butane exports went to the US, as more propane headed to non-US countries. Canada's propane exports are likely to compete with US supplies for Asian market share going forward, but they have some advantages over shipments from the US Gulf coast, including a shorter shipping distance to Japan and no need to transit the Panama Canal, which can cause delays.

**Petrochemical demand for propane is expected to increase when the Heartland propane dehydrogenation plant in Alberta comes on line in the coming months. How effective has the **Alberta Petrochemicals Incentive Programme** been in supporting growth in this sector?**

Value-added and economic diversification policies are key drivers behind the demand for propane as a petrochemical feedstock in the domestic market. The upstream and midstream infrastructure assets that connect Canadian producers to end-users and markets across the world, and the huge size of the country's oil and gas reserves, create an opportunity for petrochemical projects that use propane.

Companies invested more than C\$1bn [\$775mn] in Canadian petrochemical projects over 2012-17, mainly existing projects using ethane feedstock. But Alberta's recently introduced Petrochemicals Diversification Programme has encouraged multi-billion dollar investment in propane-to-polypropylene projects.

**Was the CPA involved in the **disputed closure of the Line 5 natural gas liquids (NGL) pipeline**?**

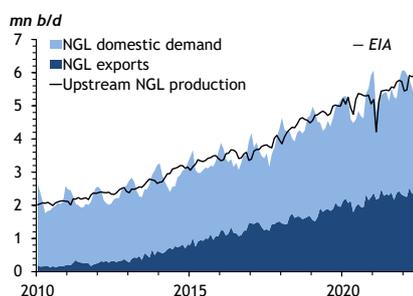
We continue to work with [operator] Enbridge to ensure no disruptions and continued service of Line 5. This includes communicating to the Canadian government and the eastern Canadian provinces of the importance of this infrastructure to millions of propane consumers. Disruption to Line 5 puts our ability to service customers in jeopardy and adds to the costs to service propane consumers in eastern Canada. Line 5 is key to the processing of NGLs into propane and butane in Sarnia, Ontario, and Sarnia is an important regional supplier – to the domestic petrochemical, refining, heating, transportation and agricultural sectors as well as exports to the US east coast and midcontinent. The Line 5 pipeline is an economic lifeline in Canada and the US, impacting millions on both sides of the border.

## US

**New NGL fractionators will accommodate growing market tightness as upstream output rises in the Permian basin, writes Abby Downing-Beaver**

US midstream operators' 2Q results		
	2Q	±% 2Q21
<b>Energy Transfer</b>		
Profit \$bn	1.60	76
NGL operating margin \$bn	1.04	6
Fractionated NGL output mn b/d	0.94	13
NGL pipeline shipments mn b/d	1.91	9
NGL exports mn b/d	1.31	10
<b>Enterprise</b>		
Profit \$bn	1.44	25
NGL operating margin \$bn	1.30	21
Fractionated NGL output mn b/d	1.30	8
NGL pipeline shipments mn b/d	3.70	9
NGL exports mn b/d	0.75	12
<b>Targa</b>		
Profit \$bn	0.60	961
NGL operating margin \$bn	0.32	11
Fractionated NGL output mn b/d	0.74	14
NGL pipeline shipments mn b/d	0.49	26
NGL exports mn b/d	0.34	1

## US NGL output, exports, demand



## Midstream firms plan Permian NGL expansion

US midstream companies plan to expand natural gas liquids (NGL) fractionation capacity over 2023-24 on expected gains in upstream output from the Permian basin, promising further growth in LPG and ethane yields.

Targa Resources and Energy Transfer plan to start up new NGL fractionators – which process raw NGLs into the main constituents of ethane, LPG and natural gasoline – within the next two years to help ease growing “tightness” in the fractionation market. The market “is tightening up, and we expect it to be tight for a while”, Targa chief executive Matthew Meloy says.

The competition for fractionation capacity was heightened recently by a fire at Oneok’s 210,000 b/d plant in Oklahoma, forcing it to shut down. Its closure led to an influx of raw NGLs heading to the Mont Belvieu hub on the Gulf coast.

Targa’s fractionation throughput rose to a record 737,200 b/d in the second quarter, up by 15pc from a year earlier. The firm is moving forward with plans to open a ninth 120,000 b/d fractionator at Mont Belvieu by the second quarter of 2024. Energy Transfer resumed construction of its eighth fractionator in Mont Belvieu in the second quarter, which is now scheduled to start up in the third quarter of 2023, it says. The project will lift the company’s total fractionation capacity at Mont Belvieu to 1.1mn b/d. Energy Transfer’s NGL fractionation throughput rose by 13pc on the year to 938,000 b/d in April-June. It expects the tightness to continue for the next six to nine months until more capacity is added.

Enterprise Products Partners is expanding its Shin Oak pipeline, which transports raw NGLs from the Permian to Mont Belvieu, to keep up with rising production in the shale basin that straddles Texas and New Mexico. Capacity will more than double to 525,000 b/d, with a completion date by the first half of 2024.

Production of raw NGLs in the Permian has grown by about 125,000 b/d so far in 2022, Enterprise vice-president Tony Chovanec says. “Those are big numbers... but I have to tell you, it’s what we’re seeing on our systems,” he says. He expects output in the basin to grow by 1mn b/d by 2027. The US produces about 5.8mn b/d of NGLs, the EIA says – an increase of more than 60pc in five years. Enterprise aims to bring the Seminole pipeline from the Permian to Mont Belvieu back into NGL service.

All three firms are expanding their natural gas processing capacities. Enterprise is to bring two gas processing plants (GPP) on line in the Delaware basin and Midland County area of the Permian, each with 40,000 b/d of NGL production capacity, by the first quarter of 2024. This will bring the firm’s total NGL extraction capacity in the Permian to 530,000 b/d.

## Running full

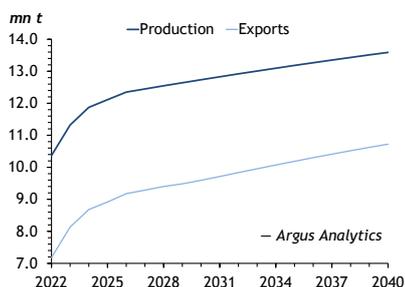
Targa has four GPPs under construction, with the 275mn ft<sup>3</sup>/d (2.8bn m<sup>3</sup>/yr) Legacy I plant in the Permian due to open late in the third quarter. The company has also added the 275mn ft<sup>3</sup>/d Greenwood GPP, in the Midland area, scheduled for completion by the fourth quarter of 2023. “We’re adding five plants across the Permian, and we’re confident they will be running full,” Targa’s president of logistics and transportation Scott Pryor says, adding that some facilities have been running over capacity. “We’re worried about when we might need more,” he adds.

Targa also completed the acquisition of Lucid Energy Delaware, a natural gas gathering and processing company, in July, and integrated its 1,050 miles (1,690km) of natural gas pipelines into its Permian operations. Energy Transfer announced this month that it will take over a similar company, Woodford Express, adding 450mn ft<sup>3</sup>/d of cryogenic gas processing and treating capacity and 200 miles of pipelines in the US midcontinent. The firm is also developing two 200mn ft<sup>3</sup>/d GPPs in the Permian, one of which is due to come on line in late 2022, and the other in the second quarter of 2023.

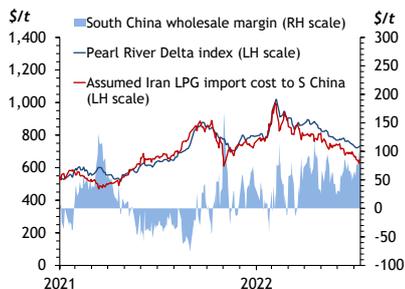
## MIDEAST GULF

**Competitive cargo prices and rising infrastructure capacity have helped to drive exports, writes Frances Goh**

### Iran LPG output, exports forecast



### South China LPG wholesale margins



## Iran exports to Asia jump on China petchem pull

Iranian LPG exports to Asia-Pacific have risen firmly this year, driven largely by more heading to China and in particular its petrochemical sector on the east coast.

Mideast Gulf LPG exports rose to about 20.6mn t in January-July, an increase of 10pc from a year earlier, data from oil analytics firm Vortexa show. Iran played a significant part in this growth. The country shipped 19 very large gas carriers (VLGCs), equivalent to about 874,000t, in July alone, market participants say. This monthly increase is probably the result of improved vessel availability, and September shipments are expected to fall back to about 550,000-600,000 t/month. It brings Iran's exports to about 4.5mn t in January-July, putting them on track to exceed 7mn t in 2022, up from 5.8mn t last year.

Iran's LPG output and exports are rising as it gets back to developing its gas processing and LPG export infrastructure capacity, with a long-awaited revival of the 2015 Iran nuclear deal that would signal the end of US sanctions expected soon. A final text on restoring the deal, known as the Joint Comprehensive Plan of Action, has been circulated by EU deputy foreign affairs secretary Enrique Mora, Russia's top envoy to the talks in Vienna, Mikhail Ulyanov, said on 8 August.

China takes most of Iran's LPG exports, at more than 85pc, according to traders, mostly on VLGCs. The remainder flows to Bangladesh, India and Pakistan in smaller vessels. About 29 VLGCs and midsize gas carriers are being employed to take Iranian LPG to Asia-Pacific buyers, shipping sources say.

The lure for buyers is the more competitive prices for Iranian cargoes, with discounts of as much as \$50-60/t compared with other Mideast Gulf-origin cargoes, although the average over the whole year is closer to \$30-40/t. The LPG had been largely heading to south China's Dongguan, Zhuhai and Chaoshan provinces, where the country's major residential, commercial and industrial markets are found, with wholesale terminals able to reap sizeable 600-750 yuan/t (\$88.40-110.50/t) profits on each cargo – including tax but excluding terminal costs. But supply has moved to the southeast provinces of Zhangzhou and Quanzhou, the eastern provinces of Jiaying and Lianyungang, and the northern provinces of Longkou and Tianjin this year, according to market participants. This is because the deep discounts are attracting petrochemical producers, centred in east China, **as they attempt to cushion the losses from weak margins.**

Propane dehydrogenation (PDH) margins in China have been negative since September last year, leading to operators cutting run rates yet maintaining them at 77pc in July to prove to lenders that they are still operational. PDH margins averaged minus \$109/t over January-July, compared with \$152/t a year earlier, Argus data show. PDH plants requiring imports have struggled more than integrated facilities owing to olefins oversupply and weak demand in Asian markets. China's downstream petrochemical demand has also been affected by Covid-19 lockdowns.

### Persian prices

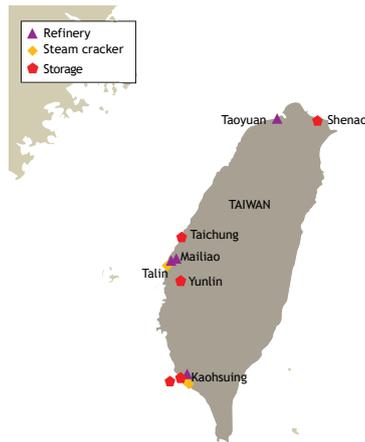
Iranian LPG cargoes for delivery to south China in September were priced at about \$5/t discounts to parity to the September CP swap on a cfr basis as of 10 August, market participants say, while offers to east China were closer to \$5/t premiums to the September CP. By contrast, Kuwait's KPC sold an evenly split propane-butane cargo at a \$53/t premium to September CP on a Japan delivery basis.

Iran's LPG exports are typically evenly split propane-butane or propane-heavy 44,000t cargoes suitable for China's residential and industrial markets. But China's PDH and ethylene producers require mostly propane, meaning the butane they buy from Iran is building at storage facilities. Traders are in turn attempting to sell the butane on the retail market or to niche downstream petrochemical customers, which could lead to oversupply.

## ASIA-PACIFIC

**The drills in the strait of Taiwan forced tankers and LPG carriers to divert course or reduce speed, writes Kevin Foster**

### Taiwan LPG infrastructure



## China military drills off Taiwan disrupt shipping

Chinese military drills in the Taiwan strait this month disrupted shipping in the area, including LPG carriers. The effect on commodity flows was relatively limited, but uncertainty is growing as tensions between China and Taiwan threaten to boil over.

Chinese military aircraft and vessels entered Taiwanese waters to carry out exercises on 2 August in response to the visit to the island of US House speaker Nancy Pelosi – the most senior US official to visit Taiwan in more than 25 years. Her visit is an infringement of Chinese sovereignty and a major political provocation, China’s foreign minister Wang Yi said on 3 August. Beijing has called the drills a warning to “Taiwanese independence” forces. Beijing claims sovereignty over Taiwan, while Taipei maintains it is an independent state. The US has built economic and security ties with Taiwan while acknowledging it remains a province of China.

The drills continued over the first half of August, prompting Taiwan to ready defences including missile systems, its defence ministry says. The exercises prompted tankers and LPG carriers to divert course or reduce speed, which created delays of up to three to four days for Japan-bound vessels, a shipbroker says. Other shipowners and brokers say business was largely unaffected. Several commercial airlines also cancelled or rerouted flights in response to the military exercises.

The geopolitical impact of the drills could be significant. Five missiles launched by China on 4 August landed in Japan’s exclusive economic zone, and several may have flown over Taiwan, Japan’s defence ministry says. The exercises are unjustified and risk unnecessary escalation, G7 ministers said on 3 August. China’s foreign ministry says the G7 statement was like “being transported back in time [to when] imperialist powers could run roughshod over Chinese people on Chinese soil”.

The waters around Taiwan – linking the major economies of China, Japan and South Korea to the South China Sea and the strait of Malacca – are among the busiest shipping lanes in the world. About 7mn bl of crude passes Taiwan’s east and west coast every day, heading to northeast Asia as well as to Taiwan.

## EUROPE

**The new regulation came into effect on 9 August, but Poland and Hungary insist they will not comply, writes Dafydd ab Iago**

## EU publishes rules on natural gas consumption cuts

The EU formally published new regulation detailing procedures to reduce the bloc’s natural gas consumption by 15pc on 8 August. The measures are intended to help the region in the event of a complete cut-off of Russian gas imports.

Poland and Hungary opposed the legislation and insist that they will not comply with the law, which was adopted with the agreement of the 25 other member states and came into force on 9 August. The emergency measures are justified by the growing risk of a “complete halt to Russian gas supplies by the end of 2022”, the EU says, adding that cutting use will help to ensure adequate supply and lower prices.

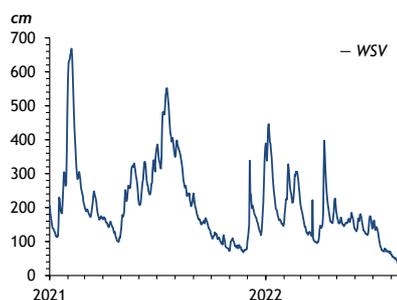
Polish prime minister Mateusz Morawiecki has hinted at further opposition to mandatory gas cuts “where Poland has the right to veto”. The European Commission cannot force Poland to reduce consumption, energy minister Anna Moskwa says. Energy security is the exclusive competence of each member state and Warsaw will “never agree to surrender it to the European level”, she says.

This same argument was used by Hungarian prime minister Viktor Orban, insisting that any decision on the forced reduction in domestic consumption would be exclusive to the Hungarian government. But Poland has already ended imports of Russian gas, whereas Hungary hopes to reach a deal with Russia for an extra 700mn m<sup>3</sup> of supply this summer.

## NORTHWEST EUROPE

**Dramatically falling river levels have led to barges reducing their weight capacity to 30pc, writes Liam Roche**

Rhine water levels at Kaub



### Rhine levels keep falling to stymie barge trade

Water levels on the Rhine have fallen further this month as hot and dry weather continues to grip northwest Europe, making barge trade uneconomical.

The low levels on the river, key to energy imports from the Amsterdam-Rotterdam-Antwerp (ARA) hub into Germany and other parts of mainland Europe, are increasingly affecting LPG barge trade despite recent weak demand. Buyers scrambled to secure deals for butane barges over 8-12 August, although prices were stable against naphtha as supply in ARA remains abundant.

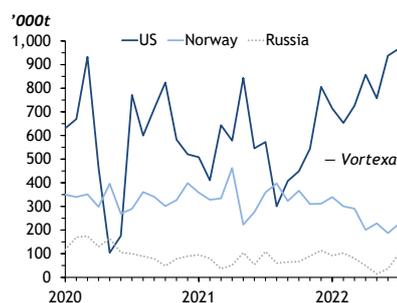
Rhine levels at the Kaub measuring point in Germany fell to 31cm on 15 August – the lowest in almost four years, data from German waterways and shipping agency the WSV show. Levels dropped into the upper 50cm range in the first two weeks of August, and are forecast by the WSV to stay in the low-30cm range for the rest of the week to 21 August. This should prevent barges travelling through the section, which has a lower limit of 40cm. Vessels have only been able to carry about 30pc of their capacity since levels fell below a threshold of 140cm in June.

Inland LPG buyers that rely on the Rhine are increasingly having to find alternative sources. “We see a reduction in propane available at German refineries, and a shift in collections from the refinery to terminals not connected to the waterways and primarily served by trucks and railcars,” a German trader says. But relying on these terminals may not be enough to breach the supply gap if low water levels persist into autumn. The dramatic rise in freight rates on the Rhine as a result of low water levels has made it too costly to trade barge cargoes, which already face volume restrictions. Rates from the Netherlands rose to more than €90/t (\$93/t) earlier this month from around €20/t in June.

## NORTHWEST EUROPE

**Lower LPG production in Europe is boosting purchases from the US, writes Liam Roche**

Monthly LPG exports to Europe



### US LPG imports swell to annual record on lost supply

Imports of LPG from the US to northwest Europe have already exceeded last year's total and reached a record annual high, with an open arbitrage incentivising flows to cover lower regional output and Russian arrivals.

The arrival of the very large gas carriers (VLGCs) *Chinook* and *Vega Song* in Antwerp, Belgium and Terneuzen, Netherlands, on 19 August will push US imports to northwest Europe above 4mn t this year, compared with 3.98mn t over the whole of 2021. Both VLGCs loaded from the 340,000 b/d (11mn t/yr) Marcus Hook terminal on the US east coast. Arrivals from the US have risen to 535,000 t/month in 2022 from 332,000 t/month last year, **peaking in July** – the latest Argus and Vortexa data putting the monthly total at closer to 758,000t as opposed to 816,000t. This puts them on track to stand at about 6.4mn t by the end of this year, which would represent close to a two-thirds increase from 2021.

Soaring European natural gas prices have cut LPG supplies in the region as upstream producers leave natural gas liquids in the gas stream and refineries consume LPG instead of gas. Norway is the largest regional upstream producer and exporter to mainland Europe, but its output and seaborne deliveries have plummeted this year. The country shipped 2mn t to European countries from between January and 16 August, down from 3mn t a year earlier, Vortexa data show.

Russia has also exported significantly less to Europe since it invaded Ukraine in February. Seaborne arrivals from the 2.4mn t/yr Ust-Luga terminal are being diverted to Turkey, India and potentially even China, while rail deliveries to Ukraine have stopped and are falling to other European countries.

The US-northwest European propane arbitrage has fluctuated from flat to positive territory, while it was negative for large parts of 2021, while for butane it has been firmly positive against only a mild premium a year earlier.

## NORTH AFRICA

**A fourfold rise in exports to Asia more than offset a drop in shipments to Mediterranean countries, writes Efcharis Sgourou**

Algeria LPG exports by region		'000t
	Jan-Jul	Jan-Jul 21
Africa	74	57
Asia	656	140
Mediterranean	2,504	2,903
Middle east	75	23
Northwest Europe	90	44
Other	42	2
Total	3,440	3,169

– Vortexa

### Algerian LPG exports to Asia-Pacific surge

Algeria's LPG exports to Asia-Pacific increased more than fourfold in the first seven months of 2022 from a year earlier, as shipments to Mediterranean buyers competed with a cheap influx of US cargoes and Morocco ended its supply contracts.

The country's shipments to Asia-Pacific rose to 640,000t in January-July, up from 140,250t a year earlier, data from Vortexa show. This represented almost a fifth of Algeria's total exports of 3.4mn t in January-July, up from 4pc a year earlier. The largest recipient during this timeframe was China, which took in 290,000t, or almost 40pc of the total of exports that headed to Asia. Mediterranean countries imported 2.5mn t from Algeria, down by 14pc on the year.

An open arbitrage to the Mediterranean region from the US from late 2021 until June allowed a flood of cheaper cargoes to make the transatlantic voyage, increasingly squeezing out Algerian supply. The US exported more than 3mn t of LPG to the region in January-July, up from 2.3mn t a year earlier.

Morocco in particular has benefited from the open US arbitrage, after a breakdown in diplomatic relations with Algeria led it to pivot away from the exporter's LPG. The last term contract between the two neighbours expired earlier this year, forcing Morocco to look west for shipments, and Algeria to the east.

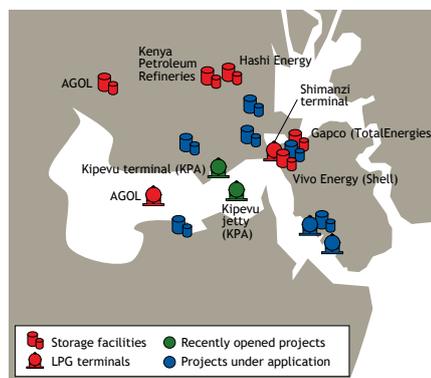
China has emerged as a viable alternative for Algeria given its fast-expanding demand for LPG imports. More than half of Algerian shipments to China were delivered to the northeastern Yantai port to feed Wanhua Chemical's propane cracker, while about 15pc went to Ningbo, where two propane dehydrogenation (PDH) plants are based as well as the Zhenhai refinery. Another 15pc was delivered to Nansha port in Guangzhou, where wholesaler China Gas owns a terminal. And less than 10pc went to Fuzhou port, where another PDH plant is located.

As a result, China's intake of Algerian LPG doubled on the year in January-July. Other Asian countries have become buyers of Algerian cargoes for the first time. Indonesia has received 190,000t in the first seven months, while Malaysia, Singapore and Thailand have brought in 200,000t combined.

## EAST AFRICA

**The upgraded Kipevu terminal is now able to accept VLGCs although a lack of nearby storage capacity may limit arrivals, writes Mercy Matsiko**

### LPG infrastructure in Mombasa



### Kenya completes Mombasa terminal expansion

Kenya has opened its upgraded Kipevu Oil Terminal in Mombasa, after completing the construction of a 770m jetty that will allow large vessels to stop at the port.

Vessels of up to 200,000 deadweight tonnes (dwt) carrying crude, oil products and LPG will be able to load and discharge at the jetty, according to Kenya's energy ministry petroleum commissioner Martin Heya. Modern very large gas carriers (VLGCs) usually hold about 84,000m<sup>3</sup> and have a dwt of about 55,000t. The new jetty will save the country more than \$1mn/yr in demurrage costs, helping to lower retail fuel prices, Heya says.

The \$385mn expansion project, including a new berth for VLGCs, should allow more imports to the terminal, which already has an LPG berth for smaller vessels. But it may also be restricted by limited storage capacity in Mombasa, with [several projects](#) yet to come to fruition. The project was originally set to finish in August 2021, but supply chain issues related to the Covid-19 pandemic and difficulties acquiring land to connect the terminal to state-owned Kenya Pipeline facilities has led to [multiple delays](#). Its construction was funded by the Kenya Ports Authority.

Kenya hopes the new Kipevu terminal will help the country compete with Tanzania, which acts as a supply hub for the Great Lakes region. A three-year closure of the border between Uganda and Rwanda, and lower tariffs at Tanzania's Dar es Salaam port, made both countries depend more on Tanzania. Kenya also seeks to supply Indian Ocean islands such as Zanzibar, Seychelles and Mauritius.

## IN BRIEF

### Asia-Pacific

#### Petchem outlook still weak: LG Chem

South Korean petrochemical firm LG Chem has maintained its expectation of weak global demand in the third quarter as a result of high oil prices and inflation. The firm's petrochemical sales totalled 5.99 trillion won (\$4.6bn) in the second quarter, up by 0.4pc from January-March and 14pc from a year earlier. It did not disclose its sales volumes, but its petrochemical profits fell by 19pc on the quarter and 61pc on the year to W513bn. The "difficult situation" will continue into this quarter owing to sluggish global demand, increased supply and "off-cycle seasonality", SG Chem said late last month. South Korean propane dehydrogenation (PDH) operator Hyosung Chemical also posted a deeper second-quarter loss, dropping to W68.1bn from W33.2bn in the first quarter, and down from a profit of W71.3bn a year earlier.

### Europe

#### Evonik to swap gas for LPG at Marl plant

German chemical producer Evonik has started using LPG in place of natural gas to generate electricity at its Marl plant, as Germany moves to reduce its dependence on Russian gas. The announcement came on the day the EU published regulations on cutting gas use by up to 15pc this winter owing to the risk of being completely cut off from Russian imports by the end of the year. Substituting gas with LPG and other alternatives at its German production plants could replace up to 40pc of the country's gas supply "without significantly curtailing chemicals production", Evonik says. The company will redirect some of its own LPG output to Marl in northwest Germany, as well as some LPG from BP's 257,000 b/d Gelsenkirchen refinery. The firm plans to substitute gas with fuel oil at its Steinau, Essen, Krefeld, Lulsdorf and Wesseling facilities.

### Middle East

#### Dana Gas profit drops in 1H22

Abu Dhabi-listed Dana Gas' first-half profit fell by a fifth on the year to \$111mn, mainly owing to a one-off impairment reversal in Egypt a year earlier. The firm's output of natural gas, LPG and condensate in January-June fell by 5pc on the year to 61,100 b/d of oil equivalent (boe/d), with a 1pc rise in Iraqi output offset by a 9pc decline in Egypt. Production in Iraq's semi-autonomous Kurdistan region averaged 34,500 boe/d, up from 34,300 boe/d a year earlier. Dana and Sharjah-based Crescent Petroleum are expanding output at the [Khor Mor gas field](#) with a new 250mn ft<sup>3</sup>/d (2.6bn m<sup>3</sup>/yr) processing facility set to start up in the second quarter of 2023.

### Shipping

#### Dorian profits on higher VLGC rates

New York-listed shipowner Dorian LPG's profits firmed in the second quarter owing to higher freight rates more than outweighing more costly bunker fuels.

The firm made a profit of \$24.8mn in April-June, up from \$5.9mn a year earlier. Its time charter equivalent (TCE) revenues rose to \$39,610/d from \$31,570/d a year earlier, supported by higher very large gas carrier (VLGC) spot rates. These increased to around \$76/t on a Ras Tanura-Chiba basis for trips from the Mideast Gulf to northeast Asia, from \$52/t a year earlier, while Houston-Chiba rates rose to \$122/t from \$88/t.

VLGC rates were boosted by more LPG exports in the second quarter, with the US shipping around 13.7mn t, up by 1.7mn t from January-March. Saudi Arabian exports stood at around 600,000 t/month in April-June, according to Dorian – the country exported about 540,000 t/month in the first quarter and 470,000 t/month a year earlier, Vortexa data show. But demand for vessels was partially offset by weak propane dehydrogenation margins and Covid-19 restrictions reducing import demand for propane in China, Dorian says.

Bunker fuel prices increased to all-time highs in the second quarter, with 0.5pc sulphur 380cst dob Fujairah levels rising to around \$965/t from \$774/t in January-March and \$500/t a year earlier. In the US, 0.5pc sulphur 380cst prices increased to around \$880/t from \$507/t in the second quarter of 2021.

Utilisation of Dorian's fleet of 22 VLGCs, including its two chartered-in vessels, slipped to 95.9pc on the year from 96.1pc, but rose from 89.3pc on the quarter. The firm's operating expenses fell to \$9,380/d from \$10,130/d following the sale of the *Captain Markos NL* and the *Captain Nicholas NL* in August and March, respectively.

#### New VLGCs lift KSS' profits to record high

South Korean shipowner KSS Line posted record profit and sales in the first half of 2022, helped by an expansion of its LPG fleet. The firm's profit rose by 26pc on the year to 30.2bn won (\$23mn), while sales revenues hit W205.6bn, up by 45pc. A key factor for reaching the record levels was the delivery of five new VLGCs within the year, the firm says. Foreign exchange moves supported the gains. KSS Line expects sales to be around W400bn over the whole of 2022, with profits of around W64bn. It is due to take delivery of another new dual-fuel VLGC that can run on LPG and methanol later this year. KSS Line's fleet comprises 14 VLGCs, three midsize LPG carriers, one pressurised coaster, six tankers and four LNG carriers. It expects delivery of two VLGCs in 2023.

## IN BRIEF

### US

#### DCP ships more NGLs by pipeline in 2Q

Colorado-based DCP Midstream increased its deliveries of unfractionated natural gas liquids (NGL) along its pipelines in the second quarter as upstream output in the Permian basin and midcontinent grew.

Shipments on the firm's Sand Hills NGL pipeline, which runs from the Permian basin in south Texas to fractionators in Mont Belvieu on the Gulf coast, rose by 5pc on the year to 304,000 b/d, the firm says. Deliveries along the Front Range line, from production areas in Colorado to north Texas, increased by 30pc to 78,000 b/d, while volumes on the Southern Hills link from the midcontinent to Mont Belvieu rose by 5pc to 122,000 b/d.

DCP is considering low-cost expansions to the Southern Hills and Sand Hills lines given higher utilisation, but it is not interested in large-scale investments, chief executive Wouter van Kempen says. "We will not do a 'build it and they will come' project," he says.

DCP has hedged 15,163 b/d of its expected NGL throughput in the third quarter at an average price of 78¢/USG. The firm closed a \$160mn acquisition of the 120mn ft<sup>3</sup>/d (1.24bn m<sup>3</sup>/yr) James Lake gas processing plant and associated pipelines in the Permian on 1 August.

DCP's profit surged to \$383mn in the second quarter compared with a \$31mn loss a year earlier.

#### UGI and Suburban's US retail sales fall

US-based distributor UGI reported a \$7mn loss in the second quarter, down from a \$150mn profit a year earlier, as its LPG sales in the US and Europe fell. Retail sales from the firm's US unit AmeriGas declined by 6pc on the year to around 173mn USG (355,000t) as a result of delivery driver shortages and higher retail prices, and despite US temperatures being 17pc below average for the period, UGI says. Its European arm UGI International sold 155mn USG in April-June, down by 7pc on the year, owing to warmer weather and regional retail prices rising by nearly two-thirds. Peer Suburban Propane also posted a drop in sales, by 1.6pc to 75.5mn USG during its fiscal third quarter ending 25 June. The company attributed this to higher commodity prices and lower consumer spending. Suburban made a loss of \$2.5mn in the three months, recovering from a \$26mn loss a year earlier.

#### Enlink's Permian gas gathering surges

Texas-based Enlink Midstream's natural gas gathering in the Permian basin rose by nearly a half on the year to 1.49bn Btu/d in the second quarter, following the start-up of its 95mn ft<sup>3</sup>/d (980mn m<sup>3</sup>/yr) War Horse and 240mn ft<sup>3</sup>/d Tiger gas processing plants in the fourth quarter of 2021. The

company expects further growth later in the year following its 1 July acquisition of the Crestwood Equity gathering and processing system in north Texas, which includes 425mn ft<sup>3</sup>/d of processing capacity. The company's natural gas liquids (NGL) fractionation throughput on its Louisiana system rose to 188,000 b/d from 184,000 b/d a year earlier. Higher NGL processing and commodity prices helped lift profit to \$123.9mn from \$9mn a year earlier, while the firm raised its 2022 profit forecast again to \$390mn-430mn.

### Canada

#### Pembina mulls Redwater frac expansion

Canadian midstream firm Pembina Pipeline may add 55,000 b/d of natural gas liquids (NGL) fractionation capacity at its Redwater complex in Alberta, Canada, after securing long-term commitments from three Montney shale producers in northeast British Columbia. The expansion, which would take around two years to develop including supporting storage, rail and pipeline infrastructure, would bring the firm's total fractionation capacity at Redwater to just under 300,000 b/d. Pembina's fractionators in Alberta have been operating at capacity amid growing upstream output in the region. Some relief in fractionation capacity tightness in western Canada might come when peer Wolf Midstream commissions its 70,000 b/d fractionator in Alberta next year. Pembina's NGL throughput stood at 176,000 b/d oil equivalent in the second quarter, unchanged from a year earlier, while its profit rose to C\$418mn (\$323mn) from C\$254mn.

#### Keyera to start AEF turnaround in Sep

Canadian midstream firm Keyera is to shut down its Alberta EnviroFuels (AEF) iso-octane plant in Edmonton for six weeks in mid-September for works. AEF is one of the largest butane consumers in western Canada, using it as a feedstock for the gasoline component. Edmonton butane prices normally fall when the facility goes off line for maintenance. Keyera says natural gas liquids (NGL) fractionation capacity in western Canada remains tight after reporting high utilisation at its Fort Saskatchewan NGL facility in the second quarter. The firm's profit rose to C\$173mn (\$135mn) in April-June from C\$78.5mn a year earlier.

#### Superior Plus propane sales rise in 2Q

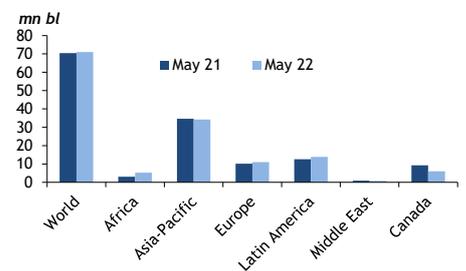
Canadian LPG distributor Superior Plus posted an increase in sales in the second quarter on colder weather and several acquisitions over the past 18 months. Its Canadian propane sales rose to 226mn litres (115,000t) as commercial demand rose and the weather was 11pc colder than a year earlier, the firm says. Its propane sales in the US increased to 242mn l from 212mn l because of colder weather and after completing at least 10 company takeovers in 2021-22.

## TRADE FLOWS: US EXPORTS

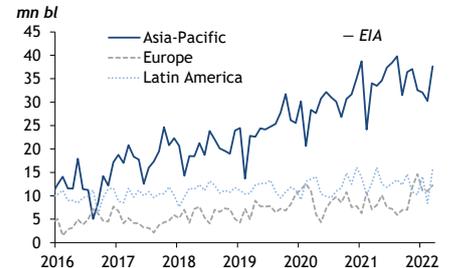
US NGL exports*				'000 bl
Exports by country	May	Mar-May	Mar-May 21	±%
China	9,965	27,177	24,540	10.7
Japan	11,075	33,197	34,350	-3.4
Singapore	1,124	5,177	2,185	136.9
South Korea	4,882	15,631	13,177	18.6
Other Asia-Pacific	7,218	23,931	28,029	-14.6
<b>Total Asia-Pacific</b>	<b>34,264</b>	<b>105,113</b>	<b>102,281</b>	<b>2.8</b>
Ghana	166	412	0	-
Morocco	1,544	3,938	3,897	1.1
Ivory Coast	481	815	1,756	-53.6
Other Africa	3,017	8,223	6,403	28.4
<b>Total Africa</b>	<b>5,208</b>	<b>13,388</b>	<b>12,056</b>	<b>11.0</b>
Belgium	1,606	5,748	2,122	170.9
France	522	1,240	3,520	-64.8
Netherlands	2,843	7,593	6,781	12.0
Portugal	1,122	3,450	1,280	169.5
Spain	1,126	3,624	1,037	249.5
UK	976	5,508	3,669	50.1
Other Europe	2,800	7,596	6,943	9.4
<b>Total Europe</b>	<b>10,995</b>	<b>34,759</b>	<b>25,352</b>	<b>37.1</b>
Aruba	0	11	27	-59.3
Brazil	2,962	5,212	7,924	-34.2
Chile	1,327	4,611	4,272	7.9
Dominican Rep.	1,467	3,843	3,549	8.3
Ecuador	1,066	3,650	4,312	-15.4
Guatemala	237	1,063	958	11.0
Honduras	448	1,544	1,554	-0.6
Mexico	4,539	18,881	13,356	41.4
Panama	199	623	245	154.3
Peru	453	1,103	1,198	-7.9
Other Latin America	1,129	3,015	4,101	-26.5
<b>Total Latin America</b>	<b>13,827</b>	<b>43,556</b>	<b>41,496</b>	<b>5.0</b>
Turkey	769	3,733	4,163	-10.3
Other Middle East	0	1	0	-
<b>Total Middle East</b>	<b>769</b>	<b>3,734</b>	<b>4,163</b>	<b>-10.3</b>
Canada	6,016	21,410	28,507	-24.9
<b>Total exports</b>	<b>71,079</b>	<b>221,960</b>	<b>213,855</b>	<b>3.8</b>

\*US government agency the EIA stopped publishing export data under its LPG category from July. LPG World will replace the LPG data with the EIA's export figures for natural gas liquids (NGL) until a new page layout capturing propane and normal butane exports has been established.

US exports: year-on-year change

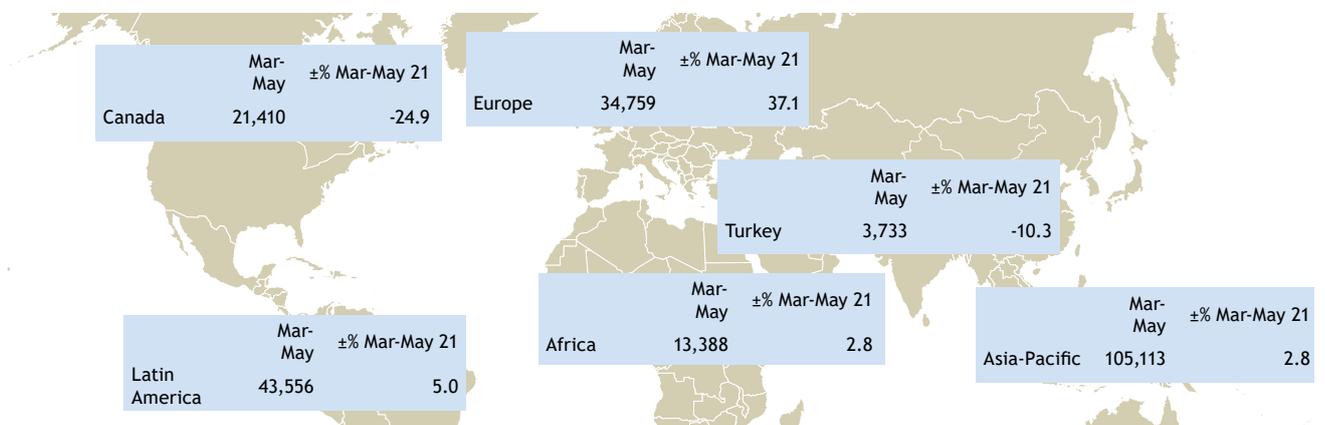


US exports: key regions



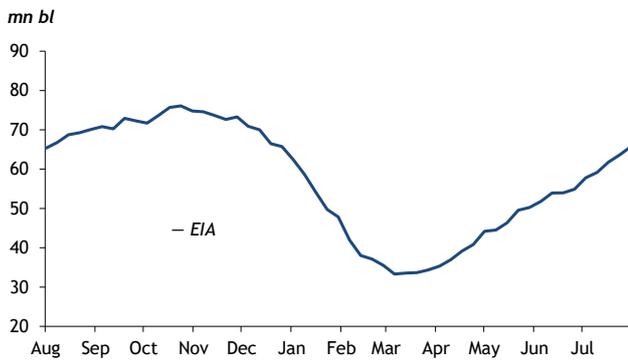
US exports by region

'000 bl



## INVENTORIES: US

Total US weekly propane stocks



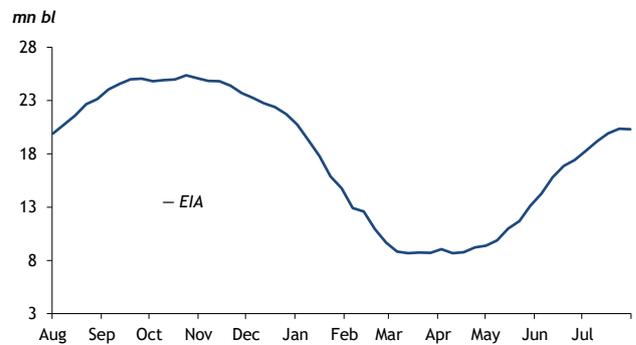
US Gulf coast stocks



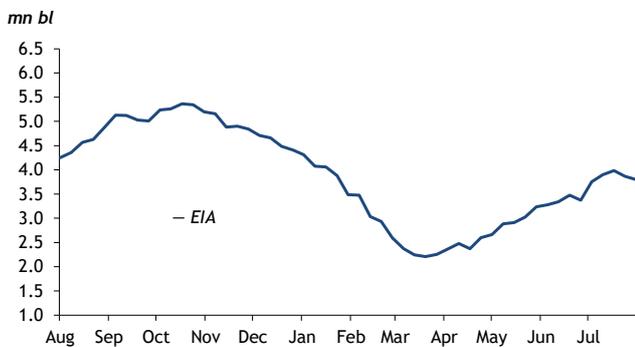
US east coast stocks



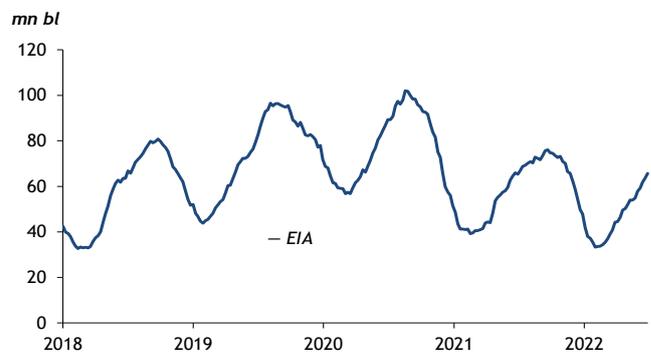
US midcontinent stocks



US west coast stocks



US stocks 5-year view



## MARKET ANALYSIS

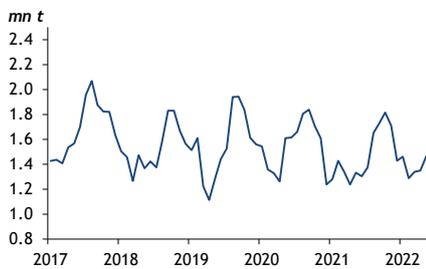
■ US propane inventories posted a smaller-than-expected build of just over 2mn bl to 65.6mn bl (5.29mn t) over the week to 5 August, government agency the EIA data show. This pushed stocks 0.5pc above levels a year earlier. The slighter increase came as a result of US midcontinent stocks falling after Oneok's 210,000 b/d fractionator in Oklahoma was taken off line following a fire on 9 July.

■ US midcontinent stocks fell by 40,000 bl to 20.3mn bl but remained above 2021 levels. Gulf coast inventories rose by 1.3mn bl to 34.5mn bl, while on the east coast they rose by 866,000 bl to 7.06mn bl. US propane exports increased to 1.56mn b/d from 1.48mn b/d, but domestic demand fell to 606,000 b/d from 746,000 b/d. Propane output in the country rose to 2.34mn b/d from 2.38mn b/d.

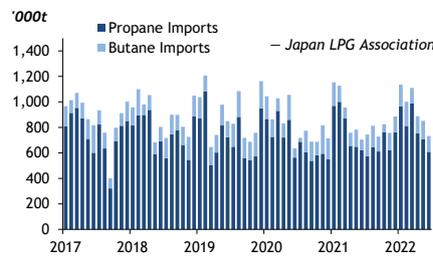
## TRADE FLOWS: JAPAN, SOUTH KOREA

Japanese LPG imports							'000t
Imports by country	Jun	Apr-Jun	Apr-Jun 21	22/21 ±%	Apr-Jun 20	22/20 ±%	2022
Saudi Arabia	0.0	0.0	0.0	-	10.0	-100.0	0.0
Qatar	10.0	44.1	34.2	28.9	63.9	-31.0	90.1
Kuwait	22.7	147.1	143.0	2.8	130.8	12.4	378.7
UAE	0.0	13.8	0.0	-	6.5	112.1	128.3
Australia	118.7	245.3	129.2	89.9	249.5	-1.7	505.6
US	455.9	1,449.3	1,492.4	-2.9	1,506.1	-3.8	3,469.3
Others	141.0	496.5	398.3	24.6	279.9	77.4	900.8
<b>Total imports</b>	<b>748.3</b>	<b>2,396.0</b>	<b>2,197.1</b>	<b>9.1</b>	<b>2,246.7</b>	<b>6.6</b>	<b>5,472.9</b>
Imports by product							
Propane	690.6	2,190.9	2,018.7	8.5	2,060.8	6.3	4,936.2
Butane	57.7	205.1	178.4	15.0	185.9	10.3	536.6

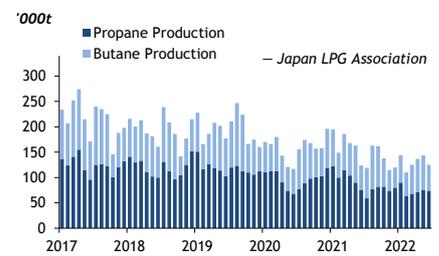
Japan: LPG stocks



Japan: LPG imports



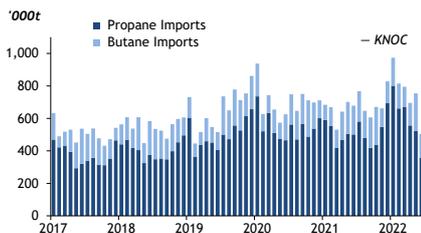
Japan: LPG production



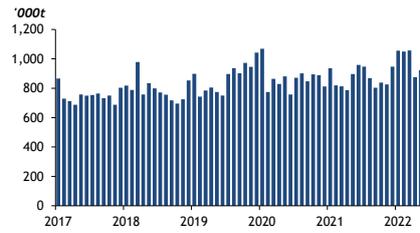
South Korean LPG imports

South Korean LPG imports							'000t
Imports by country	Jun	Apr-Jun	Apr-Jun 21	22/21 ±%	Apr-Jun 20	22/20 ±%	2022
US	432	1,621	1,943	-16.6	1,893	-14.4	3,680
UAE	0	47	34	38.2	0	-	52
Qatar	0	0	0	-	0	-	8
Australia	10	42	24	75.0	0	-	211
Nigeria	0	0	0	-	0	-	46
Kuwait	0	0	0	-	0	-	46
Saudi Arabia	0	0	46	-100.0	0	-	0
Others	36	163	90	81.1	16	918.8	380
<b>Total imports</b>	<b>478</b>	<b>1,873</b>	<b>2,137</b>	<b>-12.4</b>	<b>1,909</b>	<b>-1.9</b>	<b>4,423</b>
Imports by product							
Propane	358	1,433	1,580	-9.3	1,610	-11.0	3,555
Butane	121	441	556	-20.7	299	47.5	868

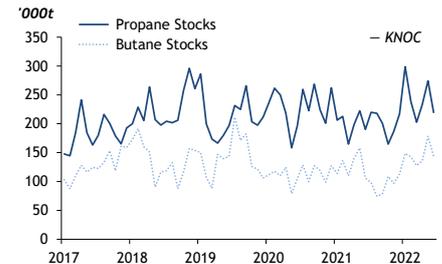
South Korea: LPG imports



South Korea: LPG consumption



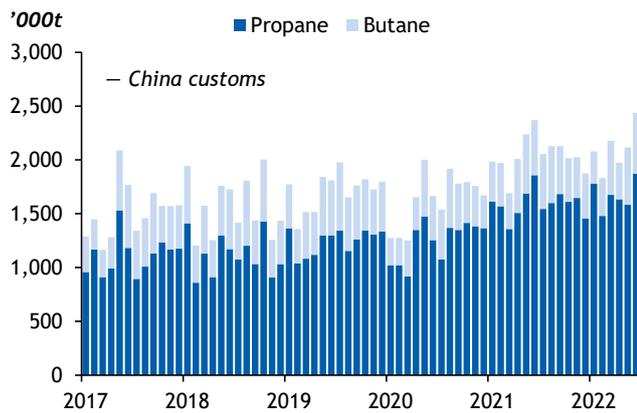
South Korea: LPG stocks



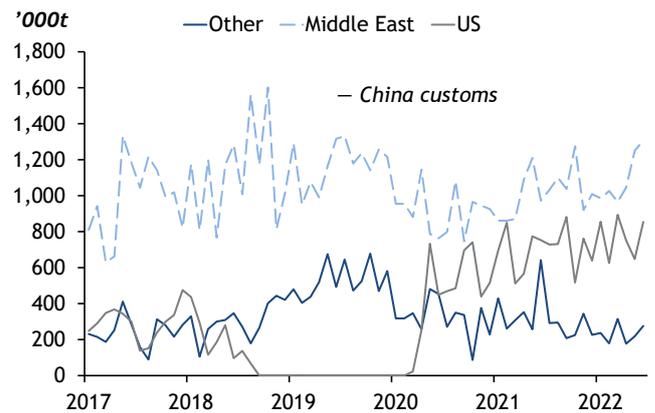
## TRADE FLOWS: CHINA

China LPG imports							'000t
Imports by country	Jun	Apr-Jun	Apr-Jun 21	22/21 ±%	Apr-Jun 20	22/20 ±%	2022
US	854	2,254	2,093	7.7	1,434	57.2	4,629
UAE	575	1,533	1,015	51.0	914	67.7	2,890
Qatar	297	812	873	-7.0	693	17.2	1,546
Saudi Arabia	0	178	91	95.6	325	-45.2	322
Kuwait	105	152	425	-64.2	296	-48.6	266
Australia	64	211	405	-47.9	238	-11.3	397
Others	541	1,387	1,715	-19.1	1,422	-2.5	2,561
<b>Total imports</b>	<b>2,436</b>	<b>6,527</b>	<b>6,617</b>	<b>-1.4</b>	<b>5,322</b>	<b>22.6</b>	<b>12,611</b>
Imports by product							
Propane	1,872	5,089	5,053	0.7	4,078	24.8	10,022
Butane	566	1,439	1,564	-8.0	1,244	15.7	2,593

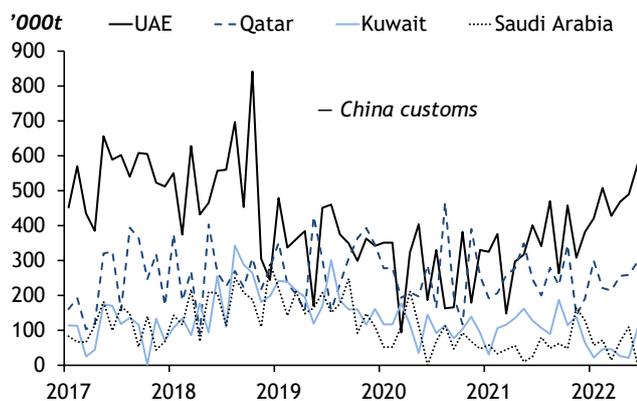
China LPG imports by product



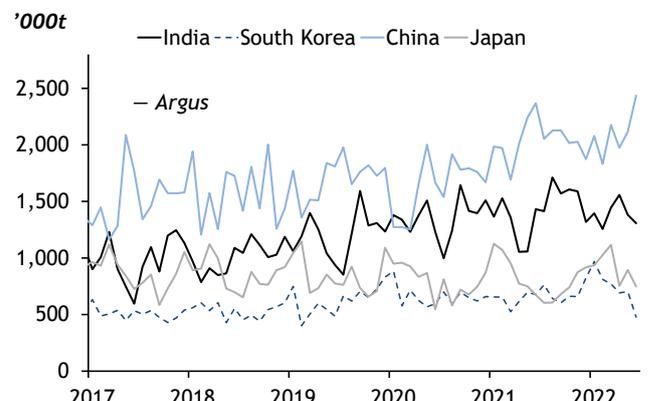
China LPG imports by origin



China LPG imports from Middle East

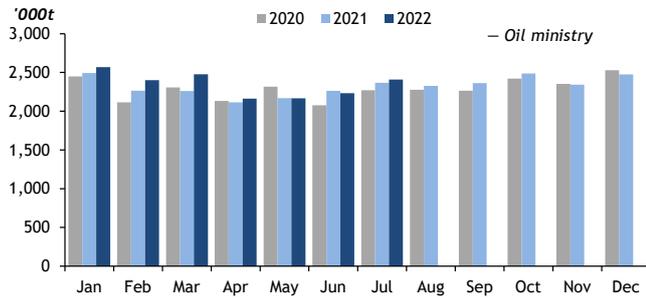


Key Asia-Pacific LPG importers

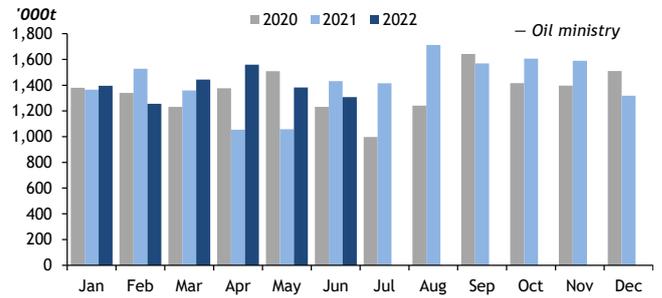


## STATISTICS: ASIA

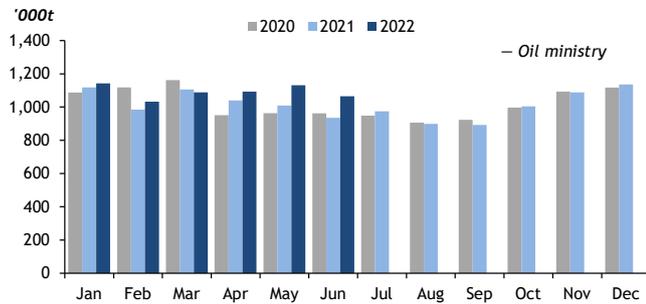
India: LPG demand



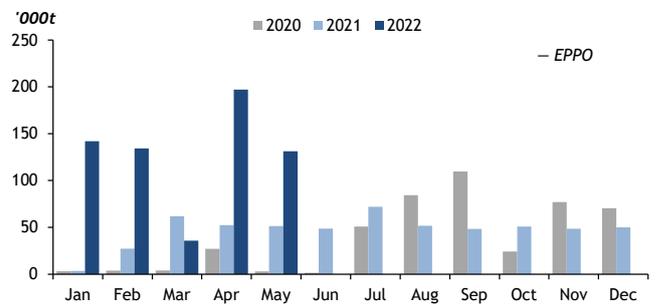
India: LPG imports



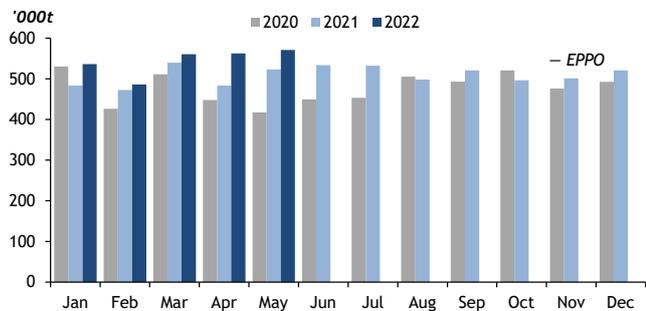
India: LPG production



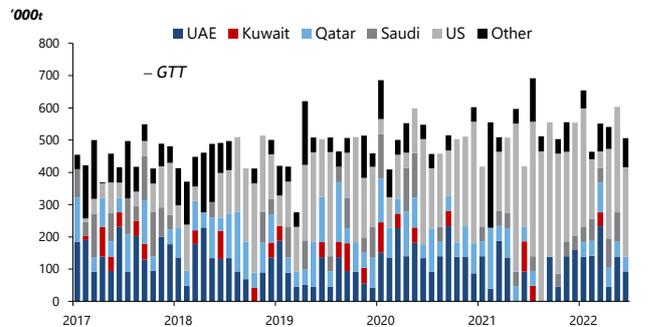
Thailand: LPG imports



Thailand: LPG consumption



Indonesia: LPG imports origin



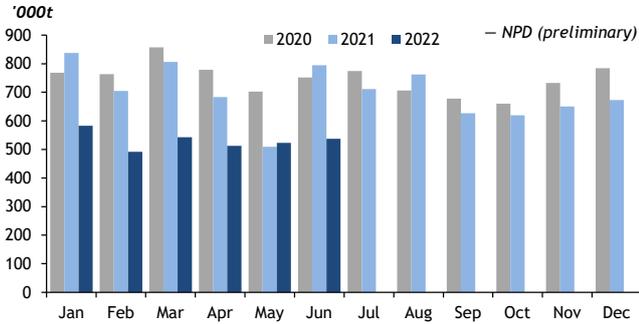
## MARKET ANALYSIS

- Australia's butane exports fell by 58pc on the month and 23pc on the year to 62,000t in June, customs data show. Shipments hit a 10-month high of 148,200t in May, revised down from the [previous estimate of 149,400t](#).
- The country's butane exports stood at 686,000t in the first half of 2022, up by 18pc from a year earlier.

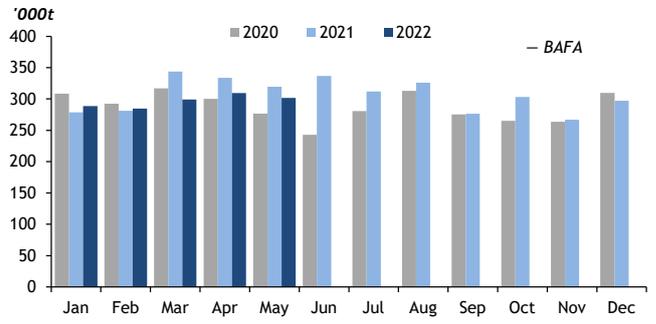
- The drop in exports in June is likely to have been linked to Shell shutting down its 3.6mn t/yr Prelude floating LNG facility offshore Western Australia from 10 June because of industrial action. The plant resumed shipments in April, having been off line since early December. Prelude can produce about 400,000 t/yr of LPG. Australia's statistics agency ABS does not provide propane export data.

## STATISTICS: EUROPE

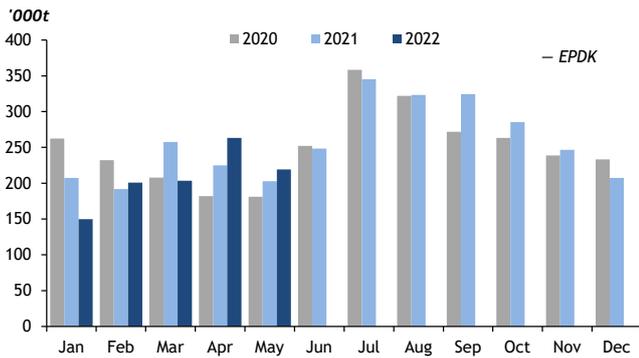
Norway: NGL production



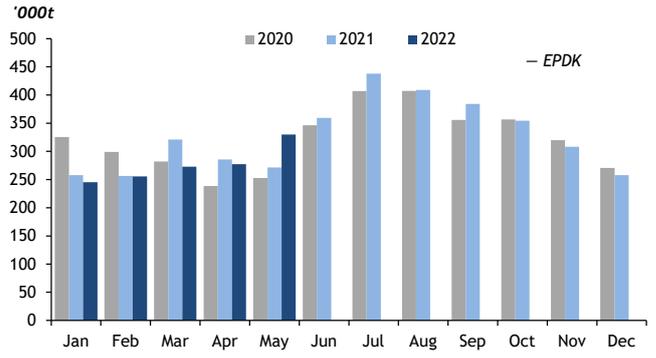
Germany: inland LPG deliveries



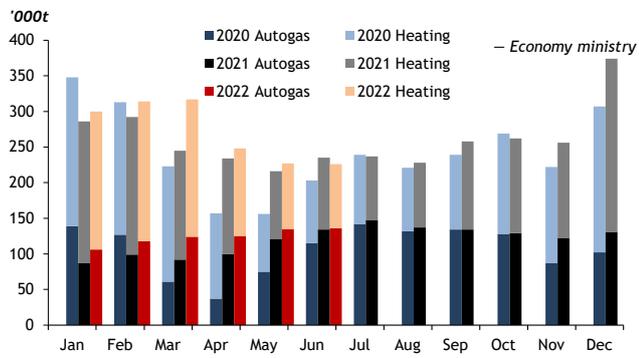
Turkey: LPG imports



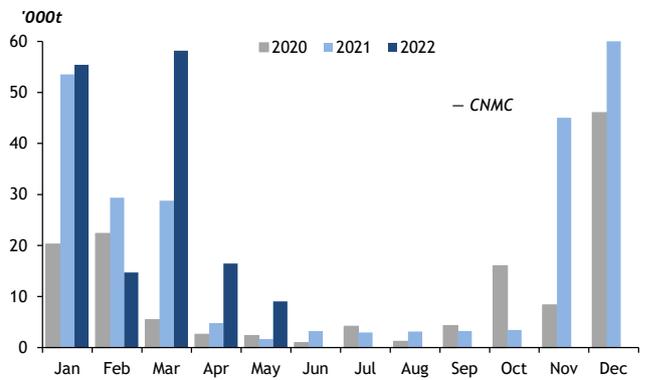
Turkey: LPG consumption



Italy: LPG transport and heating consumption



Spain: LPG imports



## EUROPEAN PROPANE

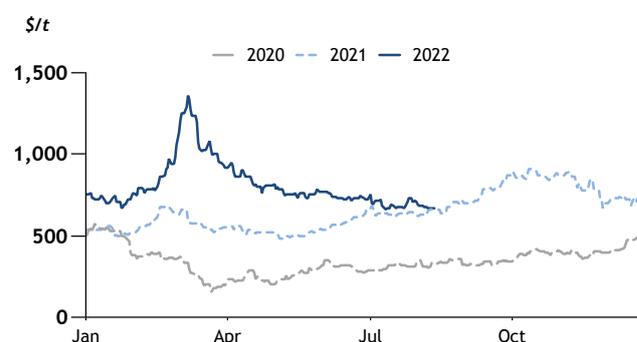
■ Large cargo propane demand was limited over the first half of August, with only one bidder emerging on 10 August for a split-month August-September cargo worth \$607.75/t basis Flushing, but no deals were done.

■ The buying interest supported pricing slightly, but physical values were still at a \$4.25/t discount to September cif Amsterdam-Rotterdam-Antwerp (ARA) swaps. The outright large cargo price fell by \$29.50/t to \$635.25/t cif ARA by 11 August compared with \$664.75/t on 29 July.

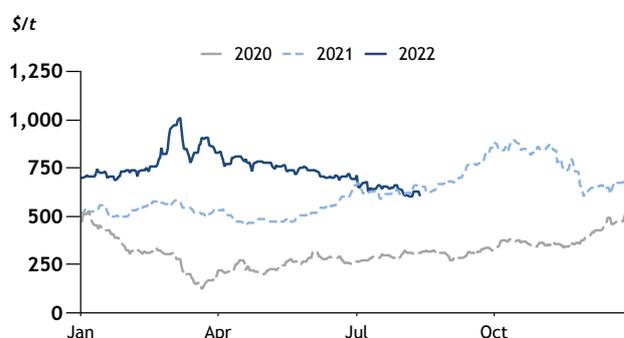
■ Propane coaster prices lost ground in early August on weak demand, falling on both on an outright basis as the wider energy complex declined and against large cargo assessments. The price fell by \$61/t to \$671/t fob northwest Europe between 29 July and 11 August.

■ The small cargo market at the ARA hub was quiet in the first half of August despite levels on the Rhine river falling to multi-year lows on drought conditions. Railcar and barge prices both fell by \$10/t to \$730/t fca ARA and fob ARA, respectively. The two main causes for recent inactivity in the market were continuing low availability from refineries and weak heating demand.

Propane cif NWE cargoes small



Propane cif Mediterranean cargoes large



## EUROPEAN BUTANE

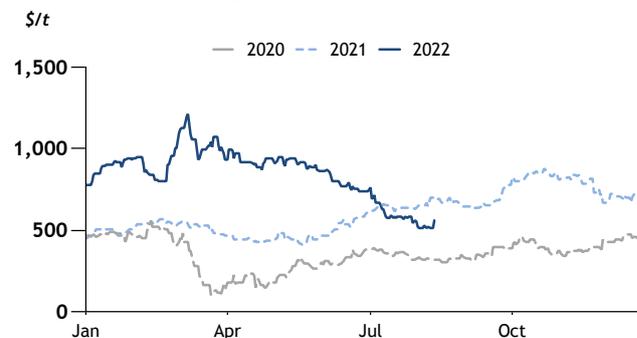
■ Large cargo butane trading was muted in the first half of August. Prices steadied at under 90pc of naphtha, while the outright price fell by \$55.75/t to \$601.50/t cif ARA by 11 August from \$657.25/t on 29 July in line with sliding crude and naphtha values.

■ Delivered coaster prices fell by \$26.25/t to \$585.25/t, but stronger petrochemical sector demand lifted the price relative to naphtha to 88pc from 82.5pc. Some buying interest also emerged from the gasoline blending sector.

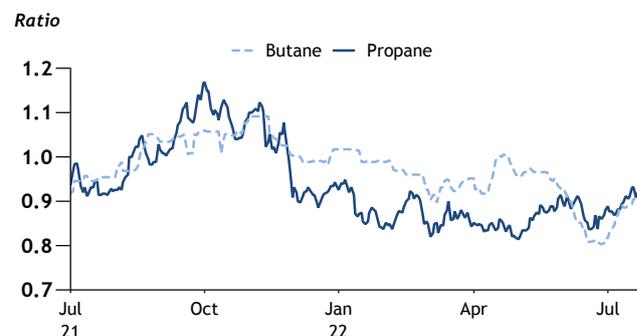
■ Plummeting water levels on the Rhine river disrupted butane barge trade. Sellers at the ARA hub sought alternative ways to offload supply that they were unable to send down the waterway. The butane barge fob ARA price rose by 7 percentage points to 85pc of naphtha on petrochemical sector buying.

■ Mediterranean buyers were well covered by term contracts in early August, with little to no spot demand apparent. This resulted in coaster prices falling by \$111.25/t to \$560/t fob Lavera.

Butane fob NWE cargoes small



Propane and butane ratios to naphtha NWE



## FSU LPG

■ Russian LPG producers raised prices by 1,000-5,500 roubles/t (\$17-91/t) in the first half of August on firming seasonal demand and maintenance at production facilities.

■ Propane-butane mix prices at the Poland-Belarus border fell by \$2.50/t to \$667.50/t daf Brest between 29 July and 11 August owing to ample inventories in Poland and weaker demand. Buying emerged from Germany and the Czech Republic, while Ukrainian traders reduced their purchases. Several Polish traders expected livelier demand for autogas in late August and September.

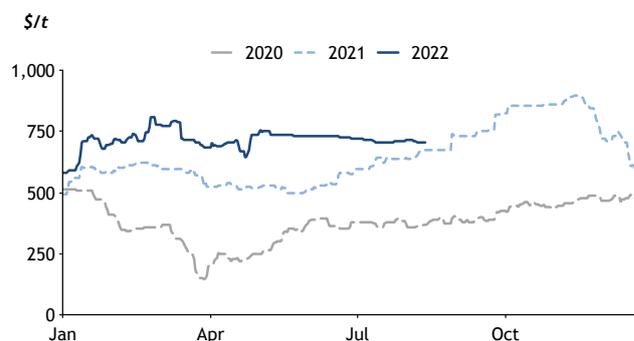
■ Railway LPG exports from Russia to Poland totalled 17,140t during 1-11 August compared with 6,320t a month earlier. LPG rail shipments amounted to 44,500t in the whole of July and 66,300t in June.

■ LPG shipments from Kazakhstan to Poland by rail decreased to 418t over 1-11 August from 3,130t a month earlier. Kazakh LPG deliveries to the country stood at 5,100t over the whole of July and 17,900t in June.

■ Propane prices at the Poland-Belarus border declined by \$5/t to \$705/t daf Brest between 29 July and 11 August tracking propane-butane mix values. Polish traders expected stronger demand to emerge soon before the start of corn drying season.

■ The price of propane-butane mix at the Uzbekistan-Tajikistan border increased to \$340/t daf Bekabad from \$315/t two weeks earlier as a result of limited supply from Kazakhstan and Russia. Chevron-led Kazakh producer Tengizchevroil (TCO), the largest LPG exporter to Tajikistan, reduced output in August owing to maintenance.

Propane Argus daf Brest



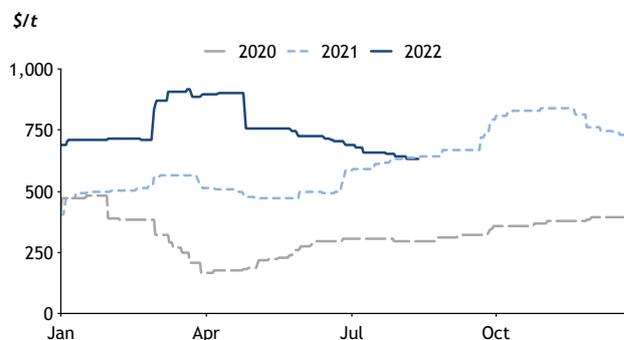
## BLACK SEA LPG

■ Black Sea coaster assessments declined during the first half of August following Algerian state-owned Sonatrach lowering its monthly prices for August cargoes – to \$660/t for propane and \$645/t for butane.

■ Propane-butane mix prices dropped by \$2.50/t to \$597.50/t fob Black Sea over the first half of August. Propane values declined by \$25/t to \$630/t, while butane assessments fell by \$22.50/t to \$610/t.

■ Total LPG shipments from Black Sea and Sea of Azov ports decreased to 20,400t between 24 July and 10 August compared with 35,600t over 1-23 July.

Propane Argus fob Black Sea



## ASIA PROPANE

■ Propane prices fell alongside losses on crude during the first half of this month. The Argus Far East Index (AFEI) for propane dropped by 3.6pc to \$674/t over 1-12 August.

■ A prompt supply overhang weighed on the price of 23,000t cfr Japan cargoes, which fell to \$15/t discounts to September AFEI swaps. A propane dehydrogenation plant (PDH) in Qingdao, China, bought two 46,000t cargoes for 5-30 September delivery, at a \$8/t discount to September AFEI and a \$32/t premium to September CP paper, respectively.

■ Weak petrochemical margins curbed feedstock demand from ethylene crackers and PDH plants at a time of already low heating use. A propane-fed cracker in Ningbo cancelled a tender to buy 23,000t propane for 21-30 September delivery after the buyer measured propane swaps values against naphtha equivalents and found the offers unattractive.

■ Qatar Energy sold a 45,000t propane cargo loading in September to a Chinese trader on a netback basis to September AFEI paper.

## ASIA BUTANE

■ Butane Argus Far East Index (AFEI) prices fell by 3.8pc to \$664/t during 1-12 August on abundant supply.

■ Supply of evenly split propane-butane cargoes from the Mideast Gulf in September remained high. Kuwaiti producer KPC sold a similar cargo loading 11-12 September at a \$15/t discount to the September CP swap.

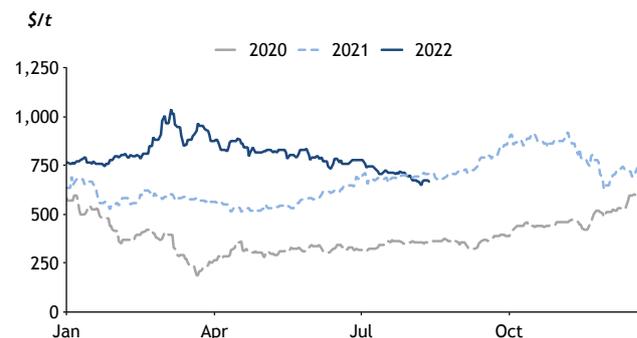
■ September AFEI paper narrowed to a \$21/t discount to September naphtha, which curtailed incentive for northeast Asian ethylene producers to switch feedstocks.

## ASIA PRESSURISED

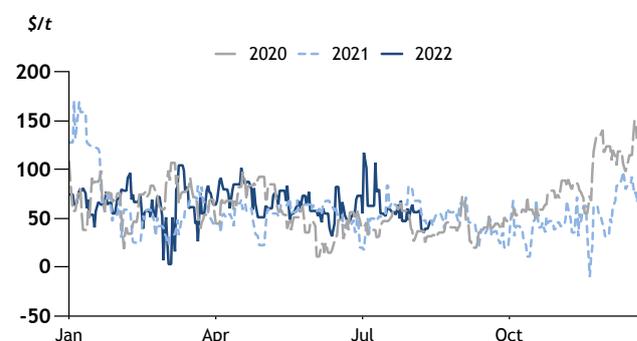
■ The price of coaster shipments from terminals in south China held steady at \$40/t premiums to state-controlled Saudi Aramco's August contract price (CP) on a fob basis, while deliveries to north Vietnam in August were at \$95/t premiums to the August CP on a cfr Haiphong basis.

■ China's domestic prices were mostly stable owing to limited trade. The Pearl River Delta index (PRD) for south China was steady, settling at 5,414 yuan/t (\$799/t) during 1-12 August, supported by relatively low inventories, although consumption continued to be reduced during the summer months.

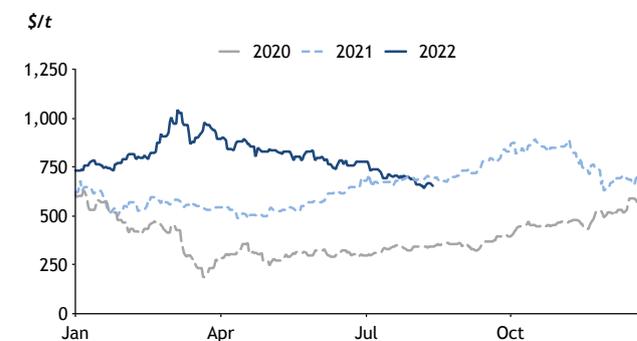
Propane Argus Far East index



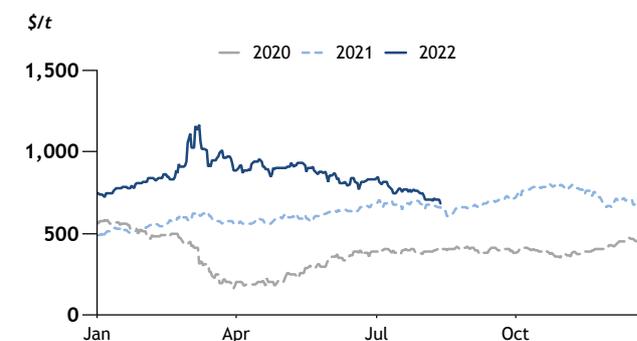
Propane Argus Far East Index differential to NWE



Butane Argus Far East Index



Naphtha c+f Japan



## AMERICAS PROPANE

■ US Gulf coast buying interest remained weak in early August owing to shipping delays at the Panama Canal and length in the Asian market, with spot terminal fee discussions just above cancellation levels. Mont Belvieu LST propane prices fell by 2.125¢/USG to 109¢/USG (\$569.50/t) in the first half of August alongside declining crude prices.

■ Mont Belvieu prices relative to Nymex WTI crude fell to 48.5pc from 49.7pc. US propane stocks grew by 2.1mn bl to 65.6mn bl (5.29mn t) over the week to 5 August, putting inventories higher than those a year earlier for the first time since the week ending 27 May.

■ US midcontinent prices at the Conway hub rose by 1¢/USG to 108.625¢/USG, and firmed to a 0.5¢/USG discount to Mont Belvieu following news of a regional stockdraw in early August. Midcontinent stocks were affected by a shutdown at the 210,000 b/d Medford fractionator in Oklahoma.

■ Edmonton in-well propane prices in Alberta, western Canada, held steady at a 16¢/USG discount to US midcontinent Conway values as buying sentiment remained strong. This was owing to lacklustre offers as participants continued to stockpile ahead of heating season.

## AMERICAS ETHANE

■ Mont Belvieu EPC ethane prices on the US Gulf coast edged 0.25¢/USG lower to 59.75¢/USG (\$445/t) in the first half of August, tracking weather-driven declines in natural gas. Ethane's discount relative to Mont Belvieu propane narrowed to 49.375¢/USG from 51.125¢/USG.

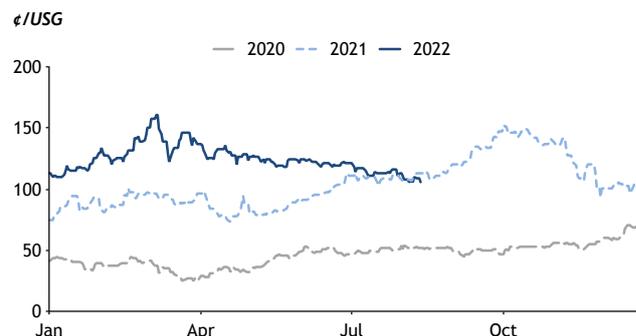
## AMERICAS BUTANE

■ Mont Belvieu EPC butane prices on the US Gulf coast fell to 121.875¢/USG (\$552/t) from 122.5¢/USG over 1-11 August. Butane's value relative to Nymex WTI crude also eased, to 54.3pc from 54.8pc. Mont Belvieu August-September spreads were steady, with August at a 0.625-0.75¢/USG discount during the first half of the month.

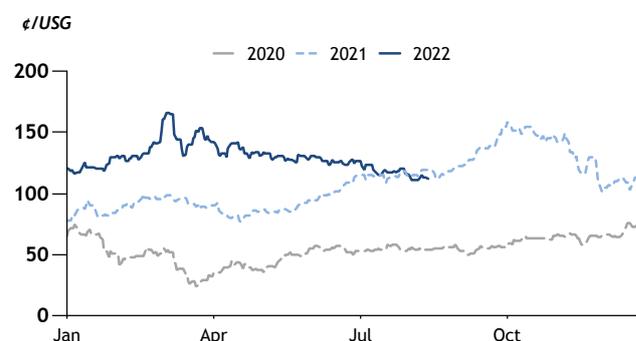
■ US midcontinent prices at the Conway hub in Kansas held steady at 120.875¢/USG in mid-August. But they firmed to a 1¢/USG discount to Mont Belvieu butane on expectations of tighter supply in the region going into the gasoline blending season that begins in September.

■ Edmonton butane prices in Alberta, Canada, held steady at 38pc of the calendar month average of Nymex WTI crude in early August.

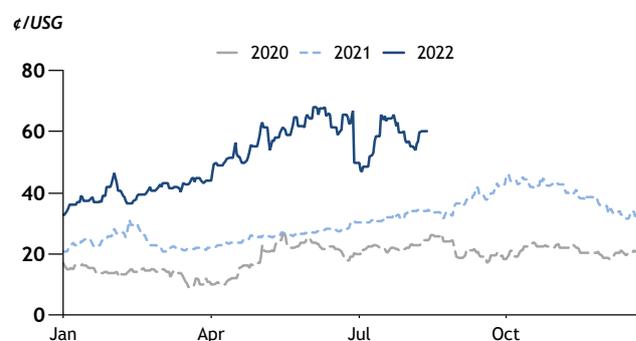
Propane Mont Belvieu non-LST



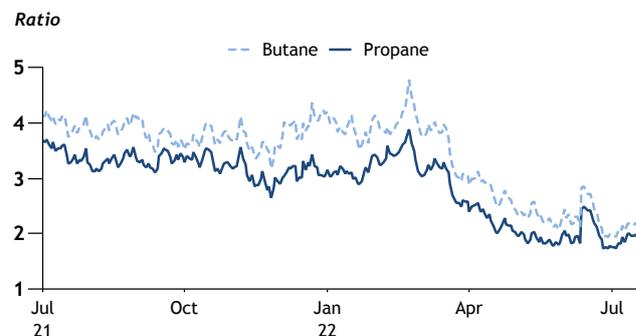
Propane US Gulf coast import



Ethane Mont Belvieu



Propane and butane ratios to ethane



## NGL ECONOMICS/SHIPPING

Ethylene plant total variable cash cost*					
	13 Jul	20 Jul	27 Jul	3 Aug	10 Aug
Purity ethane	22.56	27.30	26.12	23.95	25.74
Propane	34.30	32.59	31.91	32.13	31.26
N-Butane	27.83	24.89	24.03	23.61	23.31
Light naphtha	37.44	37.81	31.77	34.77	33.88
Gasoil	91.28	82.89	81.55	73.34	79.14

\*at Mont Belvieu, Texas

— Argus

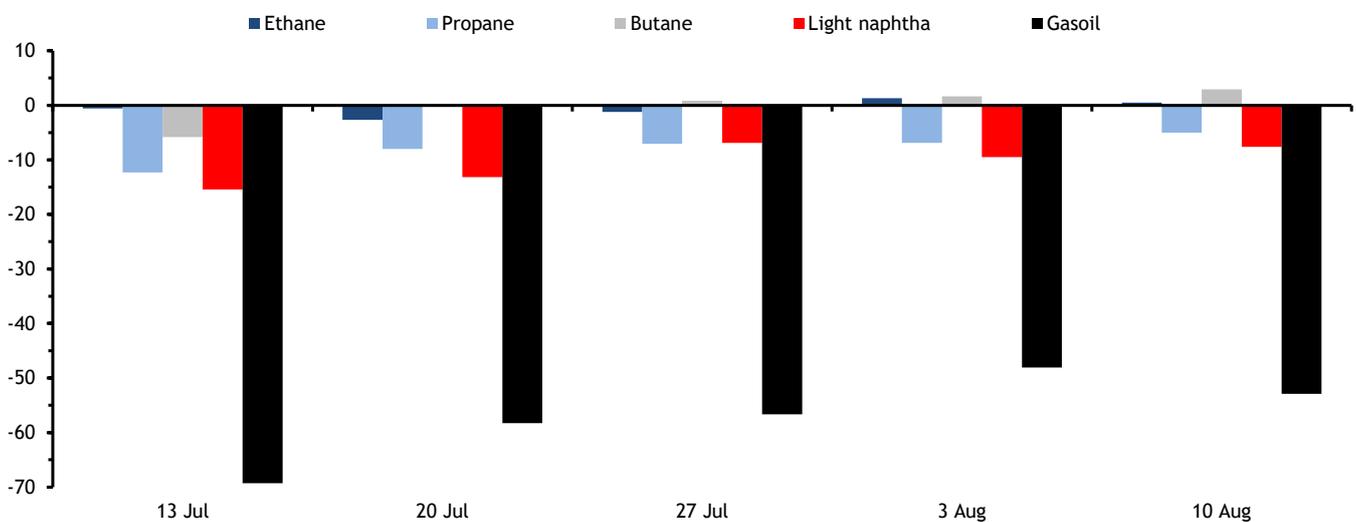
Ethylene plant gross margins* (see graph below)					
	13 Jul	20 Jul	27 Jul	3 Aug	10 Aug
Ethane	-0.56	-2.67	-1.24	1.30	0.51
Propane	-12.30	-7.97	-7.03	-6.88	-5.01
Butane	-5.83	-0.26	0.85	1.64	2.94
Light naphtha	-15.44	-13.18	-6.90	-9.52	-7.63
Gasoil	-69.28	-58.27	-56.68	-48.09	-52.89

\*at Mont Belvieu, Texas

— Argus

### US Ethylene plant gross margins (Mont Belvieu, Texas)

\$/lb of ethylene



## Shipping

Japanese shipping company NYK Line has ordered its fourth dual-fuel very large gas carrier (VLGC), which is due for delivery in 2025. The 86,700m<sup>3</sup> vessel, which will be able to run on LPG and very low-sulphur fuel oil, will be built by Kawasaki Heavy Industries (KHI).

NYK has separately launched a study with Norwegian fertilizer producer Yara into developing a new ammonia-fuelled ammonia gas carrier, as demand for the fuel grows.

## Shipping rates

VLGC rates on the Ras Tanura-Chiba route from the Mideast Gulf to Japan declined further in the first half of August as demand slipped and vessel availability strengthened. The rate closed at \$59/t on 12 August, down from \$61/t at the start of the month.

European coaster rates also declined in line with weaker demand. The Tees-ARA rate fell by \$1.50/t to \$66.25/t, while the Tees-Mohammedia rate fell \$2.25/t to \$80.75/t.

Shipping rates		\$/t
<b>Spot</b>		
44,000t	Ras Tanura-Chiba	59.00
44,000t	Houston-Chiba	95.25
44,000t	Houston-Flushing	52.00
1,800t	Tees-ARA	66.25
1,800t	Tees-Lisbon	125.50
4,000t	Tees-Mohammedia	80.75

— Argus International LPG

Shipping rates		\$/calendar month
<b>12-month time charter</b>		
84,000m <sup>3</sup>		1,000,000
38,000m <sup>3</sup>		810,000
35,000m <sup>3</sup>		705,000
3,500m <sup>3</sup> pressurised (west)	◀ ▶	255,000
3,500m <sup>3</sup> pressurised (east)	◀ ▶	235,000

— Gibsons

## DATA

PROPANE													
	Aug 21	Sep	Oct	Nov	Dec	Jan 22	Feb	Mar	Apr	May	Jun	Jul	Aug
Middle East \$/t													
Saudi Arabia	660.00	665.00	800.00	870.00	795.00	740.00	775.00	895.00	940.00	850.00	750.00	725.00	670.00
Kuwait	660.00	665.00	800.00	870.00	795.00	740.00	775.00	895.00	940.00	850.00	750.00	725.00	670.00
Mediterranean \$/t													
Algeria (Sonatrach)	620.00	640.00	808.00	820.00	730.00	700.00	705.00	830.00	870.00	730.00	730.00	700.00	660.00
Spot prices \$/t													
Large cargo cif ARA*	639.75	757.25	828.00	780.00	662.00	679.00	807.50	895.00	717.00	727.00	713.50	652.75	na
Large cargo cif Lavera	637.58	742.89	855.10	801.88	655.48	714.08	762.54	887.52	787.70	753.75	711.21	657.21	na
Large cargo Japan cfr	696.75	767.49	878.30	827.03	715.55	765.81	819.36	935.13	850.47	815.46	771.62	730.53	na
Large cargo India cfr	na	na	na	na	738.91	778.46	827.96	947.85	883.84	823.79	763.61	727.17	na
Large cargo Argus South China Index	700.32	766.95	883.11	834.76	724.23	773.86	824.58	939.52	857.21	823.54	773.53	733.93	na
Large cargo Argus Ningbo Index	698.32	768.28	880.08	829.88	718.84	768.93	821.08	936.04	851.64	817.59	773.10	732.88	na
Large cargo Argus Far East Index*	688.25	806.75	874.50	801.25	758.75	743.50	879.25	950.00	796.75	794.75	761.50	706.25	na
Asia spot premiums to CP \$/t													
Mideast Gulf	2.10	2.55	0.81	-9.43	-14.00	-20.24	-5.33	-3.39	-11.30	-16.47	-16.77	-15.45	na
India cfr	na	na	35.82	na	40.57	28.06	27.90	45.24	40.79	43.42	40.56	32.62	na
South China (pressurised)	72.33	66.91	63.86	63.00	60.95	63.76	67.33	69.83	70.00	70.00	70.00	68.65	na
Japan	29.85	41.26	43.77	-2.41	-25.87	15.53	18.64	42.48	-30.44	28.09	44.54	34.68	na
Mont Belvieu €/USG													
LST	111.31	128.98	144.56	126.00	103.71	116.64	131.51	143.82	130.79	123.34	121.52	114.69	na
Non-LST	110.75	129.24	144.58	125.83	103.04	116.32	130.22	142.48	129.29	122.59	121.32	114.51	na
Europe \$/t													
Coasters fob NWE	652.39	761.39	871.67	833.33	721.60	720.43	828.95	1,106.93	852.91	760.20	738.56	693.39	na
Barges fob NWE	620.55	763.99	956.31	990.31	896.19	885.95	848.04	1,410.97	1,289.11	907.00	787.15	736.43	na
Coasters fob Med	657.62	724.25	877.43	856.01	751.88	796.79	871.89	1,026.78	927.67	859.08	785.29	679.31	na

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

— all prices from Argus International LPG

Ethane													€/USG
	Jul 21	Aug	Sep	Oct	Nov	Dec	Jan 22	Feb	Mar	Apr	May	Jun	Jul
Mont Belvieu	31.37	33.56	38.99	43.46	40.24	33.63	37.64	39.97	42.71	50.94	59.96	64.70	na

Naphtha													\$/t
	Jul 21	Aug	Sep	Oct	Nov	Dec	Jan 22	Feb	Mar	Apr	May	Jun	Jul
Cargoes cif NWE	673.84	648.65	680.73	763.76	736.73	700.64	777.18	862.34	1,011.80	906.80	888.05	802.81	na
Cargoes c+f Japan	684.10	653.48	689.58	770.62	760.53	702.70	770.04	858.10	1,004.25	902.96	900.80	822.71	na

BUTANE													
	Aug 21	Sep	Oct	Nov	Dec	Jan 22	Feb	Mar	Apr	May	Jun	Jul	Aug
Middle East \$/t													
Saudi Arabia	655.00	665.00	795.00	830.00	750.00	710.00	775.00	920.00	960.00	860.00	750.00	725.00	660.00
Kuwait	655.00	665.00	795.00	830.00	750.00	710.00	775.00	920.00	960.00	860.00	750.00	725.00	660.00
Mediterranean \$/t													
Algeria (Sonatrach)	650.00	670.00	742.00	825.00	715.00	715.00	800.00	860.00	930.00	835.00	825.00	650.00	645.00
Spot prices \$/t													
Large cargo cif ARA*	683.00	709.00	836.50	760.75	712.25	785.75	840.75	973.25	791.00	822.50	703.25	641.25	na
Large cargo cif Lavera	630.55	686.13	784.23	766.13	677.69	765.10	823.73	926.09	836.17	847.54	712.56	607.85	na
Large cargo Japan cfr	691.18	763.89	852.49	793.36	688.96	757.34	831.36	949.96	861.32	818.15	773.26	723.33	na
Large cargo India cfr	na	na	na	na	712.76	770.66	839.96	962.68	894.90	826.48	764.86	719.97	na
Large cargo Argus South China Index	694.75	763.36	857.30	801.10	697.64	765.38	836.58	954.35	868.06	826.22	775.17	726.73	na
Large cargo Argus Ningbo Index	692.75	764.69	854.27	796.21	692.25	760.45	833.08	950.87	862.49	820.28	774.74	725.68	na
Large cargo Argus Far East Index*	685.25	797.75	856.50	767.25	722.75	733.50	904.25	963.00	804.75	791.75	763.50	695.25	na
Asia spot premiums to CP \$/t													
Mideast Gulf	2.10	2.55	0.81	-9.43	-14.00	-20.24	-5.33	-3.39	-11.30	-16.47	-16.77	-15.45	na
India west coast cfr	28.52	73.86	na	na	na	na	na	na	na	na	na	na	na
India cfr	na	na	35.82	na	39.71	28.06	28.18	45.24	40.37	43.42	40.56	32.62	na
South China (pressurised)	72.33	66.45	61.00	63.00	60.95	63.76	67.11	69.83	70.00	70.00	70.00	68.65	na
Japan	29.71	42.08	35.58	2.17	-14.87	17.66	21.03	37.52	-31.29	28.25	45.58	34.13	na
Mont Belvieu €/USG													
LST	129.63	146.35	164.83	151.12	133.30	153.36	154.78	167.67	141.63	127.55	136.99	114.24	na
Non-LST	130.64	147.26	161.74	147.61	127.25	150.76	153.12	172.62	155.75	150.88	144.55	128.30	na
Europe \$/t													
Coasters fob NWE	669.11	668.70	834.20	808.69	712.63	889.68	876.76	1,045.37	929.47	910.88	788.00	625.60	na
Barges fob NWE	640.36	695.98	860.58	784.94	710.74	810.26	884.76	1,054.12	918.42	828.88	689.50	604.82	na
Coasters fob Med	659.00	688.57	873.00	877.48	815.73	921.56	929.55	971.59	945.58	951.81	798.65	658.76	na

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

— all prices from Argus International LPG

As of 5 July 2022, the Large cargo cfr East China and cfr South China spot prices have been replaced with Argus' Ningbo Index and South China Index, respectively. The now defunct East China, South China and Taiwan spot premiums to CP have also been removed.

## DATA

Chinese domestic prices												Yuan/t	
	Jul 21	Aug	Sep	Oct	Nov	Dec	Jan 22	Feb	Mar	Apr	May	Jun	Jul
<b>East China terminal</b>													
Ningbo ex terminal	4,696	4,838	5,136	6,288	5,831	5,209	na	5,903	6,863	6,450	6,350	6,050	5,758
Wenzhou ex terminal	4,696	4,846	5,147	6,290	5,857	5,209	na	5,922	6,864	6,450	6,350	6,050	5,758
Taicang ex terminal	4,733	4,816	5,245	6,419	6,040	5,470	na	5,956	6,876	6,556	6,392	6,098	5,853
Shanghai ex terminal	4,592	4,814	5,100	6,286	5,826	5,161	na	5,891	6,790	6,172	6,303	6,098	5,763
Zhangjiagang ex terminal	4,733	4,820	5,245	6,419	6,040	5,470	na	5,956	6,876	6,556	6,392	6,098	5,853
Fujian ex terminal	4,766	4,857	5,198	6,360	6,148	5,495	na	5,972	6,660	6,294	6,351	5,924	5,748
<b>East China refinery</b>													
Shanghai ex refinery	4,327	4,580	4,855	6,038	5,523	4,820	na	5,338	6,505	5,117	5,597	5,899	5,555
Zhenhai ex refinery	4,401	4,763	4,970	6,100	5,496	4,848	na	5,588	6,590	5,961	6,014	5,869	5,485
Yangzi ex refinery	4,469	4,792	5,124	6,116	5,549	5,072	na	5,678	6,702	6,188	6,233	6,017	5,745
Fujian ex refinery	4,452	4,717	5,090	6,228	5,968	5,396	na	5,865	6,616	6,252	6,311	5,871	5,792
Gaoqiao ex refinery	4,320	4,580	4,855	6,036	5,561	4,818	na	5,338	6,505	5,117	5,589	5,899	5,615
<b>South China terminal</b>													
Zhuhai ex terminal	4,564	4,743	5,124	6,319	6,022	5,362	na	5,912	6,954	6,362	6,390	5,892	5,619
Shenzhen ex terminal	4,573	4,764	5,128	6,334	6,040	5,395	na	5,964	6,984	6,402	6,410	5,902	5,646
Raoping ex terminal	4,603	4,812	5,158	6,314	6,104	5,466	na	5,934	6,886	6,442	6,432	5,897	5,695
Nansha ex terminal	4,571	4,760	5,128	6,332	6,034	5,392	na	5,964	6,984	6,402	6,409	5,902	5,643
Shantou ex terminal	4,603	4,812	5,158	6,314	6,104	5,466	na	5,934	6,886	6,442	6,432	5,897	5,695
Yangjiang ex terminal	4,598	4,717	5,097	6,303	5,931	5,292	na	5,994	6,881	6,316	6,434	5,829	5,538
<b>South China refinery</b>													
Maoming ex refinery	4,521	4,596	4,973	6,109	5,847	5,141	na	5,800	6,719	6,191	6,312	5,717	5,356
Guangzhou ex refinery	4,449	4,685	5,025	6,168	5,942	5,276	na	5,750	6,890	6,283	6,286	5,778	5,534
<b>Northeast China refinery</b>													
Daqing ex refinery	4,201	4,668	4,818	6,438	5,333	5,020	na	6,088	6,252	5,538	5,950	6,380	5,836
Dalian ex refinery	4,116	4,581	4,785	6,247	5,054	4,808	na	5,797	6,111	5,428	5,956	6,328	5,958
<b>Northwest China refinery</b>													
Urumqi ex refinery	3,196	3,573	3,735	4,575	4,213	3,575	na	4,575	4,975	4,764	5,037	4,814	4,323
<b>Inland China refinery</b>													
Lanzhou ex refinery	na	na	na	na	na	na	na	na	na	356	na	na	na
Yan-An ex refinery	4,196	4,646	4,848	6,038	5,079	4,676	na	5,404	6,308	5,968	6,056	5,824	5,556

— all prices from Argus International LPG



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