

MARKET OVERVIEW

US Gulf coke supply declines in near term

The fob US Gulf coast 6.5pc sulphur coke price inched up on the week as the effects of a winter storm in late December squeezed spot supply, while a decrease in freight rates lent support.

Spot high-sulphur coke supply in the first quarter - which was already tight prior to the Christmas and New Year holidays - was further strained by a cold snap that disrupted some US Gulf coast refineries' operations. One refiner that received requests for prompt volumes this week said it was sold out for the first quarter, but that if it were to have spot volume to sell, offer prices would likely be higher than the mid-to-high \$120s/t fob.

At least one January loading cargo will be loaded with less coke, while others will have laycans delayed, market participants said.

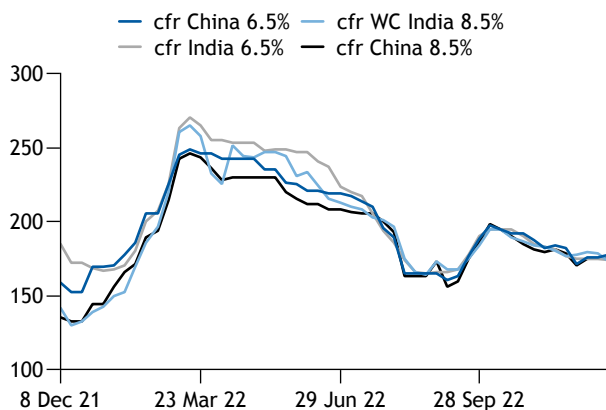
Freight rates from the US Gulf coast to main coke-buying countries fell on the week, further propping up high-sulphur coke pricing on an fob basis, despite a lack of trades heard in the past week because many market participants were on holiday.

Turkey

Prices for imported 5.5pc sulphur dry-basis coke were un-

Asia-Pacific high-sulphur prices

\$/t



Petroleum coke fuel-grade assessments							\$/t
	HGI	Weekly Price	±	Four-week avg	±	Dec month index	±
Atlantic basin							
fob US Gulf coast 4.5% sulphur	40	148.50	0.00	147.13	-0.62	146.667	-6.33
fob US Gulf coast 6.5% sulphur	40	128.50	+1.00	126.63	-0.62	126.000	-11.80
cfr Turkey 5.5% db sulphur	50-60	178.50	0.00	175.75	-1.00	174.833	-11.07
Sulphur adjustment							
US Gulf coast, per 0.1%		1.00	-0.05	1.03	0.00		
Pacific basin							
fob US west coast <2.0% sulphur	45	227.50	0.00	226.88	+1.88	226.667	-15.63
fob US west coast 3.0% sulphur	45	188.50	0.00	188.38	-0.12	188.333	-1.77
fob US west coast 4.5% sulphur	45	165.00	0.00	164.13	+0.25	163.833	-2.37
cfr China <2.0% sulphur	45	267.50	0.00	266.88	+0.63	266.667	-17.83
cfr China 3.0% sulphur	45	230.00	0.00	229.25	0.00	229.000	-1.60
cfr China 6.5% sulphur	40	177.50	+1.50	175.25	-1.13	174.500	-10.90
cfr China 8.5% sulphur	70	175.00	0.00	173.75	-0.88	173.333	-7.57
cfr India 6.5% sulphur	40	173.50	-1.00	174.50	-0.75	174.833	-8.27
cfr WC India 8.5% sulphur	70	173.00	-5.50	177.00	-0.88	178.333	-3.67

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Fuel-grade coke calendar month indexes: Jan					\$/t	
	HGI	4 Jan	11 Jan	18 Jan	25 Jan	Avg
fob US Gulf coast						
4.5% sulphur	40	148.50				
6.5% sulphur	40	128.50				
cfr Turkey						
5.5% db sulphur	50-60	178.50				
fob US west coast						
<2.0% sulphur	45	227.50				
3.0% sulphur	45	188.50				
4.5% sulphur	45	165.00				
cfr India						
6.5% sulphur	40	173.50				
8.5% sulphur, WC	70	173.00				
cfr China						
<2.0% sulphur	45	267.50				
3.0% sulphur	45	230.00				
6.5% sulphur	40	177.50				
8.5% sulphur	70	175.00				

Calculated coke indexes: Jan					\$/t	
	HGI	4 Jan	11 Jan	18 Jan	25 Jan	Avg
Delivered NWE-ARA						
4.5% sulphur	40	171.74				
6.5% sulphur	40	151.74				
Delivered Brazil						
4.5% sulphur	40	171.46				
6.5% sulphur	40	151.46				
Delivered Turkey						
6.5% sulphur	40	156.41				
Delivered India						
4.5% sulphur	40	199.68				
Delivered China						
4.5% sulphur	40	204.14				
Delivered Japan						
3.0% sulphur	45	209.11				
4.5% sulphur	45	185.61				

Prices calculated by adding or subtracting relevant fob petroleum coke price to freight rate.

changed on a lack of new offers and trades, as most cement plants in Turkey focus on covering their needs from domestic refiners.

One Turkish cement plant was in the market for term supply of mid- and high-sulphur coke this week. But some sellers doubt the company is likely to actually conclude any term contracts this month owing to a slow construction season and an unclear outlook for the Turkish economy ahead of presidential elections in June 2023. The same buyer recently purchased some high-quality coal at a competitive price from a local trader.

Petroleum coke calculated fuel-grade prices							\$/t
	HGI	Weekly Price	±	Four-week avg	±	Dec month index	±
Atlantic basin							
del ARA 4.5% sulphur	40	171.74	-1.40	170.20	-0.34	169.680	-6.45
del ARA 6.5% sulphur	40	151.74	-0.40	149.70	-0.34	149.013	-11.91
del Brazil 4.5% sulphur	40	171.46	-1.52	170.44	-0.61	170.097	-6.20
del Brazil 6.5% sulphur	40	151.46	-0.52	149.94	-0.61	149.430	-11.67
del Turkey 6.5% sulphur	40	156.41	-0.97	154.46	-0.31	153.813	-11.82
Pacific basin							
del Japan 3.0% sulphur	45	209.11	-0.78	209.85	-0.80	210.093	-5.67
del Japan 4.5% sulphur	45	185.61	-0.78	185.60	-0.43	185.593	-6.27
del China 4.5% sulphur	40	204.14	-3.04	201.31	-0.02	200.367	-6.72
del India 4.5% sulphur	40	199.68	-2.69	197.35	-0.19	196.573	-6.78

Prices calculated by adding or subtracting relevant fob petroleum coke price to freight rate.

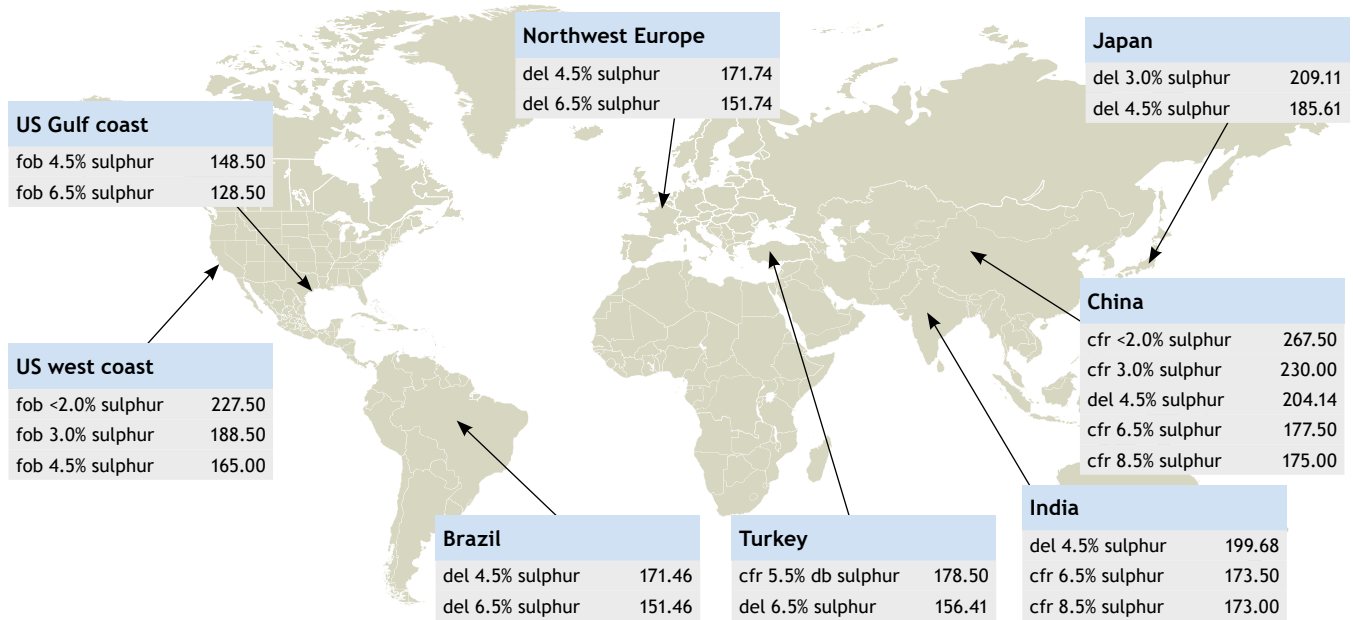
Coke freight rates, week of 4 Jan				\$/t
	Weekly average	±	Four-week average	
Supramax				
USGC to ARA	23.24	-1.40	23.09	
Venezuela to ARA	21.58	-1.79	21.70	
USGC to Turkey	27.91	-1.97	27.85	
USGC to Brazil	22.96	-1.52	23.27	
USGC to China	55.64	-3.04	54.38	
USGC to EC India	51.18	-2.69	50.35	
USWC to China	30.44	-2.32	32.02	
EC Saudi Arabia to WC India	14.74	+0.06	14.30	
Panamax				
USWC to Japan	20.61	-0.78	21.36	

And a Turkish refiner issued a tender this week for its monthly production. According to cement makers, the volume could be concluded as low as the mid-to-high \$150s/t, while in December Turkey's two refiners concluded trades at \$160-\$165/t cfr. This may be because the coke being sold this month has higher sulphur content – at around 7pc compared with 4-5pc in prior months – so the buyer would have to blend this coke with low-sulphur coal to meet emissions requirements.

New offers of Russian coal were \$155-\$158/t cfr Turkey at the start of the month, but no new trades were done since

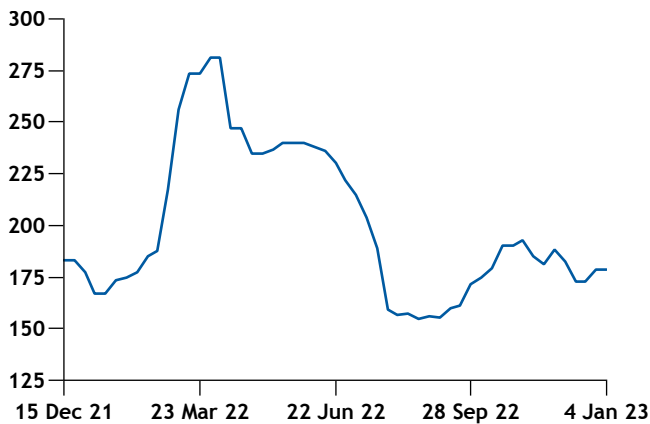
Weekly petroleum coke price snapshot

\$/t



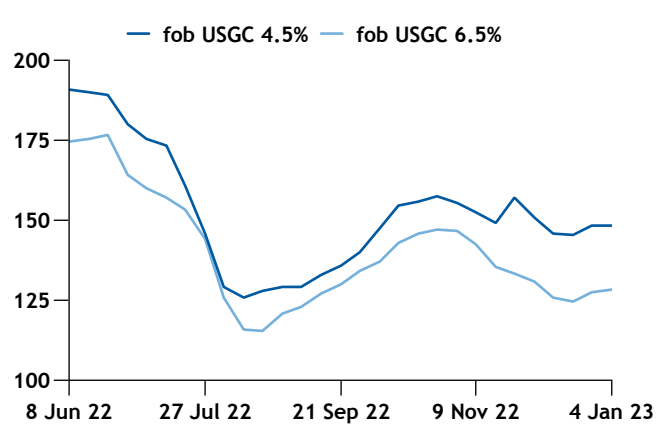
cfr Turkey mid-sulphur price

\$/t



Benchmark fob USGC prices

\$/t



late December. And it is still possible to get a reasonable price for imported coal that is already discharged in Turkish ports, according to Turkish buyers.

India

In India, delivered prices of coke eased on the week as a result of limited demand after the new year holidays, with some sellers willing to lower offers.

A January-loading Supramax cargo of US 6.5pc sulphur coke was offered in the low-to-mid \$170s/t cfr on the west coast of

India, while a bid for another vessel loading in the same month was heard at \$170/t on the west coast. The market still had at least two unsold January-loading US coke cargoes.

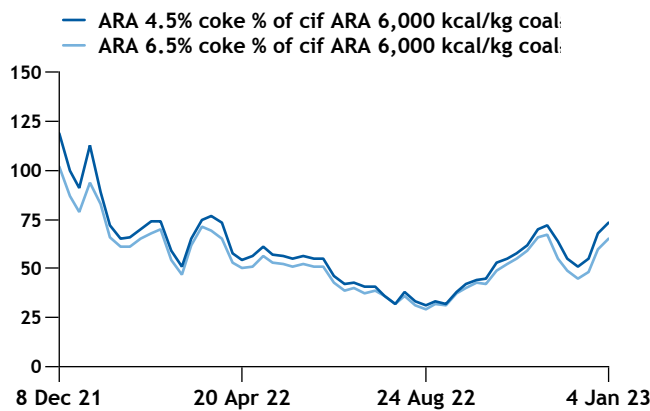
An end-January loading Supramax cargo of Saudi Arabian 8.5pc sulphur coke traded around \$172/t cfr on the west coast of India today, a significantly lower level than where similar coke has been offered recently. An end-January loading Supramax cargo of this high-sulphur coke was offered last week at around \$180/t cfr on the east coast of India, with no corresponding bids.

Coke-to-coal calorific comparisons						
		Coal	4.5% coke	5.5% db	6.5% coke	8.5% coke
del ARA	\$/mn btu	7.590	5.576	-	4.927	-
	% of coal	-	73	-	65	-
del India	\$/mn btu	8.038	-	-	5.633	5.617
	% of coal	-	-	-	70	70
del Turkey	\$/mn btu	6.454	-	5.796	5.078	-
	% of coal	-	-	90	79	-
fob USGC	\$/mn btu	6.086	4.822	-	4.172	-
	% of coal	-	79	-	69	-

Coal-implied forward curves							\$/t
2Q23	3Q23	4Q23	1Q24	2024	2025	2026	
fob USGC 4.5% petroleum coke							
148.50	141.59	137.77		139.38	119.50		
fob USGC 6.5% petroleum coke							
128.50	122.52	119.22		120.61	103.40		
del ARA 4.5% petroleum coke							
171.74	168.21	169.04	168.31	160.58	150.97	141.36	
del ARA 6.5% petroleum coke							
151.74	148.62	149.35	148.71	141.88	133.39	124.90	
cfr India 6.5% petroleum coke							
173.50	158.85	153.62	150.43	148.66	139.72	130.78	

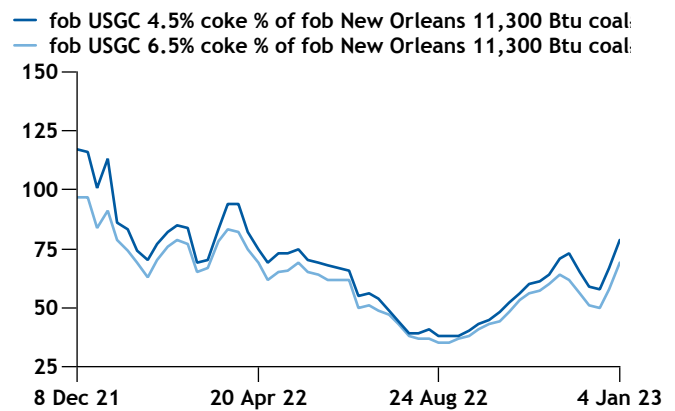
del ARA coke percent of coal

%



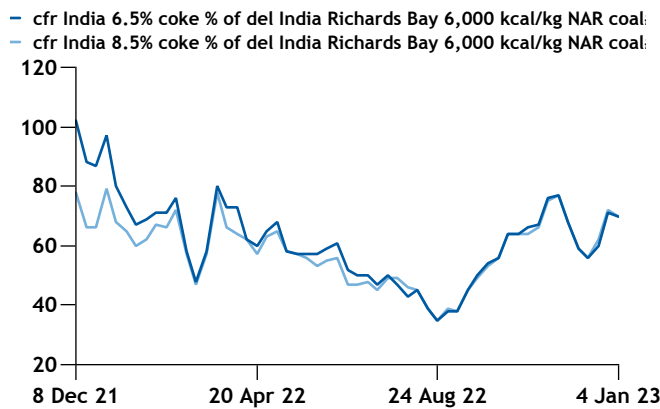
fob USGC coke percent of coal

%



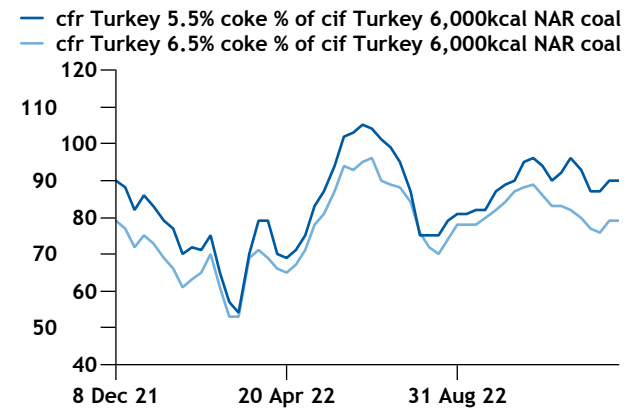
del India coke percent of coal

%



del Turkey coke percent of coal

%



At least two cement makers were seeking January/February-loading coke cargoes but were indicatively bidding in the low-\$170s/t cfr west coast.

Many Indian buyers were cautious in booking February- or March-arrival cargoes, as companies must ensure lower fuel

inventory around the fiscal year closing in March.

Meanwhile, cement sales were recovering, but many producers were still sitting on unusually high clinker inventory. Many cement units have clinker stocks of more than 40 days, almost double normal levels. Cement plants produce clinker in

kilns and subsequently grind it to produce cement.

China

Chinese high-sulphur coke demand was weaker over the past week as the lunar new year holiday approaches and domestic coal prices dropped.

Bids for US 6.5pc sulphur coke were heard dropping to \$170/t cfr but this level was far from prices offered, as firm fob prices and freight rates kept net-forwards at \$185/t cfr or more. Saudi Arabia’s 8.5pc sulphur coke was heard offered at about \$180/t cfr, but it is hard for sellers to achieve these levels, according to a domestic trader.

China’s domestic market was quiet, and many traders were on the sidelines this week as domestic coal prices dropped sharply over the last two weeks, combined with surging Covid-19 cases after the easing of Covid-19 measures.

Offers of NAR 5,500 kcal/kg coal were at 1,190-1,210 yuan/t (\$172.90-\$177.30/t) fob north China ports, down from Yn1,220-1,240/t a week earlier and Yn1,300-1,330/t on 21 December. This made domestic coke traders cautious about booking any

fresh cargoes, especially with the lunar new year approaching, when many factories shut down. The week-long holiday starts on 21 January.

China could be moving to [loosen its informal ban on imports of Australian coal](#), potentially restarting trade flows for the first time in over two years. Some market participants believed the potential lifting of Australia coal will weigh on fuel-grade coke demand, as Australia was a significant coal supplier to China before the ban.

The National Climate Center (NCC) forecast that temperatures in most parts of China will be 1-2°C higher than normal during the second half of January. This suggests fuel demand from power plants before the lunar new year holidays could be limited.

Low-sulphur coke demand is also likely to be stagnant before the holidays, as some glassmakers have already restocked for their use during those days.

A US west coast refiner was understood to have sold a January-loading cargo of coke with 1.5pc sulphur at about \$300/t cfr or roughly \$250/t fob over the past week.

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NEWS

COKE

US coke output to rise this year

Overall US petroleum coke production is expected to rise this year but will skew towards high-sulphur coke output, potentially offering support for low- and mid-sulphur coke pricing.

US coke production through September totaled 30.12mn t, according to the most recent Energy Information Administration data. And with monthly output averaging 3.35mn t, the US may finish out 2022 with 40.2mn t produced, an increase of 7pc from 2021 totals and the highest production since 2019. Refinery rates are expected to remain elevated in 2023, market participants said.

Full-year output in 2023 is poised to increase, with Valero on pace to complete a 55,000 b/d [coker expansion project in the first half](#) at its 335,000 b/d Port Arthur, Texas, refinery. This will add about 750,000t in annual coking capacity, according to estimates from Argus Consulting, a division of Argus Media. The group's forecasts and analyses are separate and independent of Argus' news and price assessment business.

The Valero project also will increase the refinery's heavy sour crude processing capacity, suggesting that the coker expansion may yield high-sulphur coke.

Other factors are expected to continue to increase the proportion of high-sulphur coke production. These include a shift to [heavier crude slates](#) at US Gulf coast refineries caused by changing feedstock availability and widening heavy sour-light sweet crude spreads.

A number of refineries that have historically been mainstays of US Gulf coast mid-sulphur coke output have swung to higher sulphur coke production, with one of the most recent being Valero's 215,000 b/d refinery in St Charles, Louisiana. St Charles is not anticipated to return to its previous production specifications any time soon, although the refinery is continuing to produce and segregate some mid-sulphur coke, market participants said.

ExxonMobil's 502,500 b/d refinery in Baton Rouge, Louisiana, may also produce higher sulphur coke [following a project to expand the refinery's crude slate](#), although the shift may not happen until 2024.

Chevron's clearance to [resume importing Venezuelan crude](#) provided a glimmer of hope that some US Gulf coast refineries may begin producing mid-sulphur coke once again. Some US Gulf coast refineries, like Phillips 66's 247,000 b/d refinery

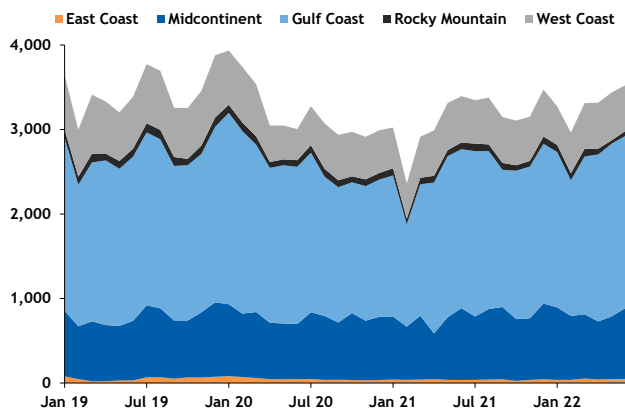
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EIA weekly refined products data					
	23-Dec	16-Dec	± %	Year ago	± %
Refinery usage					
Refinery inputs '000 b/d	16,586	16,383	1.2	16,262	2.0
Refinery utilisation %	92	91	1.2	90	2.6
Products supplied '000 b/d					
Total products	22,822	20,924	9.1	22,218	2.7
Gasoline	9,327	8,714	7.0	9,724	-4.1
Jet	1,520	1,712	-11.2	1,590	-4.4
Distillate fuel	3,880	4,015	-3.4	4,051	-4.2

US coke production

'000t



in Sweeny, Texas, produced mid-sulphur for years based on a Venezuelan-heavy crude slate, but have shifted to high-sulphur production after switching away from the Latin American supplies.

But Chevron’s volumes from its joint venture in Venezuela have dwindled and its infrastructure there is in need of investment, leaving chances slim that crude from that country will increase mid-sulphur coke production any time soon.

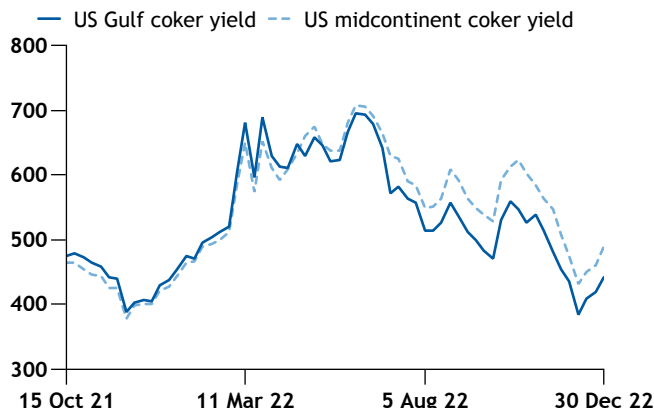
Coking capacity to decline after 2023

This year could be the last to post year-on-year increases in US coke output, with two refineries slated for closure by 2024. LyondellBasell’s 268,000 b/d Houston refinery, which has in recent years produced high-sulphur coke, is scheduled to close by 31 December 2023, unless a buyer steps up to purchase the plant.

And one of the last remaining producers of 1.5-2pc sulphur coke in the country, Phillips 66’s 120,000 b/d Rodeo refinery near San Francisco, California, will cease petroleum refining by early 2024 ahead of its shift to renewable fuels production, the company said. Phillips 66 will retain its permit to operate

US Gulf and midcontinent coker yields

\$/st



the refinery’s 51,000 b/d delayed coker for the possibility of future use, although the unit will be idled, according to Contra Costa County’s final environmental impact report.

By Delaney Ramirez

China weakness may change coke trade flows

The Chinese market has dominated seaborne coke trade over much of the last three years, but that could be set to change in 2023.

China’s economy has faltered in recent months, particularly for key coke-consuming industries like glass, cement and metals, with real estate investment slowing. Stimulus measures and the relaxation of the country’s zero-Covid policy could spur new growth, but the outlook remains muddier than in recent years.

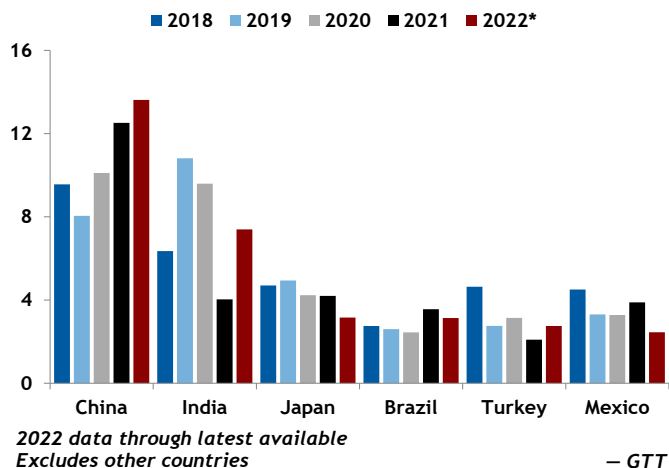
Weakening petroleum coke demand in China in 2023 could redirect more coke to other countries, particularly India. But coke could have more competition from coal than it did for much of last year, after disruption to the global energy markets, especially from the Russia-Ukraine war, led to elevated coal prices in many markets.

At the same time, US Gulf high-sulphur coke production is expected to grow in the coming year, further pressuring sellers to find more buyers outside of China.

Currently, China remains the biggest green coke importer, having taken around 13.62mn t, or just under 30pc of the world’s seaborne green coke, in January-November, according to data compiled by Global Trade Tracker (GTT). This compares with 11.73mn t in January-November 2021, or a little under 28pc. Many countries have not yet reported November imports, which could adjust its market share for 2022. But

Top global green coke importers

mn t



China certainly dominated global demand in November, as its monthly imports reached more than 1.94mn t, a record high monthly total for any country, surpassing India’s 1.9mn t in August 2016.

For full-year 2021, China took 26.8pc of global seaborne coke imports at 12.52mn t, a far higher proportion than any country, with a number of countries all splitting comparable market share. Japan took 9pc with 4.2mn t, India 8.6pc with 4mn t, Mexico 8.3pc with 3.9mn t and Brazil took 7.6pc with 3.6mn t. Turkey had the next largest market share at 4.5pc with 2.1mn t.

This was a change from 2020, when China was the largest importer but was followed much more closely by India. China took 20.6pc of 2020’s seaborne coke imports at 10.1mn t, with India at its heels taking 9.6mn t, or 19.5pc. And in 2019, China took 15.7pc at 8mn t, behind India at 21.1pc with 10.8mn t. If Chinese demand returns to 2019 levels, India would be the most likely destination for sellers to target.

India had previously dominated the market for a period as its large cement industry appreciates the high-calorific value of fuel-grade high-sulphur petroleum coke. But the Covid-19 pandemic turned market fundamentals on their head, driving coke to a wide premium to coal, which quickly stifled Indian demand in the second half of 2020 and 2021. When coke supply recovery and historically high coal prices revived coke’s discount in 2022, Indian demand surged back. Imports to the country more than doubled on the year in the first 10 months of 2022, reaching 7.4mn t, or 16.1pc of total seaborne market share – up by roughly 10pc from a year earlier.

Indian buyers will likely absorb much of the coke that can no longer find a home in the Chinese market if China’s buying falls back from recent record levels. But only if the discount to coal remains favourable. Availability of cheap Russian coal – as well as the possible decline in prices for other coal origins from their record highs – may also pressure demand for coke in Asia-Pacific.

By Alexander Makhlay and Lauren Masterson

Venezuela coke’s return may cause oversupply

The sudden return of Venezuelan petroleum coke exports in the second-quarter of 2022 came at an opportune time, as record high coal prices left a lot of room for additional coke supply. But potential further increases in Venezuelan coke availability, as well as an uncertain coke demand outlook, could challenge US and other high-sulphur coke sellers in 2023.

Venezuelan coke had been largely unavailable in recent years following US sanctions and deterioration of the country’s export infrastructure. But upgrades to facilities at the port of Jose over the past year have resulted in a surge of exports, with much of it landing in China. China received 1.81mn t of Venezuelan coke in 2022, up by more than tenfold from 151,500t in 2021, according to customs data compiled by Global Trade Tracker (GTT). And the pace of these imports has been accelerating recently, with a record 404,200t delivered to China in November.

India has also been buying this coke, but in much smaller volumes, receiving only 333,600t in January-October, the latest data available. If China’s appetite declines, as seems likely considering its total import volumes in 2022 have been record-breaking, Venezuelan sellers may need to increase the discounts offered to Indian buyers against prevailing US coke prices, which have ranged between \$5-20/t.

Turkey has become the second-largest market behind China for Venezuelan coke. Turkey received 479,500t of Venezuelan coke imports in the first 10 months of 2022, or 17.4pc of all global import volumes from Venezuela reported in GTT data. Turkish cement plants took more coke overall last year amid record high coal prices and uncertainty surrounding Russian coal supplies. Turkey’s coke imports increased by more than half in January-October, reaching 2.75mn t. The country’s cement sector had moved away from coke in 2021 for similar reasons as India, when coke discounts to coal evaporated.

But although Turkish buyers are now looking to coke as the least expensive fuel, opportunities for sellers to replace Chinese market share here may be slim, on turmoil in the Turkish

economy and a sharp depreciation of its currency against the US dollar. And cement plant utilisation rates in the country are likely to soften on unfavourable market conditions, rising raw material and energy costs, and lower demand for cement from the construction sector.

Other coke exporters boost supplies

The US – the largest green coke exporter – increased its share of the global seaborne market by 2.6 percentage points on the year to 71.1pc, exporting 28.28mn t in the first 10 months of 2022, even as competition from Venezuela and other producers increased.

In addition to Venezuela, which exported 2.32mn t in January-October against 184,000t a year before, according to GTT data from importing countries, Russia and Saudi Arabia also substantially increased shipments in 2022. Russian coke shipments – mainly to China – rose by 48.2pc on the year to 1.65mn t in January-October, while Saudi Arabia exported 4.11mn t, up by 21pc over the same period. Spain also increased exports to 2.44mn t in the first 10 months, up by 26.9pc on the year.

Considering that Venezuela’s improved export operations only began in the second quarter of 2022 and exports have surged in recent weeks, the Latin American country’s total seaborne volume is likely to continue to climb in 2023. There are also potential signs of the US softening sanctions on the country, although this is not yet determined.

A continued rise in exports from Russia will depend on how much pressure sanctions against the country’s oil industry ultimately

inflict on its refining industry, as well as the prospects for demand for its fuels in Asia-Pacific.

By Alexander Makhlay and Lauren Masterson

Turkey imported less coke in November

Turkey’s imports of green petroleum coke fell in November from October on lower demand as consumers prefer ending the year with reduced stockpiles.

An increase in coke prices during September-October and a drop in coal prices over the same period may have also limited supplies to the country.

Turkey’s total green coke imports fell to 230,600t in November, down by 25pc on the month, although this was flat on the year, according to data from Global Trade Tracker (GTT). The year-on-year stability still reflects relatively low demand as 2021 was a particularly weak year for Turkish demand. Year-to-date November shipments were up by 1.01mn t on the year at 2.98mn t. The US remained the key supplier to Turkey in January-November, but its share fell by over 5 percentage points to 71pc, while Venezuela’s market share tripled to almost 18pc.

In November, Turkey cut supplies from the US by almost 40pc on the month, but these increased by 7pc on the year to 160,600t. Turkish buyers likely reduced purchases from the US from October levels because European delivered coal prices started falling from \$400/t cif Amsterdam-Rotterdam-Antwerp on 5 September to below \$313/t on 3 October and into the \$260s/t in mid-October. At the same time, prices for US coke in Turkey rose from about \$155/t cfr to \$190/t cfr over the same period.

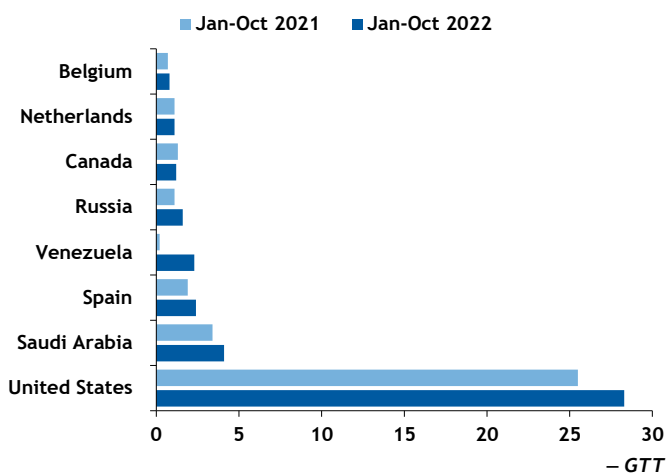
Shipments from Venezuela slightly increased on the month – from 43,700t in October to 45,000t in November and were up from zero a year prior. Most of these shipments went to traders which resell small volumes to cement makers after the fuel arrives and discharges at Turkish ports.

But Turkey took also imported 3,000t of coke classified as Mexican, likely indirect supplies from Venezuela, since Mexico typically consumes all of its coke domestically. A year prior, supplies reported from Mexico accounted for 22,100t.

Turkey took no imports of green coke from Russia in September-November, but imports of Russian coke totalled 7,000t in November 2021. Turkey also received 22,000t from Spain last month, according to GTT.

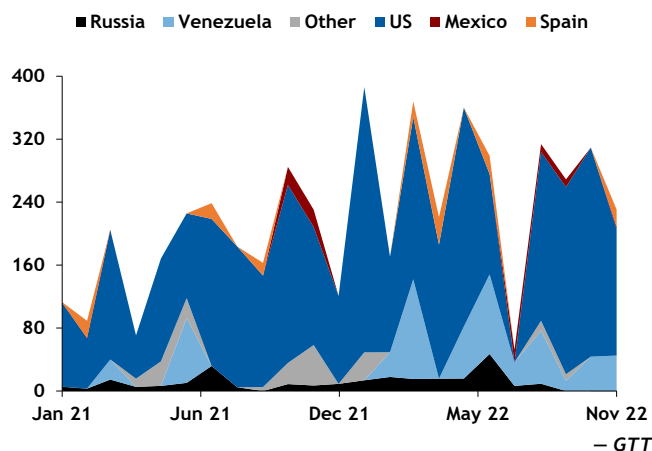
Turkey’s imports of calcined coke were at 160t in November – all from the Netherlands and the UK, compared with 11,150t, mainly from Brazil, in October. A year prior, Turkey re-

Top global green coke exporters mn t



Turkey green coke imports

'000t



ceived 220t of calcined coke from Germany, Austria and China.
By Alexander Makhlay

India's RIL, Nayara revise January coke prices

Indian private-sector refiner Reliance Industries (RIL) has marginally cut its January petroleum coke prices, while Russia's Rosneft-owned Nayara announced a token increase. Seaborne coke prices were largely flat during December.

RIL set its basic January price at 17,645 rupees/t (\$213/t), down by Rs166/t from December. Nayara revised its prices to Rs17,945/t, up by Rs34/t from last month.

The factory gate prices were effective 1 January, excluding local taxes and duties. RIL and Nayara had cut their December coke prices by up to 6pc from November.

RIL's basic price had hit a record high of Rs22,473/t in June 2022, reflecting high seaborne coke prices.

Nayara's decision to price its coke independent of RIL reflects changed market conditions, said a market participant. RIL cut sales in 2022 as it increased its coke gasification capacity.

RIL sold about 200,000 t/month in early 2021 after feeding its gasifiers, reducing this to 80,000-100,000 t/month by the end of 2021. For most of 2022 it sold 25,000-35,000 t/month on average. RIL also imported at least four cargoes from Saudi Arabia since August, adding to India's import requirements. Reduced availability from RIL has led to tighter supplies on India's west coast, creating increased demand for Nayara and other regional refiners.

Indian refiners typically follow an import parity pricing model for domestic supplies that includes the price of US Gulf

coast 6.5pc sulphur coke on a delivered India basis. Refiners announce prices on the first day of the month use the average delivered India price of the previous month as guidance, while adjusting for any currency exchange fluctuations.

Record-high fob prices and freight rates lifted the delivered India price of US 6.5pc sulphur coke to an all-time high of \$270/t in mid-March, following a surge in coal prices. Prices have been volatile in recent months and were last assessed at \$174.50/t on 22 December, down from \$176.50/t on 30 November. Offers of January-loading US 6.5pc sulphur coke were heard in the low \$170s/t cfr on India's west coast this week.

Cement stocks swell

Many Indian buyers are sitting on unusually high inventories as cement output and dispatches remained below expectations. Many cement units have clinker stocks of more than 40 days, almost double compared with normal levels. Cement plants produce clinker in kilns and subsequently grind it to produce cement.

Cement demand typically picks up after the July-September monsoon in India. October-December and January-March are historically marked by firm cement demand, with most cement producers posting their best sales during these periods.

But cement demand has been subdued even after the monsoon ended. The trend is likely because of an overall increase in construction costs because of higher prices of steel, cement and other inputs. Banks have also raised lending rates for home loans, weighing on real estate demand.

The slow loading and dispatch of cement is weighing on fuel purchase decision of cement producers. Many cement firms want to avoid February- and March-arrival cargoes to end the 2022-23 fiscal year ending 31 March with low fuel inventories.

By Ajay Modi

Japan's coke imports fell on year in November

Japan's petroleum coke imports fell by 32pc from a year earlier to 202,300t in November, data from the country's ministry of finance show.

Japan received 185,700t of coke from the US in November, down by 37pc compared with a year earlier. This outstripped an increase in Chinese supply that totalled 16,600t during the month, compared with only 3,600t in November 2021.

The country's coke users, including cement and steel makers, had slower production during the month. Cement output fell by 3.3pc on the year to 4.5mn t in November, according to

the Japan Cement Association. Steel production also dropped by 11pc from a year earlier to 7.2mn t in November.

Japan's coke import costs averaged \$321.04/t on a delivered basis for November, which compared with \$217.84/t a year earlier. The average yen-denominated import cost was ¥46,952/t, up by 89pc from the same month the prior year.

By *Reina Maeda*

Severe Covid reports in China 'concerning': WHO

The World Health Organisation (WHO) in mid-December said it is "very concerned" about rising reports of severe disease after China ended its zero-Covid policy.

The abrupt dismantling of China's once draconian travel and social distancing restrictions has led to a resurgence in infection cases. The Chinese government has stopped issuing national case totals since 25 December. But sources report that the virus has spread extremely rapidly, resulting in a decline in economic activity for commodities including petroleum coke as industries scale back work on employee absences.

The policy reversal initially led to a rise in mobility. But data from Chinese search engine Baidu show mobility has fallen sharply over the third week of December amid signs of a surge in infections in cities including Beijing and Shanghai, likely causing oil demand to stall.

Vaccination against Covid-19 is the best exit strategy for the country but the WHO said this is still lagging in China, particularly for vulnerable people.

"WHO is supporting China to focus its efforts on vaccinating people at the highest risk across the country," the agency's director-general Tedros Adhanom Ghebreyesus said on 21 December. But more detailed information on disease severity, hospital admissions and requirements for intensive care unit support from China is needed to make a comprehensive risk assessment of the situation on the ground, he added.

Despite rising Covid infections, China has set a target of returning daily passenger flight volumes to nearly 90pc of 2019 levels by the end of January as part of a three-stage plan, according to Chinese aviation portal Carnoc.

The US, along with Italy, Japan, Taiwan and India, recently announced they will require travelers from China to present [proof of a negative Covid-19 test](#).

The IEA forecasts a strong recovery in Chinese jet fuel demand this year. But Chinese oil firms were expected to export 400,000 b/d of jet fuel in November-December to balance the increase in jet fuel supplies with still weak demand.

The [World Bank has cut China's GDP](#) forecast for this year

to 2.7pc, citing the impact of Covid-19 as one of the main factors for the reduction.

Internationally, the number of weekly reported Covid-19 deaths has dropped by almost 90pc from their global peak. But Ghebreyesus warned there are still too many uncertainties to conclude that the pandemic is over.

COAL

China considers lifting Australian coal ban

China could be moving to loosen its informal ban on imports of Australian coal, potentially restarting trade flows for the first time in over two years.

China's main economic planning agency the NDRC has discussed the potential lifting of the unofficial ban, market participants said. Four major coal importers – China Energy Investment, Huaneng, Datang and Baowu Steel – could have been given permission to import Australian coal, they said.

The developments could not be confirmed. Details on an effective date for the trade to restart and annual import quotas have not yet been finalised, market participants said.

Potential trades will likely have to be concluded on a "point-to-point" basis, whereby consumers purchase Australian coal without relying on third-party intermediaries, some market participants said. This also indicates that potential buyers should not resell cargoes to other consumers.

China has unofficially banned Australian coal imports since late 2020 because of political tensions. Australia was a significant coal supplier to China before the ban, which has pushed Chinese buyers to purchase more coal from other origins such as Indonesia and Russia.

Australia and China agreed last month to hold further talks about resolving several trade disputes. That came after Chinese president Xi Jinping and Australian prime minister Anthony Albanese met at the G20 summit in Indonesia, in the first meeting between the two countries' top leaders in six years.

Chinese demand for Australian coal is likely to remain muted, even if the ban is lifted, because of recent volatility in Australian thermal coal prices, market participants said. This, together with the relatively long shipping times involved, will exacerbate the potential financial exposure for Chinese consumers, they added.

Australian thermal coal prices have been highly volatile as supplies have been curbed by weather-related disruptions surrounding recent La Nina events. European demand for

Australian coal has also increased following Russia's invasion of Ukraine in February 2022, which tightened gas supplies. The EU also banned Russian coal imports in August last year as part of wider sanctions against Russia.

The price arbitrage of Australian high calorific value (CV) NAR 5,500 kcal/kg and NAR 6,000 kcal/kg thermal coal is unlikely to be attractive to Chinese end users, as the NDRC capped the spot price for Chinese domestic NAR 5,500 kcal/kg thermal coal at 1,155 yuan/t (\$167.8/t) fob north China ports in May last year.

Australian high-ash NAR 5,500 kcal/kg coal prices hit a record high of \$287.15/t fob Newcastle on 11 March 2022, after touching an historical low of \$35.04/t on 4 September 2020, when global Covid-19 lockdowns and restrictions weighed on demand. *Argus* last assessed this market at \$133.56/t fob Newcastle on 30 December 2022.

Chinese enquiries have picked up for Australian NAR 5,100 kcal/kg coal because of its relatively attractive price differential, putting pressure on Indonesian mid-CV coal prices, some traders and Australian producers said. Others said Australian NAR 5,100 kcal/kg coal is being offered in a \$104-110/t fob Newcastle range. *Argus* last assessed Indonesian mid-CV GAR 5,000 kcal/kg coal prices at \$115.82/t fob Kalimantan on 30 December.

China imported 42.5mn t of Australian thermal coal in 2020, but this plummeted to 5.5mn t in 2021, Chinese customs data show.

By Siew Kuan Yong

China's industrial shutdowns curb coal demand

Some Chinese industrial coal consumers have suspended operations since November, as they grapple with higher operating costs and environmental restrictions during the high air pollution season over November-March.

The disruptions to industrial activity will likely weigh on Chinese coal consumption over the high-demand winter season, with residential household heating a key consumer of China's coal supplies.

Heavy industrial sectors such as cement and steel manufacturers across parts of north China provinces such as Shandong, Henan and Ningxia have been ordered to cease activity for more than 100 days. This move is aimed at providing stable coal supplies to the power sector and reducing air pollution during the winter season, Chinese market participants said.

The Gansu and Shaanxi provincial department of industry and information technology has instructed cement manufac-

COAL SPOTLIGHT

Domestic coal supplies to Indian utilities rise in Nov

turers to strictly follow a 100-day staggered production policy from 1 December to 10 March. Cement kilns are required to shut down for 100 days during the winter season under the 100-day staggered production policy. Production will then be raised in the spring season when heating demand starts to ease.

The seasonal lull in demand from the non-power sector weighed down offers for Chinese domestic NAR 5,500 kcal/kg coal to 1,250-1,260 yuan/t (\$179.30-180.73t) fob north China ports on 27 December, from Yn1,300-1,350/t at the end of November. But domestic coal supplies are under pressure as surging Covid-19 infections have exacerbated the shortage of mine workers and truck drivers, cushioning any potential sharp drop in prices, a Chinese trader said.

Overall power use by industrial consumers dropped by 1pc on the year to 478.9TWh in November, according to the China Electricity Council. Power use by the household and agricultural sectors in November rose by 4.2pc and 9.4pc on the year to 85.4TWh and 8.9TWh, respectively. Stocks at China's key coal transshipment ports of Qinhuangdao and Caofeidian [rose in the week to 28 December](#), as utility offtake dropped along with higher inbound deliveries.

Coal inventories at Qinhuangdao stood at 5.75mn t on 28 December, up from 5.01mn t a year earlier and 5.66mn t a week earlier, according to data from coal industry association the CCTD.

Inbound deliveries to Qinhuangdao edged up to 3.28mn t in the week to 28 December from 3.22mn t a week earlier. Utility offtake from Qinhuangdao fell from 3.22mn t a week earlier to 3.19mn t in the week 28 December, as slowing industrial activity weighed on power demand, which is mainly coal-fired.

China's cement and steel manufacturing sectors are key consumers of coal. Coal burn in the cement sector stood at 480mn t over January-November, down by 5.9pc on the year, according to data from coal industry association the CCTD. Coal consumed by the steel manufacturing sector rose by 1.2pc on the year to 620mn t in the first 11 months of this year.

Some market participants expect stimulus measures and

a relaxation of the country's zero-Covid policy to spur new growth in industrial coal demand that has faltered in recent months. Infection rates in large cities have surged following the removal of almost all zero-Covid policies in the last month. It will take some time for the situation in China to stabilise and for demand to return, market participants said.

By Siew Kuan Yong

China expects tight thermal coal supply in 2023

Chinese domestic thermal coal supply is likely to remain tight in 2023, with increased demand possibly offsetting higher output during the year.

This is likely to boost demand at a time when Australian coal imports remain unofficially banned by China. There is also potential uncertainty surrounding Indonesian coal's seaborne availability in 2023, as the government pushes the country's producers to supply more coal to domestic buyers amid forecasts of higher domestic demand.

China's key coal-producing provinces – Shanxi, Inner Mongolia, Shaanxi, and Xinjiang – produced an additional 113mn t, 146mn t, 47mn t and 98mn t of coal respectively in the first 11 months of 2022, compared with the year-earlier period, according to the National Bureau of Statistics (NBS). Additional production from these four provinces accounted for over 90pc of the country's total increase in coal production. Shanxi, Inner Mongolia, Shaanxi, and Xinjiang produced 1.19bn t, 1.04bn t, 699mn t and 320mn t of coal respectively in 2021.

Shanxi expects its 2022 coal production to reach 1.3bn t – up by 107mn t compared with 2021 – and aims to raise coal production by 50mn t to 1.35bn t in 2023, according to a target by the provincial government. Inner Mongolia has accelerated its approvals of coal mine capacity expansions, allowing local coal producers to raise output from 20 November 2022 to 31 March 2023 although some mines are still waiting for final approvals to raise their production. This could lead to about 70mn t/yr of additional capacity, according to the Inner Mongolia Energy Bureau.

But increasing domestic coal production could face headwinds in subsequent years because of safety concerns. Operations at 367 coal mines in the country have surpassed their safe extraction limits, threatening mine safety standards, China's National Mine Safety Administration said.

GDP growth to accelerate

China's household savings have risen since 2020, boosting GDP growth. China's GDP growth is forecast to accelerate from 3pc

in 2022 to 4.5pc in 2023 as the country moves away from its zero-Covid policy, according to Goldman Sachs Research.

Forecasts of higher GDP growth reflect a brighter outlook for the country's infrastructure sector. China's infrastructure investment in 2022 is expected to rise by 11pc on the year, with around 4 trillion yuan (\$576bn) of local government bonds supporting infrastructure projects, according to market participants.

Real estate and infrastructure are essential drivers of China's economy, boosting coal demand outside of the power sector. The cement industry's coal consumption stood at 480mn t in January-November 2022, while coal use by the steel and chemical manufacturing industries were at 620mn t and 290mn t, respectively, according to data compiled by coal industry association the CCTD.

Indonesian consumption set to rise

Indonesian seaborne coal supply could be tight in 2023, market participants said. Indonesia's energy ministry (ESDM) forecast coal consumption by the country's power generation sector could reach 161.16mn t in 2023, up from 128mn t in 2022. A shortage of heavy equipment and uncertain weather patterns could also weigh on Indonesian producers' plans to raise output.

The ESDM recently announced plans to start collecting a coal levy based on specific coal qualities in next year's first quarter. This is likely to increase China's coal import costs as Indonesia is the country's largest thermal coal supplier. China imported 151.2mn t of Indonesian thermal coal in January-November 2022, accounting for 78pc of overall imports during the period, China's custom data show. China imported 193.2mn t of Indonesian coal in 2021, up from 140.3mn t in 2020.

Chinese utilities mainly buy low calorific value (CV) Indonesian coal to meet their operational budgets by blending this grade of coal with higher-CV domestic coal and Russian material.

China updates coal import tariff legislation

Possible adjustments to China's thermal coal import tariffs in the second quarter of 2023 could negatively impact Russian and South African imports. But it remains unclear exactly which tariffs will be in place after the amendments have been instated.

The customs tariff commission of China's state council issued a notice on 29 December detailing updated import and export tariff legislation for a swathe of goods, including

thermal coal.

The document states that import tariffs for thermal coal – including non-coking bituminous coal, sub-bituminous coal and lignite – will be temporarily waived during January-March next year.

China does not currently impose tariffs on thermal coal, but the commission's document envisages tariffs of 3-6pc on thermal coal products outside of the waiver period.

It is unclear whether the waiver period will be extended beyond January-March. If it is not, thermal coal imports to China from certain countries could be subject to the taxes.

Russia, South Africa impacted

The countries most affected by the taxes could be Russia and South Africa, as imports from southeast Asia and Australia are exempt from taxes under previously-arranged free trade agreements. This means that coal from that Indonesia – China's largest supplier – could continue to flow at zero duty. And Australian coal could also be imported at zero duty, although China's ban on Australian product makes this a moot point.

China's thermal coal imports in January-November stood at 195mn t, down by 17.6pc from a year earlier, Chinese customs data show. The decline in imports came largely because of higher domestic output. The country produced 4.1bn t of coal in the first 11 months of this year, up by 9.7pc from a year earlier, according to National Bureau of Statistics data.

China imported 151mn t from Indonesia in January-November, and 32.4mn t from Russia. Imports from South Africa have fallen to below 1mn t this year, down from 5.8mn t in Jan-Nov 2021. China in 2021 relaxed restrictions on fluorine requirements in its imports, allowing for a pick-up in South African trade. China's imports from Australia fell to just 4.6mn t in January-November 2021 and 686,000t in January-November 2022, from around 46mn t/yr over 2015-2020.

By Siew Kuan Yong and Alex Thackrah

India to compensate utilities for importing coal

The Indian government should fully compensate utilities that rely on imported thermal coal for supplying power under emergency rules that were triggered last year, when there were fears that the country was heading for a power crisis.

The ruling follows a petition by private-sector utility Tata Power, said power regulator the Central Electricity Regulatory Commission (CERC).

Tata Power filed the petition with CERC after the country's ministry of power invoked an emergency clause in May 2022,

when a severe heatwave fuelled concerns of a looming power crisis in India while domestic coal supplies were tight. India in [May last year invoked emergency rules](#) under federal electricity law, ordering utilities using imported coal to boost electricity generation by operating at full capacity.

Under the latest directive, utilities should be compensated for supplying power for the period from 6 May 2022 until 31 October 2022 "or such other period as extended by the power ministry from time to time...to offset the adverse financial impact caused to the petitioner," CERC said.

India started pushing coal-fired utilities to [import more coal](#) early last year to prevent the risk of large-scale blackouts following a steep increase in power demand. India's power demand rebounded strongly last year in line with a sharp recovery in economic activity as Covid-19 restrictions were eased. A severe summer heatwave boosted India's electricity consumption further.

Indian utilities initially started facing coal shortages in October 2021, taking the country to the brink of a power crisis. Coal-fired power plants, with a total combined capacity of about 203GW, account for more than half of India's overall generation capacity.

Indian coal imports were strong for most of last year because of robust coal burn by the power sector. The country's thermal coal imports in November 2022 increased on the year for the sixth consecutive month, gaining by 2.12mn t on the year to 12.88mn t, according to the latest data from ship broker GAC. The country's aggregate imports of 149.63mn t in January-November 2022 exceeded the 139mn t of imports for the whole of 2021.

Coal burn also remained strong heading into December 2022 with coal burn averaging 128GW during 1-18 December, Central Electricity Authority data show, compared with 114GW during the same period a year earlier. This was equivalent to a 2.9mn t increase in NAR 5,000 kcal/kg coal consumption during the 18-day period, assuming a 36pc efficiency for coal plants.

By Andrew Jones

REFINING

Texas refineries report upsets amid winter blast

Multiple Texas refineries reported disruptions to operations following a wave of sub-freezing weather that swept through the region on 23 December. Several were able to restart operations over the weekend, but some petroleum coke production was lost, resulting in lower availability in the US Gulf, market

participants said.

State environmental regulators said units at Phillips 66's 247,000 b/d refinery in Sweeny, Valero's 95,000 b/d Three Rivers refinery near Corpus Christi and Motiva's 600,000 b/d Port Arthur refinery were in the process of bringing full operations back on line as of 27 December.

ExxonMobil's 557,000 b/d Baytown refinery adjusted operations in anticipation of the weather on 23 December, per a separate report. ExxonMobil's 362,000 b/d refinery in Beaumont also reported flaring.

Operations at TotalEnergies' 240,000 b/d refinery in Port Arthur were expected to be down for a few days because of steam issues, according to a source familiar with refinery operations.

Valero's 325,000 b/d Port Arthur refinery was planning on having steam resume on 26 December, while ExxonMobil's 366,000 b/d Beaumont refinery was coming back on line the morning of 27 December after reducing rates prior to the freeze, the source said.

Valero's 160,000 b/d refinery in Houston, Phillips 66's 147,000 b/d refinery in Borger and Pemex's 340,000 b/d refinery in Deer Park also reported flaring events.

Temperatures along the Houston Ship Channel dipped to between 10-20°F during the overnight hours of 23 December, then returned to below freezing for the next three nights before an extended warm-up began to take hold.

Power outages do not appear to be a root cause of the outages as the Texas power grid continued to operate normally.

Turnarounds, weather to drive US fuel oil

Wholesale fuel oil markets across the US face uncertain price pressure heading into 2023, as seasonal heating demand in the northeast and Gulf coast crude unit turnarounds have the potential to siphon supplies in currently saturated regional markets.

As major crude distillation units (CDUs) head into turnaround, supplies of both high-sulphur fuel oil (HSFO) and low-sulphur blending components – such as slurry oil, atmospheric tower bottoms and vacuum-gasoil (VGO) – may tighten, allowing prices to rise after bottoming out this winter. This will bolster blending component costs in the event of short supply and allow 0.5pc low-sulphur fuel oil (LSFO) differentials to rise versus the crude basis.

Planned CDU maintenance is expected to begin at a 584,000 b/d Baytown, Texas, refinery, in the first quarter of 2023 as well as potential crude turnarounds at a 160,000 b/d

Houston, Texas, refinery and a 325,000 b/d Port Arthur, Texas, refinery.

If Gulf coast coking units experience maintenance, HSFO may lose a potential outlet for feedstock demand, and prices could fall further, after hitting \$51/bl on 6 December, the lowest since February 2021, as supplies rise without a home.

Similar to the US Gulf coast, a cold northeast winter could instigate a drop in fuel oil supply and return 0.3pc sulphur fuel oil prices to unprecedented highs, should the distillate, natural gas and coal sectors experience unexpected price surges.

A looming concern market participants face is the potential for thin distillate supply on the US east coast, as transatlantic shipments to the region remain subdued following a global supply shock this year. Should heating demand surge, distillate markets remain vulnerable to national supply tightness, increasing the potential for buyers to turn to No.2 home heating oil. That could sap supplies of 0.3pc sulphur fuel oil as it is used as a blendstock for No.2.

Mild weather conditions tempered demand for 0.3pc sulphur fuel oil in the New York Harbor in early December, until a US arctic blast sent 0.3pc sulphur fuel oil prices last week above \$106/bl, the highest in a month. Cash prices may subside in the first weeks of 2023, which could ease supply concerns, as above-average temperatures are expected to cover New England through 12 January, according to the private forecaster Commodity Weather Group.

Overall, fuel oil demand was projected to remain lackluster in the Gulf coast and Atlantic coast prior to the first quarter of 2023, as ad valorem taxes assessed on inventories at year-end discourage buyers from purchasing inventory to carry into the new year.

A volatile year in review

Residual fuel oil in the US Gulf coast saw unprecedented price volatility in 2022, as values for both low- and high-sulphur grades surged to all-time highs on 8 March, directly following US sanctions on Russian refined products following the invasion of Ukraine – only to plummet this fall and winter.

Houston 0.5pc LSFO prices in early March struck \$143.73/bl, while 3.5pc HSFO in the Gulf rose to \$113.65/bl, the highest in Argus pricing history dating back to 2018 for LSFO and to 2016 for HSFO. Russia accounted for nearly 80pc of Gulf coast fuel oil imports in 2021, according to oil analytics firm Vortexa.

Prices proceeded to wane marginally by late March and throughout April, as a grace period allowed pre-ban cargoes to discharge to the US until 22 April.

REFINING SPOTLIGHT

ANS output down slightly, west coast refinery runs slip
 LyondellBasell sets more stringent GHG goals
 US housing slump weighs on asphalt demand
 US to uphold Venezuela opposition claim to Citgo
 Mexico's AMLO to visit Pemex refineries
 Pemex Nov refined products output up nearly 30pc
 Diesel wave hit Europe in December
 Polish refinery runs fell in November
 China raises oil product quotas in first batch for 2023

Values once again began a steady rise this past summer, driven by climbing Ice Brent crude futures as well as a prompt barge shortage of the import-driven product, low-sulphur vacuum-gasoil (LSVGO), in the US Gulf coast. LSFO barge prices spiked to \$142.08/bl on 8 June, just \$2.65/bl shy of the high reached in March, as LSVGO reached well above \$30/bl over Brent crude and peaked at Brent +\$35.495/bl on 17 and 21 June, the highest mark in *Argus* price history.

By early fall, US Gulf coast refiners began seeking new fuel oil avenues from the Middle East and Latin America, as a prompt diesel shortage struck the globe, and refinery utilisation rates spiked in the US to maximise distillate production. In turn, with heavy grade fuel oil and LSFO blending components a byproduct of CDUs, regional fuel oil supplies skyrocketed to levels last seen in mid-2020, even with sanctions in place.

Alongside ample supplies of components, which reduced blending costs, Houston LSFO barge cash differentials swung to a discount to Ice Brent crude by mid-November, hitting as low as \$3/bl below the crude complex on 18 November, or the lowest differential assessment seen in *Argus* history dating to March 2021.

Gulf coast LSFO barges averaged \$2.27/bl below crude for a 20° API gravity in December. Levels are projected to remain subdued to start 2023 with lackluster demand, until turn-arounds spark a shift in supply.

By Kayla Meyertons

China oil product exports set to rise

China's oil product exports are on course to remain high in the coming months as new refinery capacity starts up, despite a likely rise in domestic transportation fuel demand as the

government ends its Covid-19 restrictions.

Domestic supplies are rising, with diesel output hitting an all-time high of 4.73mn b/d in November, beating the previous record of 4.53mn b/d in October, national statistics bureau (NBS) data show. Rising output, together with a massive export quota issued at the end of September, sent diesel exports to a 17-month high of 522,000 b/d in November.

New refining capacity is starting up in coastal regions, boosting supply and leaving more products available for export. Private-sector Shenghong ran its new 320,000 b/d Lianyungang refinery at 70pc of capacity in December, while state-controlled PetroChina's 400,000 b/d Jieyang refinery will increase supplies, particularly in south China, should it start operations in the first quarter of 2023 as scheduled. These two new refineries alone have the design capacity to produce 350,000 b/d of clean products.

The start-ups at Lianyungang and Jieyang come as fewer large export-oriented refineries are due to undergo turn-arounds in 2023 compared to 2022. The 200,000 b/d Wepec Dalian refinery in northeast China finished an 80-day turnaround in the third quarter of 2022, while state-run CNOOC will take a 50-day turnaround at its 240,000 b/d Huizhou refinery from the end of March to early May 2023.

More of China's diesel exports could reach Europe, as the EU's ban on Russian oil products that takes effect on 2 February will tighten regional availability during the high-demand heating season. Chinese exporters led by state-run Sinochem shipped 67,000 b/d of European winter-specification diesel to the Amsterdam-Rotterdam-Antwerp (ARA) hub in October, a record monthly high. But the window to send products from China to Europe markets may be limited, as high freight rates and the prospect of a seasonal fall in water levels on key inland waterways in Europe limit the trade.

Chinese refiners that cannot produce European standard diesel are likely to look to short-haul routes. A key indicator of regional export economics – the discount of diesel prices in China's Bohai region to those in Singapore, including freight – fell to \$10/bl in October from a high for the year of \$43/bl in June, when tight quotas prevented exporters from taking advantage of strong margins. The spread rallied to around \$20/bl in late December as weaker winter demand hit Bohai prices.

Diesel demand typically falls during the winter and over the lunar new year period in late January, but the government's abrupt decision to drop its zero-Covid policy has scrambled the short-term outlook for transportation fuels. Pent-up demand for travel remains strong – searches for overseas re-

sort bookings have surged tenfold compared to a year earlier, while searches for international air tickets and hotels reached three-year peaks, Chinese travel booking website Ctrip said on 27 December, after the government said it would lift quarantine requirements for inbound arrivals from 8 January.

China's gross domestic product (GDP) is likely to expand by just 3.2pc in 2022, according to IMF predictions. It sees growth increasing to 4.4pc in 2023, in forecasts made before the major change in China's Covid policy.

Growth will underpin transportation fuel demand, but a weaker outlook for the real estate sector could slow construction activity and hurt related demand for diesel from the industrial and haulage industries.

Pemex foresees less crude output, refining

State-owned Pemex's 2023-2027 business plan designed by President Andres Manuel Lopez Obrador's administration cuts crude production goals and expected refinery throughput set in previous plans.

In the document published in mid-December, Pemex presents different scenarios, but in its baseline scenario the company expects that there will be no production from the 340,000 b/d Olmeca refinery in Dos Bocas, Tabasco in 2023, despite Lopez Obrador's pledge to do so.

The Mexican government inaugurated the refinery on 1 July. Yet full [completion is now not expected until mid-2023](#) which pushes the original start date even further.

Under this same scenario, Pemex expects to process 995,000 b/d crude in its refining system in 2023, or 50pc below the goal in its 2022 business plan and that in a [10-point plan](#) backed up by Lopez Obrador in 2021.

The oil company also seems to diverge from its plan of exporting less crude to process it internally, as out of its 1.9mn b/d crude production goal for 2023, Pemex expects to export 971,000 b/d, about 50pc of its total output.

In its prior 10-point plan, Pemex expected to export 435,000 b/d of crude and process nearly 1.5mn b/d in its six refineries in Mexico.

Pemex high financial debt could be behind the strategy change, as exporting crude is Pemex's main revenue source.

Decreasing crude exports for debt-laden Pemex would mean less income for a company that has [asked for additional government resources](#) to cover its maturities that expire next year.

Pemex has noted the higher value of its crude in international markets given recent geopolitical events, because of

limited supplies derived from sanctions on Russian crude and a disruption in the Keystone pipeline that reduced the supply of Canadian crude to US Gulf coast refineries.

Even under the Lopez Obrador's administration ultimate goal of energy self-sufficiency, Pemex anticipates gasoline and diesel imports will continue at least until 2027. The Mexican president's six-year term ends in 2024.

"Gasoline production in the base-scenario will allow to reduce the dependence on imports from 60pc in 2022 to 22pc in 2027 with domestic production," Pemex's document says. "If we consider Deer Park, net imports would be 5pc."

The 340,000 b/d Deer Park that Pemex purchased is in Texas, but its refined products output would not be domestic production even if owned by Pemex.

Pemex expects to produce 2mn b/d by 2024, results that are below the president's promise of 2.4mn b/d of crude by the end of this term.

By Sergio Meana

STEEL AND STEEL FEEDSTOCKS

Chinese steelmaker Baowu to acquire Sinosteel

Chinese steelmaker Baowu Steel will acquire metallurgical mining firm Sinosteel, in a move that will add upstream resources for the world's largest steelmaker.

Sinosteel was delisted from China's state-owned assets supervision and administration commission's 97 central enterprises after Baowu Steel's announcement on 21 December.

Chinese central enterprises – commonly known as state-owned enterprises (SOEs) – include five steel and iron ore groups – Baowu Steel, Ansteel, [China Mineral Resources](#), China Minmetals, and China Iron and Steel Research Institute.

Baowu produced 120mn t of crude steel in 2021, making it the largest steel producer in the world, followed by Arcelor-Mittal with 69.1mn t.

Baowu was formed following the merger of Baosteel and Wisco in 2016, which gave it a capacity of 59mn t/yr. Its 2019 acquisition of Maanshan Iron and Steel raised its capacity to 90mn t/yr. It took control of the 13mn t/yr [Taiyuan Iron and Steel](#) (Tisco) in north China's Shanxi province in August 2020. Baowu completed the acquisition of Kunming Iron and Steel with a 10mn t/yr capacity in 2021 and announced plans to [acquire Shandong Iron and Steel](#) in July 2021. Shandong Steel will increase Baowu's installed capacity to 155mn t/yr. Baowu also acquired a 44.81pc stake in [Xinyu Steel](#), which has a capacity of 10mn t/yr, in April.

But the acquisition of Sinosteel, which controls iron ore reserves of more than 2bn t, will not add more steel capacity for Baowu Steel's 200mn t target by 2025. Sinosteel is mainly engaged in trading and logistics of metallurgical raw materials. Sinosteel invested in Australia through the Channar iron ore joint venture with UK-Australian mining firm Rio Tinto in 1987. It is also looking to develop the Midwest iron ore project, which it acquired in 2019.

Sinosteel's Engineering Procurement Construction (EPC) and Russia's MMK signed a contract in 2018 for the construction of a coke oven battery complex and reconstruction of a plant for capturing and processing chemical products in Russia.

Sinosteel's total revenue was 15.86bn yuan last year, with assets worth Yn24.28bn yuan. [Rio Tinto and Baowu plan to develop](#) the 25mn t/yr Western Range mine at the Paraburdoo hub in Western Australia. Rio Tinto is also part of a joint venture with Baowu and other Chinese state-owned firms in the Simandou iron ore project in Guinea.

OIL

Indian crude imports from Russia hit all-time high

India's imports of Russian crude rose to an all-time high in December 2022, remaining above 1mn b/d for the seventh consecutive month.

India's imports of crude from Russian ports, including CPC Blend of Kazakh origin, rose to 1.23mn b/d in December 2022 from 1.09mn b/d in November 2022, data from oil analytics firm Vortexa show. Imports excluding CPC Blend were around 1.19mn b/d, rising from 945,000 b/d in November. Imports from Russia rose despite the G7 price cap on Russian supplies that came into force on 5 December.

The largest proportion of imports at 477,000 b/d went to the port of Sikka, where private-sector Reliance Industries operates the 1.24mn b/d Jamnagar refinery complex.

Vadinar port, where Russian-owned Nayara Energy operates a 400,000 b/d refinery, received the second-highest amount of shipments at 248,000 b/d. Mundra port in Gujarat state received 166,000 b/d, while Paradip and Visakhapatnam (Vizag) ports received around 95,100 b/d and 79,000 b/d, respectively.

Medium-sour Urals crude made up 78pc of India's crude imports from Russia in December at 957,000 b/d, followed by Arco heavy-sour crude at 10pc or 124,000 b/d, Vortexa data show.

India has historically been a marginal importer of Russian crude, taking just 50,000 b/d in 2021. But deliveries of

OIL SPOTLIGHT

High hurdles to grow Chevron's Venezuela oil output Guido out as head of Venezuelan opposition

Russian crude to India rose sharply after the Russian invasion of Ukraine in late February 2022. Indian importers have taken advantage of discounted Russian crude during this period.

India imported a total of 4.63mn b/d of crude in December, rising by around 7pc from a revised 4.33mn b/d in November, Vortexa data show. Russia accounted for nearly 27pc of Indian crude imports, followed by Iraq at 17pc or 786,000 b/d and Saudi Arabia at 15pc or 702,000 b/d.

The port of Sikka received the largest share of imports at 1.39mn b/d, followed by Vadinar at 788,000 b/d and Paradip at 636,000 b/d.

India's minister for petroleum and natural gas Hardeep Singh Puri said in November that India is not concerned about crude supplies after the G7 price cap on Russian oil purchases would kick in on 5 December. The minister had said earlier in November that India will continue to buy Russian crude to meet the energy needs of its 1.34bn people.

Russian president Vladimir Putin signed a decree on 27 December that will [impose a ban on Russian oil exports](#) to companies and traders that comply with the price cap mechanism. The oil export ban will come into effect on 1 February and will remain in place until 1 July, Russian state news agency Tass said.

Russian crude exports have increasingly flowed to India and China since the Russia-Ukraine war began. Russian crude supplies to all countries were at 3.97mn b/d in December 2022, down from 4.39mn b/d a month earlier, Vortexa data show. But Russian supplies to India and China totalled over 2.1mn b/d in December, stable compared with November.

Russian companies have been increasing crude supplies to "friendly countries" in the Asia-Pacific region, Africa and Latin America and have been switching trade with them to national currencies, deputy prime minister Alexander Novak said on 23 December.

[Russia may have to cut its crude output by 500,000-700,000 b/d](#) in "some moments" in early 2023 if buyers insist on applying the G7-led price cap, Novak said.

By Pranav Joshi

Venezuela loads crude under eased sanctions

The second ship in 72 hours slated to carry 250,000 bl of Boscan heavy crude for Chevron to the US entered Venezuela's Lake Maracaibo on 3 January, marking the first exports to the US since the country eased sanctions in late November.

The *Kerala* Panamax tanker arrived at the port of Bajo Grande, Zulia state, after leaving Honduras on 11 December, ship tracking information confirmed. The tanker will carry crude to a US refinery in the Gulf of Mexico, mostly likely Chevron's 369,000 b/d Pascagoula refinery which is suited for Boscan-type heavy crude grades, a Chevron source and another in Maracaibo said.

It follows the *Beauty One* Handymax which arrived at Lake Maracaibo on 29 December. It is expected to complete loading 250,000 bl of Boscan crude and leave soon, sources have said.

The port is the closest to Chevron's Petroboscan asphaltic crude project with state-owned PdV, which is [now producing some 10,000 b/d since 21 December](#) after being mothballed since June. The *Caribbean Voyager* Aframax was also expected to load upgraded Merey 16 or similar crude in eastern Venezuela's Jose terminal starting this weekend for Chevron, sources and ship tracking data confirmed.

The *UACC Eagle* chartered by Chevron is also in transit to arrive on 5 January at Venezuela's Jose terminal, laden with 620,400 bl of naphtha according to Vortexa data.

Oil operations have intensified even as the US state department said on Tuesday it does not consider Nicolas Maduro to be the legitimate president of Venezuela.

[The US government will work with the Venezuelan opposition](#) to uphold its claim to US refiner Citgo and the country's other overseas assets despite the recent ouster of Juan Guaido, whom Washington viewed as Venezuela's legitimate leader, the department said.

By Carlos Camacho

Keystone pipeline repaired, restarted

TC Energy's 622,000 b/d Keystone crude pipeline has been repaired and is back in service at reduced pressure after a leak in Kansas forced it offline for more than three weeks.

The Keystone system is operational to all delivery points, the Calgary-based operator said 29 December, allowing flows of heavy Canadian crude to once again reach the US Gulf coast through its 2,687-mile network.

The system's Cushing Extension segment, a 288-mile stretch south of Steele City, Nebraska, delivering crude to Cushing, has been shut since [14,000 bl of crude spilled](#) near

Washington, Kansas, on 7 December.

The Cushing Extension is estimated to handle at least 156,000 b/d.

The line extending from Steele City to Illinois [was returned to service on 14 December](#) at a reduced pressure.

The restart [was approved](#) by US Pipeline and Hazardous Materials Safety Administration (PHMSA) last week, on the condition that the 96-mile affected segment operates at reduced rates. The pressure will be capped at 80pc of the line's pressure at the time of the failure, which was running at 86pc of the maximum operating pressure (MOP). The resulting cap will be 69pc of the pipeline's MOP.

The MOP of the pipeline is 1,440 pounds per square inch gauge (psig), setting the new temporary limit at 994 psig.

Last week TC Energy [sent a section of pipe away for analysis](#) at an independent lab, but the cause of the spill is unclear.

About 7,690 bl of crude has been recovered as of 23 December and cleanup efforts continue with more than 700 people on-site.

February Nymex WTI fell by 56¢/bl to \$78.40/bl on 29 December while February Ice Brent fell by \$1/bl to \$82.26/bl, in part because of the news. The February Brent-February WTI spread narrowed by 44¢/bl to \$3.86/bl.

WTI at Houston was discussed at a 50¢-70¢/bl premium to the US light sweet crude benchmark at Nymex settlement on 29 December, down from a volume-weighted average premium of 78¢/bl the previous day, according to the *Argus Crude Market Ticker*.

The shutdown had [previously resulted in a rise in sour crude prices in the US against WTI](#), as market participants looked for alternatives to the heavy crude typically delivered to the US by Keystone. Medium sour Southern Green Canyon (SGC) rose to trade at its highest against WTI since May of 2020. SGC traded in Nederland at a \$1.90/bl premium to WTI on 22 December. WCS Cushing saw trades at an \$11/bl discount to the CMA Nymex WTI on 16 December. Access Western Blend (AWB), a heavy sour grade delivered to the US from Canada, traded in Houston at a \$7.50/bl discount to CMA Nymex WTI on 22 December. On 7 December, the day the Keystone pipeline shut operations, it traded at a \$18.80/bl discount.

By Brett Holmes

FREIGHT

Potential ship slowdown may alter dry trade

Many dry bulk shipowners will have to slow steam their fleets

for their vessels to achieve a passing rating in the International Maritime Organization's (IMO) Carbon Intensity Indicator (CII) regulation, which took effect on 1 January 2023, potentially disrupting a dry bulk shipping segment hampered by geopolitical turmoil and a sagging global economy.

The insufficient availability of alternative fuels, as well as ships equipped to utilise them, means that to score a passing rating on the CII, shipowners of older, less fuel-efficient fleets are likely to choose to slow their vessels.

A relative lack of dry bulker newbuildings has caused the global fleet to age considerably in the last decade. The number of vessels on the water aged 11 years or older is nearly double the amount in 2010, comprising nearly half of the entire fleet.

Shipowners are waiting for new technologies and legislation to force their hand into scrapping older vessels with carbon-intensive engines as steel prices associated with scrapping remain low compared to a strong secondhand market.

Reducing the average speed of a Supramax bulker to 12 knots from 14 knots adds six additional voyage days when traveling from the US Gulf coast to China. This would theoretically raise the CII rating for the bulker to a B rank, up from a failing E rank, according to Argus calculations. The extra time spent traveling will block tonnage from replenishing global supply as quickly, which could shrink the available global fleet and boost freight rates as a result.

A hike in dry freight costs may reduce arbitrage opportunities on long-haul trades, leading buyers to take advantage of nearby suppliers.

The extent to which dry bulk vessels opt to slow steam next year will depend on how incentivized shipowners are to receive passing ratings for their ships. There is no clear penalty for CII non-compliance.

Low bulker demand plagued 2022

Reduced Chinese steelmaking demand amid the country's ongoing real estate crisis was a major reason for a downturn in dry bulk demand in 2022. Iron ore tonne miles, the major driver of Capesize demand, fell by 5.1pc in the first nine months of 2022 from a year earlier.

The lack of Capesize demand caused by China's inability to shake its Covid-19 lockdowns to get production back spurred the segment to compete for smaller Panamax-sized cargoes when South American grain demand put upward pressure on transatlantic Panamax rates. On 28 March, the \$/t rate for a Capesize on the US east coast-Rotterdam route was about

FREIGHT SPOTLIGHT

[Atlantic Capesize rates slide to start 2023](#)
[Shipowner Norden raises 2022 profit forecast](#)
[Fog suspends Turkish Straits traffic](#)
[Houston Ship Channel reopens](#)

half the rate for Panamaxes making the same journey. The increase in competition for these cargoes helped put downward pressure on Panamax rates in the process, dropping to near parity by 15 June.

Weak Capesize demand, alongside reduced global congestion which added to the tonnage glut, pulled \$/day earnings for the segment below operating expense levels, leading shipowners to lay up some vessels in early September instead of operating at a loss.

Chinese GDP growth is projected to increase by 4.4pc next year after lower than expected 3.2pc growth in 2022 largely caused by the strict Covid lockdowns and the real estate crisis, according to October estimates from the IMF. An increase next year in steelmaking demand from the country's real estate sector may provide support for Capesize rates.

By Ross Griffith

P&I clubs cancel Black Sea war risk coverage

Shipowners transiting the Black Sea will no longer be insured against fallout from the conflict in Ukraine beginning 1 January in a move pushed by reinsurers, the companies that protect insurance companies financially, according to notices released by four Protection and Indemnity (P&I) clubs.

"Due to the impact of losses from the Russian/Ukrainian situation affecting the availability of global insurance and reinsurance capacity, the Club's reinsurers are no longer able to secure reinsurance for war risk exposure to Russian, Ukrainian or Belarus territorial risks," UK P&I said.

The lifting of war risk coverage applies to losses "caused by or arising from or in connection with any Russia-Ukraine conflict and/or any expansion of such conflict" within the Black Sea, with "capture, seizure, arrest, detainment, confiscation, nationalization, expropriation, deprivation or requisition for title or use, or the restraint of movement of vessels and cargo" specifically outlined, according to the P&I clubs.

The loss of war risk coverage for shipowners in the region

may reduce the available vessel supply for Ukrainian exports via the grain corridor, [the pace of which has already slowed as Russian officials tie up ships with lengthy inspections](#).

Charterers looking to fix cargoes from the Black Sea will need to confirm with shipowners whether they have war risk coverage after 1 January. If so, the charterer will then have to ask to be inserted as co-insured in the shipowner's war risk coverage plan in a "temporary but common solution", according to a shipbroker, otherwise the voyage will not be insured.
By Ross Griffith

REFINERY OPERATIONS UPDATE

US Gulf coast

■ LyondellBasell reported a fire within a process unit today at its 268,000 b/d refinery in Houston, Texas. The fire occurred at 8:56am ET, with an all-clear for the incident declared approximately a half hour later, according to a community alert system. The refiner did not immediately respond to a question regarding the unit involved with the fire. A power interruption had earlier disrupted operations for a fluid catalytic cracking (FCC) at the facility. The brief outage occurred at approximately 5:35pm ET on 1 January, according to a filing to state environmental regulators. Power was re-established to the unit, and normal operations resumed within five minutes. FCCs convert vacuum gasoil primarily to gasoline blendstocks.

■ TotalEnergies' 240,000 b/d refinery in Port Arthur, Texas, commenced start-up operations on 31 December following sub-freezing temperatures hitting the region the previous week, according to a filing to state environmental regulators. The refinery was shut on 23 December because of freezing temperatures, and was down for a few days because of steam issues, according to a source familiar with refinery operations. The refiner did not comment on a time frame for resumption of full activities.

■ Flint Hills Resources started planned maintenance activities last week at its 260,000 b/d refinery in Corpus Christi, Texas. Flaring as part of planned activities in the complex's west plant commenced around 8am ET on 28 December, according to a community alert system. Flint Hills Resources did not comment on process units undergoing maintenance, nor the length of time scheduled for the planned work.

■ A pump failure within a hydrotreater unit resulted in increased emissions on 21 December at Marathon Petroleum's 561,000 b/d Galveston Bay refinery in Texas City, Texas. Flaring was reported at 7:10am ET, with normal operations resuming about an hour later, according to a filing to state environmental regulators. Hydrotreaters remove impurities such as sulphur from refinery streams.

US midcontinent

■ Phillips 66 reported a leak involving a FCC unit at its 147,000 b/d refinery in Borger, Texas last week. The leak from piping from the unit was discovered at approximately 3:45pm ET on 27 December, according to a filing with state environmental quality monitors. Previously, on 22 December, subfreezing temperatures affected crude heaters and a sulphur recovery unit (SRU) at the refinery, increasing emissions. Increased emissions from the event occurred around 1am ET, according to a filing with state environmental quality monitors. SRUs help to remove sulphur and other impurities from refinery products and gas streams.

■ Phillips 66 reported a process unit upset and associated flaring on 23 December at its 356,000 b/d Wood River refinery in Roxana, Illinois. Increased emissions occurred at 1:30am ET, according to a filing to state hazardous material monitors. The refiner did not identify the process unit affected.

US west coast

■ Marathon Petroleum reported a flaring event associated with start-up and/or shutdown operations today at its 363,500 b/d refinery in Los Angeles, California. Flaring in the Carson end of the refinery occurred at 3:45am ET, according to a filing with regional air quality monitors. Marathon Petroleum does not comment on refinery operations.

■ Planned maintenance and associated flaring started earlier this week at PBF Energy's 157,000 b/d refinery in Martinez, California. Work activities and continuous flaring started on 2 January, with potential intermittent flaring throughout the rest of the month, according to a filing to regional hazardous materials monitors. The refiner did not comment on units affected during the planned event.

US Atlantic coast

■ A pump failure resulted in increased emissions the week before last at PBF Energy's 190,000 b/d Delaware City refinery

in New Castle, Delaware. Flaring occurred at 2:15am ET on 24 December, with the event ending after several minutes, according to a filing to state environmental regulators. The refiner did not identify the process unit involved.

Latin America

- A fire occurred at Venezuelan state-owned PdV's Petro-Monagas upgrader last week. According to an internal PdV event report, the PetroMonagas fire started on 28 December at 4:46pm ET when "during a steam injection procedure to drum D-1302 B through FV13042, product leakage and fire" were reported "at the drum feed line level". The fire was put out on the morning of 29 December with no worker deaths reported. Process units were out of service.
- A fire broke out around a flare at Venezuela's 305,000 b/d Cardon refinery on 26 December. Video of the blaze appeared to show open pits around a gas separator flare burning. The fire had been put out as of 29 December.

Petroleum Coke Market Overview

Including the latest trade data, this study provides a country-level assessment of the global market and analysis of key countries that will influence the outlook to 2020.

Email us at info@argusmedia.com for further information

www.argusmedia.com/petcoke-study

ANODE COKE MARKET

Anode coke: Green prices slump in China

Anode-grade green petroleum coke prices fell in November, particularly for low-sulphur grades, as Covid-19 restrictions in China weighed on demand and transport logistics.

[To continue reading about the anode market, click here.](#)

ANODE COKE NEWS

China overshoots on battery anodes

Optimistic forecasts for lithium-ion battery market growth have spurred a surge in planned anode production projects, especially in China. But China's rapid development may be overshooting even this strongly growing demand, potentially setting up the market for a slowdown on the back of overcapacity.

Chinese producers have announced plans to boost capacity of synthetic graphite battery anode material to 14mn t/yr in coming years, up nearly ninefold from 1.6mn t/yr today, according to industry projections. They also intend to increase silicon anode capacity to 270,000 t/yr.

But the synthetic graphite capacity alone would be almost five times the forecast global demand for battery anode by 2025, casting doubt on how many projects will actually be developed.

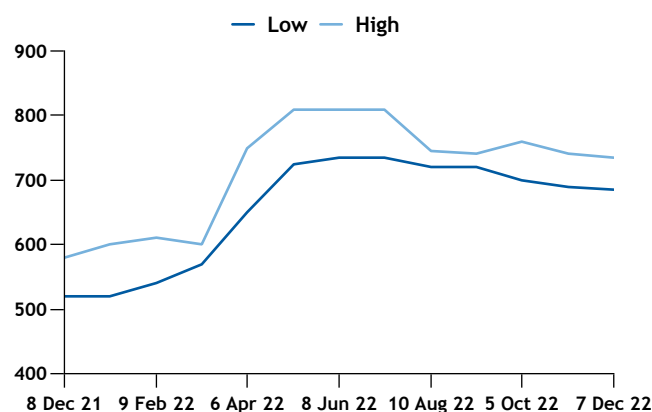
In just the past two months, China's Guizhou province said it aims to build 800,000 t/yr of battery anodes and feedstock materials capacity by 2025. Jiangsu HSC New Energy Materials said it plans to complete a 200,000 t/yr anode material production facility in Jiangyin in east China's Jiangsu province

Monthly anode-grade coke assessments: Nov					\$/t
Assessment date: 7 Dec 22	Sulphur	Low	High	Mid	
Green					
cif US Gulf, dry basis	0.8%	690.00	740.00	715.00	
	3.0%	310.00	345.00	327.50	
	5.0%	181.50	196.50	189.00	
fob China, as received	0.8%	600.00	730.00	665.00	
	2.0%	570.00	670.00	620.00	
	3.0%	450.00	630.00	540.00	
fob Mideast Gulf, as received	4.0%	420.00	510.00	465.00	
Calcined					
fob US Gulf	3.0%	685.00	735.00	710.00	
fob China	3.0%	915.00	940.00	927.50	
cif Europe	1.5%	665.00	720.00	692.50	
cif Mideast Gulf	3.0%	800.00	975.00	887.50	

Next assessment date: 11 Jan 23

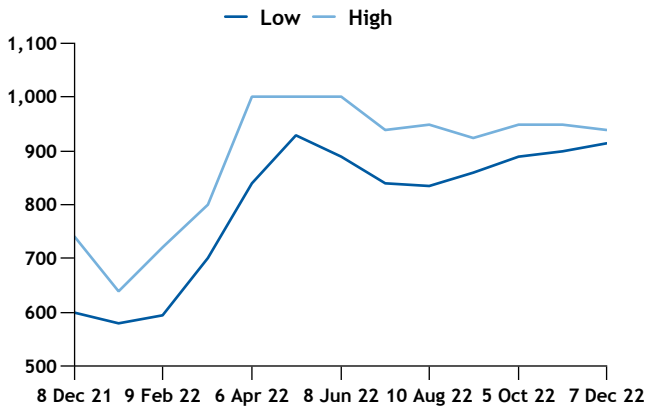
Calcined fob USGC 3% sulphur

\$/t

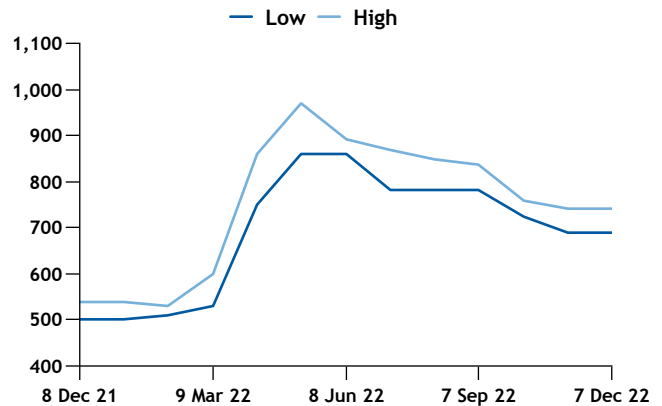


Monthly anode-grade coke assessments											\$/t
	Sulphur	Sep 22			Oct 22			Nov 22			Mid
		Low	High	Mid	Low	High	Mid	Low	High		
Green											
cif US Gulf, dry basis	0.8%	725.00	760.00	742.50	690.00	742.50	716.25	690.00	740.00	715.00	
	3.0%	310.00	345.00	327.50	310.00	345.00	327.50	310.00	345.00	327.50	
	5.0%	168.00	209.00	188.50	175.50	219.00	197.25	181.50	196.50	189.00	
fob China, as received	0.8%	720.00	805.00	762.50	710.00	770.00	740.00	600.00	730.00	665.00	
	2.0%	625.00	750.00	687.50	633.00	732.00	682.50	570.00	670.00	620.00	
	3.0%	490.00	655.00	572.50	507.00	638.00	572.50	450.00	630.00	540.00	
fob Mideast Gulf, as received	4.0%	410.00	500.00	455.00	410.00	500.00	455.00	420.00	510.00	465.00	
Calcined											
fob US Gulf	3.0%	700.00	760.00	730.00	690.00	740.00	715.00	685.00	735.00	710.00	
fob China	3.0%	890.00	950.00	920.00	900.00	950.00	925.00	915.00	940.00	927.50	
cif Europe	1.5%	700.00	740.00	720.00	700.00	740.00	720.00	665.00	720.00	692.50	
cif Mideast Gulf	3.0%	850.00	975.00	912.50	800.00	975.00	887.50	800.00	975.00	887.50	

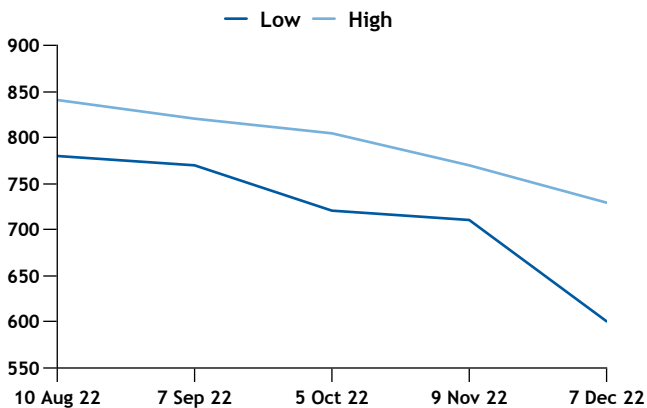
Calcined fob China 3% sulphur \$/t



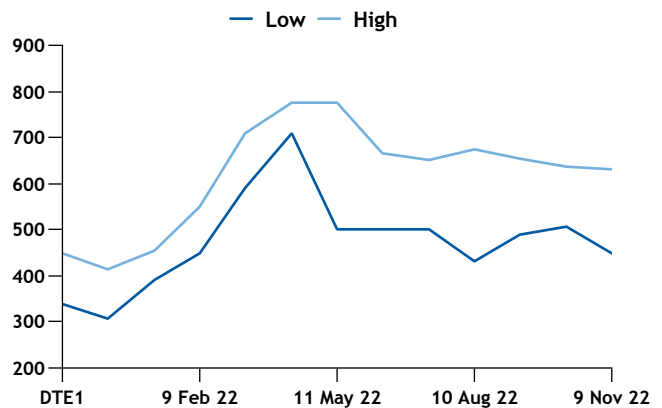
Green cif USGC 0.8% sulphur \$/t



Green fob China 0.8% sulphur \$/t



Green fob China 3% sulphur \$/t



within the next two years. [DQ Carbon announced it would build a 160,000 t/yr anode materials plant](#), and mining firm Inner Mongolia Dazhong announced it will build a 100,000 t/yr synthetic graphite anode material plant in Chifeng in north China’s Inner Mongolia region. And major battery materials producer Ningbo Shanshan said it is looking to [accelerate construction of a 300,000 t/yr anode materials plant in Kunming](#) in southwest China’s Yunnan province.

China’s northern and eastern regions today account for about 57pc of China’s synthetic graphite production. But if all of the announced projects were completed, the regions’ share would drop to 31pc. Much of the expansion is planned for the southwest, a region expected eventually to account for 35pc of China’s capacity.

Production capacity of needle petroleum coke, a key feedstock for synthetic graphite, is not expected to grow at

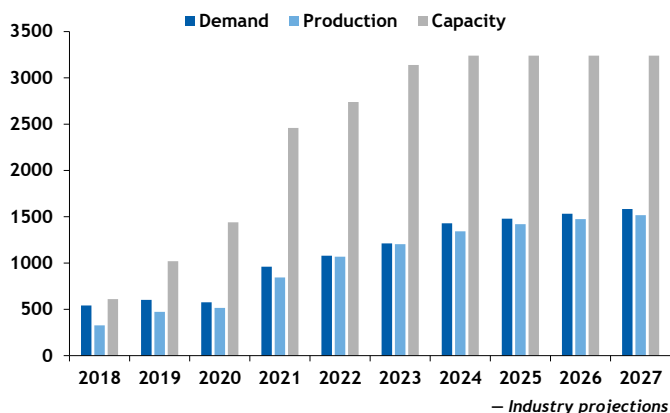
anywhere close to the same rate. Needle coke capacity is estimated at 2.7mn t for 2022 and is expected to rise by nearly 15pc to 3.1mn t in 2023 and by another 3pc in 2024. But current needle coke production is only about 1.1mn t/yr. This could help explain why [battery anode producers have been seeking to test other coke qualities](#).

China’s battery anode capacity investments have been bolstered by meteoric growth in lithium-ion battery demand, with [China’s production and sales of new energy vehicles continually setting new record highs](#) and with battery-electric vehicle production up by more than 90pc on the year in January-November, with further strong growth predicted in 2023.

Despite the strong pace of expansion, [battery anode materials demand is only projected to reach 2.9mn t/yr globally by 2025](#), up from 774,000t in 2021, if current trends in electric vehicle and other lithium-ion battery production

Chinese needle coke

'000t



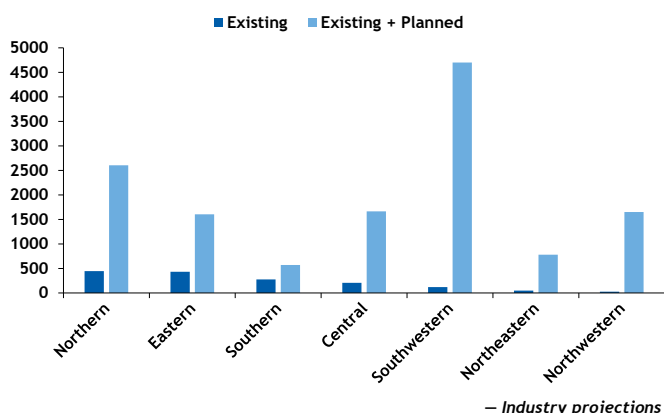
“in tight balance,” the producer said.

There are also projects under development outside of China, which may remain more viable even as the Chinese market becomes saturated, since companies and governments wish to diversify their supply chains. The US Department of Energy in October awarded \$837mn in grants to companies focused on graphite and silicon anodes, including \$150mn to Novonix to help fund its 30,000 t/yr synthetic graphite production facility in Tennessee. US independent refiner Phillips 66, the main producer of needle petroleum coke outside of China, acquired 16pc of Novonix and is partnering with the company to develop battery anode technology.

By Lauren Masterson

China synthetic graphite production by region

'000t



Alba hits new aluminium production record

Aluminium Bahrain (Alba) produced 1.6mn t of aluminium in 2022, an increase of 2.5pc from 2021 and a new record, the company said on Tuesday.

The 2022 output surpassed the record set in 2021 of 1.56mn t of aluminium. Alba’s production has steadily ramped higher since it completed an expansion project in late 2019.

By Aditya A

Aluminium premiums hold

The European aluminium market is facing a tough start to 2023, with first-quarter demand forecasts falling away against an increasingly bleak economic picture. But high energy prices and further threats to European supply bolstered premiums ahead of the year end, and traders have warned that even a small recovery in demand could lead to a swift increase in premiums in a tight 2023 market.

Few in the European aluminium market expect much trading activity in the first quarter of next year, either on contracted sales or via the spot market, as European manufacturing industries suffer against high power costs and falling end user demand.

“In Europe in particular there is a fear that manufacturing activity is about to drop off a cliff,” one analyst explained last month. “Most have not yet felt the impact of huge power cost increases but they will do in the first and second quarters, and no one is offering fixed power contracts anymore.”

London Metal Exchange (LME) aluminium prices have been volatile in recent months but trended higher through November and jumped again in the first week of December after China relaxed some of its Covid-19 lockdown restrictions. But prices subsequently fell back as Covid infections rose rapidly

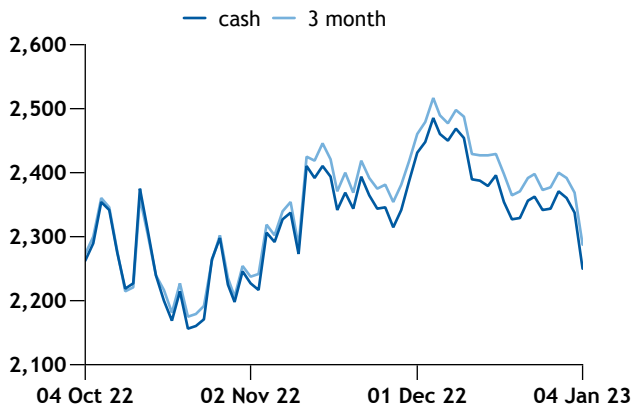
hold, according to Rystad Energy. Argus Consulting forecasts global demand for graphite will rise to 5mn t/yr by 2032. Argus Consulting is a division of Argus Media. The group’s forecasts and analyses are separate and independent of Argus’ news and price assessment business.

If all of China’s currently planned battery anode projects were to materialise, they would meet the world’s projected demand in 2050, one trader said. Already by 2023, production will be more than double expected demand.

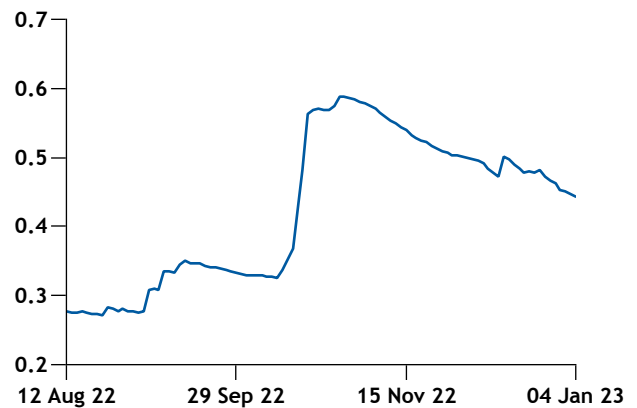
With producers becoming increasingly concerned the market will become saturated, investment has slowed, one producer said. Prices for anode materials had already fallen by more than 40pc by November from earlier last year.

But overcapacity may not be evenly distributed, as many new plants are only equipped to supply lower quality anodes, with the high-end artificial graphite anode market remaining

LME aluminium prices \$/t



LME aluminium warehouse stocks mn t



in China, souring the earlier optimism over a more open and active Chinese economy.

Three-month LME aluminium prices peaked at \$2,516/t on 5 December, the highest level since June. But prices have since fallen back below \$2,400/t, settling at \$2,363.75/t on 19 December.

Aluminium premiums in Europe fell consistently through the second half of 2022, with the decrease accelerating from late September, as demand dropped across a number of sectors, overcoming even the effects of significant production cuts earlier in the year that followed a spike in energy prices across Europe.

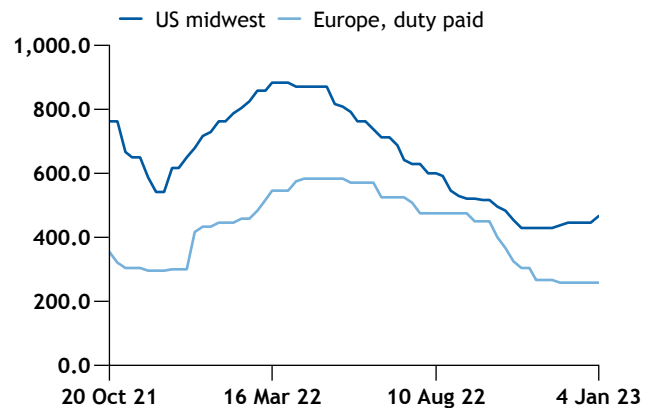
The Argus assessment for European in-warehouse Rotterdam duty-paid aluminium premiums reached \$250-270/t at the end of November, from \$450-500/t just three months previously. Few market participants at that point expected premiums to enter 2023 on anything but a further downward trajectory.

But premiums have remained unmoved in December despite consistently lower bids from buyers. Suppliers are not willing to drop offers further due to high production costs driven by energy prices, and so premiums stabilised even as LME prices fell against wider macroeconomic concerns.

Supply issues are the chief support strut for European primary aluminium premiums. Europe has cut more than a third of its aluminium production capacity this year, or around 1.4mn t/yr, and some estimates push that figure to nearer a half of capacity after further cuts driven not by power price pressures but by faltering demand levels.

Against such a diminished supply picture any stirring of demand in the new year is likely to result in a sharp reaction in premiums. Many traders will remember how premiums spiked

Aluminium premiums \$/t



to record levels in early 2011 after buyers held off from purchasing at the end of the previous year due to bleak economic forecasts, but ended up competing fiercely for available units when they did come to market in the new year.

There is potential for the same thing to happen in 2023. At some point end users will need to purchase more metal, and there may not be a large pool of available material when they do.

“Producers have suffered losses, and first-quarter costs will still be high with energy prices,” a trader said.

By Jethro Wookey

China increases aluminium export duty

The Chinese government will raise export duties on several aluminium products and remove the import tariff on cobalt metal in 2023, with its export and import duties on most

ferro-alloys and nonferrous metals to be maintained next year.

China will impose a 30pc export duty on unwrought non-alloyed aluminium with 99.95pc min under the HS code of 76011010 and raise the tariff on other unwrought non-alloyed aluminium under the HS code of 76011090 to 30pc in 2023 from 15pc in 2022.

Beijing will keep a 20pc export tariff on ferro-manganese and silico-manganese, a 25pc duty on ferro-silicon and 40pc on ferro-chrome next year. A 20pc duty on pig iron, for both alloyed and non-alloyed, will be maintained in 2023.

China in May 2021 raised the export duty on ferro-silicon to 25pc from 20pc and in August of the same year doubled its export tariff for ferro-chrome to 40pc from 20pc in a bid to better guarantee supplies of steel feedstock resources and promote high-quality development of the steel industry.

Beijing will continue to impose a 15pc duty on unwrought nickel, aluminium alloy and scrap, unwrought zinc with 99.99pc maximum, as well as a 30pc tariff on unrefined copper under the HS code of 74020000 and a 15pc duty on copper scrap. A 5pc tariff will be also imposed on high-purity copper cathode (with 99.9935pc minimum and 99.9999pc maximum) and some copper alloys and a 10pc duty will be levied on other high-purity copper cathode under the HS code of 74031119 and several refined copper fabricated products.

Japan's aluminium imports fall below 100,000t

Japan's aluminium imports fell from the previous year in November on the back of weak domestic demand for aluminium products. Volumes fell below 100,000t for the first time since July 2021.

The country imported 82,000t of aluminium in November, down by 27pc on the year. Japan's imports fell from almost every major supplier, excluding Australia and South Africa.

Domestic shipments of aluminium goods fell by 8.2pc on the year to 152,000t, according to industry group the Japan Aluminium Association. Deliveries of rolled and extruded products declined by 9.5pc to 91,000t and by 6.2pc to 61,000t, respectively.

The industry group said that demand for rolled aluminium goods for manufacturing beverage cans dropped by 6.1pc to 30,000t, partly resulting from sluggish canned beer sales because of price hikes. But demand from the auto industry rose to 16,000t, up by 1.6pc on the year on the back of recovery in domestic car production.

Demand for extruded aluminium products from the construction sector fell by 4.8pc to 38,000t because of less hous-

Japan's aluminium imports						
Origin	Nov-22	Nov-21	± %	Jan-Nov 2022	Jan-Nov 2021	± %
Australia	17,298	12,109	42.9	290,751	336,727	-13.7
Russia	24,960	30,166	-17.3	240,658	223,077	7.9
UAE	4,102	13,093	-68.7	140,140	143,487	-2.3
Brazil	10,407	11,192	-7.0	116,183	130,813	-11.2
Saudi Arabia	10,339	12,150	-14.9	144,147	116,270	24.0
New Zealand	1,210	11,185	-89.2	121,949	110,370	10.5
India	1,893	6,774	-72.1	66,806	59,174	12.9
Malaysia	9	8	5.3	52,134	48,851	6.7
Bahrain	6,705	9,507	-29.5	45,675	47,039	-2.9
South Africa	4,151	3,083	34.6	50,191	38,205	31.4
Others	1,315	3,308	-60.2	27,717	42,138	-34.2
Total	82,389	112,575	-26.8	1,296,351	1,296,149	0.0

– Japanese finance ministry

ing construction. Demand from the auto industry also fell by 0.8pc to 11,000t largely because of weak demand for trucks.

Production of aluminium goods also dropped by 7.9pc on the year to 152,000t. Rolled and extruded aluminium goods output fell by 8.9pc to 93,000t and by 6.3pc to 60,000t, respectively.

By Yusuke Maekawa

US housing slumps, weighing on rebar, Al prices

US private home construction spending fell by 0.5pc in November from the month prior, weighing on prices of rebar and some other metals, as the fastest pace of Federal Reserve rate hikes in four decades burst the latest housing boom.

Private residential spending reached a seasonally adjusted annual rate of \$868bn in November, down from October's revised rate of \$872.4bn but 5.3pc above the November 2021 rate of \$824bn.

Residential construction spending has been on the decline for several months, as the Fed in the past year has hiked its target rate seven times to 4.5pc from near zero. That doubled mortgage rates and soured home purchases and home construction.

New single-family spending fell to an annual rate of \$394.9bn in November, a 2.9pc decrease from the October rate and a 10.2pc decrease from the November 2021 rate, according to the Census Bureau.

Prices of rebar, aluminium and copper have been falling. US rebar fell to an average of \$930/short ton in November

ANODE SPOTLIGHT

China's policy change to slow NEV growth in 2023
 China's CATL launches German battery cell production
 China's Fengyuan to build lithium-ion LFP plant in Guixi
 US IRA law to impact critical mineral supply chains
 US punts rulemaking on electric vehicle tax credit
 Tesla hikes EV production by 47pc
 South Korea's Hyundai aims to accelerate EV growth
 India advances plans to develop Argentinian lithium

from \$977.50/st in October and down from the first Argus assessment of \$1,005/st in early March. US premiums for 6063 aluminium billet, used in producing extruded products such as window and door frames, averaged 20.9¢/lb in November, down by about a half cent from October. Premiums were little changed from a year earlier as falling prices for magnesium offset supply uncertainty as US consumers self-sanctioned Rusal metal.

The next active Comex copper price average was up in November from October as the dollar weakened on signs the Fed was approaching the end of its rate hike cycle. Comex copper in November averaged \$3.66/lb, up 6.7pc from October's average but 16pc below the November 2021 average. Copper is used in plumbing and electrical work.

Total spending holds up

Total construction spending rose by 0.2pc on the month to a seasonally adjusted annual rate of \$1.8 trillion. Total spending was up by 8.5pc from November 2021.

Total private construction rose to a seasonally adjusted annual rate of \$1.426 trillion, according to data from the Census Bureau. That's 0.3pc above the October rate and 8.1pc above November 2021. The increase was driven by nonresidential spending.

Private nonresidential spending rose to a rate of \$558.3bn in November, a 1.7pc increase from October and a 12.6pc increase from November 2021. This annual growth was driven largely by the two major investment segments: commercial and manufacturing spending.

Commercial spending was virtually flat in November from the prior month but remained 20.4pc above the November 2021 rate. Manufacturing spending grew by 6.5pc from October

and by 43pc from November 2021.

Public construction spending was at a rate of \$381.1bn, a 0.1pc decrease from October, but a 10.4pc increase from the November 2021 rate.

Spending on highways and streets fell by 1pc from October but remained 14.5pc above November 2021.

By Mike Hlafka, John Betz and Marialuisa Rincon

Australia's Metro misses 2022 bauxite guidance

Australian bauxite producer Metro Mining will miss its 2022 sales guidance because of weather disruptions and equipment failure, but will still achieve a calendar year record high for exports.

Sales – which are mainly to Chinese aluminium firms – from its Bauxite Hills operation in Queensland will total 3.41mn wet metric tonnes (wmt) for 2022, below the guidance of 3.6mn-3.7mn wmt, the Brisbane-based firm said.

This is mainly because the loading of an export vessel was cancelled owing to the weather system in the Gulf of Carpentaria as well as component problems on a floating barge crane.

Metro, which will resume production in April 2023 after the rainy season, has agreements to sell 5.0mn wmt of bauxite in 2023 and is expanding its output capacity to 7mn wmt/yr.

By Angus Macmillan

Oman's refinery output down by 1pc

Oman's refinery output averaged 206,000 b/d in January-November, down by 1pc from a year earlier, according to the National Centre of Statistics and Information. The figure excludes naphtha and fuel oil, but includes LPG production.

The year-on-year decline was driven by a major turnaround at state-owned OQ's 198,000 b/d Sohar refinery earlier in the year, while output in September was constrained by a power outage at OQ's 106,000 b/d Mina Al Fahal refinery and at the industrial complex that houses the Sohar refinery.

Gasoil output dropped by 10.3pc on the year to 88,000 b/d in the January-November period. But gasoil production rebounded to 108,900 b/d in November from 89,700 b/d in October and 84,800 b/d in September. Oman's gasoil consumption rose to 41,000 b/d in January-November from 36,500 b/d a year earlier, and exports declined by 25pc to 45,500 b/d over the same period.

Oman produced 78,000 b/d of gasoline in the first 11 months of 2022, up from 73,000 b/d a year earlier.

Oman's jet fuel output rose to 21,000 b/d in the January-November period, up by 30pc from a year earlier.

Construction work on Oman’s 230,000 b/d Duqm refinery is 96pc complete, according to operator OQ8. Once operational, the refinery – which will produce primarily diesel, jet fuel, naphtha and LPG – will boost the sultanate’s refining capacity to beyond 500,000 b/d, from just over 300,000 b/d today.

By Elshan Aliyev

Lukoil refinery contracts 2023 crude transport

Russian independent Lukoil’s 47,800 b/d Petrotel refinery in Romania has signed a contract with pipeline operator Conpet for the transport of seaborne crude from the Black Sea port of Constanta in 2023, Conpet said.

The quantity of crude to be delivered to Petrotel was not disclosed. The 2023 contract has a value of 89.2mn Lei (\$19.2mn), up by around 4pc from the contract for 2022. Conpet will increase transport tariffs for Petrotel by around 13pc from January.

Romanian energy minister Virgil Popescu said in early December that Petrotel had found alternative sources of crude, alleviating concerns that the EU’s ban on Russian seaborne crude imports would affect local products supply. He gave no details on Lukoil’s supply sources.

Bucharest did not request an exemption from the EU’s ban, which took effect on 5 December. Petrotel had mostly imported Russian Urals crude through Constanta, but needed to secure other grades because of the embargo. It also takes some Romanian crude by rail.

Conpet said in September it expected to deliver 2.63mn t of imported feedstock to Petrotel from Constanta this year, up from a 2.48mn t forecast it made in February. Petrotel imported around 2.16mn t of crude in 2021.

By Bela Fincziczki

Petrobras advances Gaslub downstream project

Brazil’s state-owned Petrobras has approved engineering for its future fuels and lubricants plants in the Gaslub complex in Itaboraí, Rio de Janeiro state.

The units will produce 12,000 b/d of group II lubricants, 75,000 b/d of S-10 diesel and 20,000 b/d of low-sulphur jet fuel.

The project is in line with the company’s strategy to expand and modernise its refining capacity. The complex would be connected by pipelines to the Duque de Caxias refinery (Reduc), giving it the capacity to process a share of Reduc’s intermediate component production.

Petrobras still needs to conduct additional engineering

studies before making a final investment decision. The project is in line with the company’s efforts to increase fuel supplies on the domestic market and reduce imports, Petrobras said.

The announcement comes as Petrobras prepares for management changes, as president-elect Luiz Inacio Lula da Silva will begin his third term in office on 1 January. During his campaign, Lula promised to expand Petrobras’ downstream investments and reduce fuel imports.

Gaslub, which was originally planned to be a petrochemicals production complex, has suffered a series of delays in part because of corruption allegations resulting from the Operation Car Wash probe. The complex is scheduled to begin processing natural gas from pre-salt fields in 2024.

China’s titanium dioxide exports rise

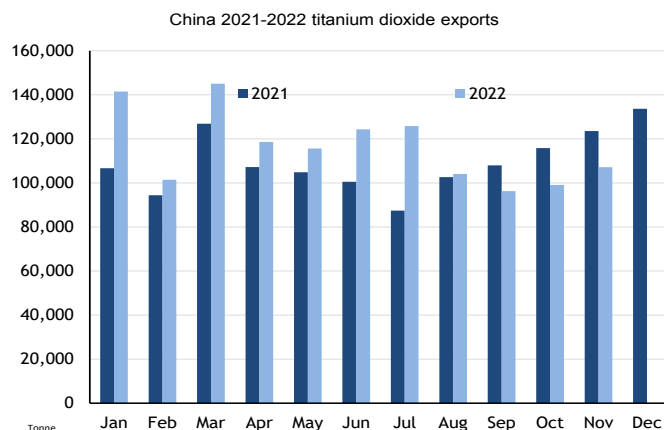
China’s exports of titanium dioxide rose during January-November with increased purchases from international consumers.

China exported 1.28mn t of titanium dioxide during January-November 2022, up by 8.5pc from 1.18mn t during the same period of 2021. The top six destinations in the first 11 months of 2022 were India, Brazil, South Korea, Russia, Vietnam and Turkey at 168,300t, 83,500t, 67,700t, 66,300t, 64,900t and 58,200t, respectively.

The country exported 107,200t of titanium dioxide in November, down by 13pc compared with 123,600t in November 2021, but up by 8.2pc from 99,100t in October, according to customs data.

Prices for 98pc anatase grade dioxide were stable from 29 December at 12,800-14,000 yuan/t (\$1,860-2,035/t) ex-works

China titanium dioxide exports 2021-22 (t)



and Yn14,000-15,000/t ex-works for dioxide 93pc rutile grade on 3 January, as most producers maintained their offer prices in the past few days because of lower profit margins.

Export prices were unchanged from 29 December at \$1,950-2,050/t fob on 3 January in response to limited buying interest from international consumers.

China’s Jan-Nov graphite flake imports up

China’s graphite flake imports rose during January-November, as Chinese buyers raised purchases on strong demand from the domestic anode material industry, while exports fell as export firms cut shipments because of tight supplies in China.

The country imported 151,500t over January-November, nearly tripling from 51,100t a year earlier, according to customs data. Imports in November more than doubled to 12,900t compared with 6,300t a year earlier.

But imports have been falling for three months since September as a result of unstable seaborne supplies, few shipping lines, shortage of containers and a potential weaker demand in response to reduced subsidiaries in China in 2023.

The country exported 94,700t of graphite flake during January-November, down by 14pc on the year, according to customs data. Exports in November were halved from a year earlier to 6,400t, and down by 17pc from October as a result of tight supplies in China and weaker buying interest from overseas buyers.

Tesla eyes more graphite from Syrah facility

US-based electric vehicle manufacturer Tesla has conditionally agreed to increase its offtake of natural graphite active anode material from Australian graphite firm Syrah Resources’ Vidalia vertically-integrated active anode materials production facility in US’ Louisiana state.

Subject to Vidalia raising its output capacity of purified spherical graphite to 45,000 t/yr from 11,250 t/yr, Tesla has exercised its option to increase its offtake by 17,000 t/yr to 25,000 t/yr at a fixed price for a four-year term, Sydney-based Syrah said. Syrah has already met specification conditions to supply 8,000 t/yr of offtake to Tesla, subject only to the start of production by 31 May 2024.

Syrah is targeting output to start in July-September 2023.

A definitive feasibility study on expanding output to 45,000 t/yr is underway and will be followed by engineering, procurement and construction phases.

Syrah, which also owns the world’s largest natural graphite mine at Balama in Mozambique, is among a handful of Australian firms aiming to reduce China’s stranglehold on the supply of active anode material which is essential for the anodes of electric vehicle batteries. Others include Talga Resources through its Vittangi project in Sweden, Renascor Resources through its Siviour project in South Australia, and Mineral Commodities through its Skaland and Munglinup graphite operations in Norway and Australia, respectively.

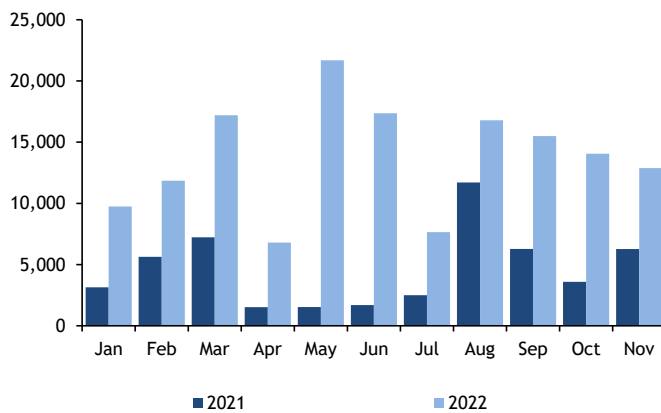
By Angus Macmillan

China’s BYD becomes largest EV producer

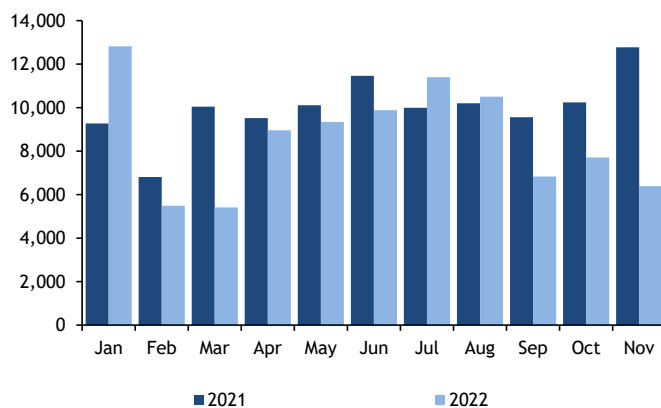
China’s new energy vehicle (NEV) manufacturer BYD reported record-high output and sales in 2022, surpassing US electric vehicle (EV) producer Tesla as the world’s largest EV producer.

BYD’s NEV production more than tripled from a year earlier to 1.88mn units in 2022, accounting for 99.8pc of the firm’s total vehicle production. Its NEV sales in 2022 were also slightly

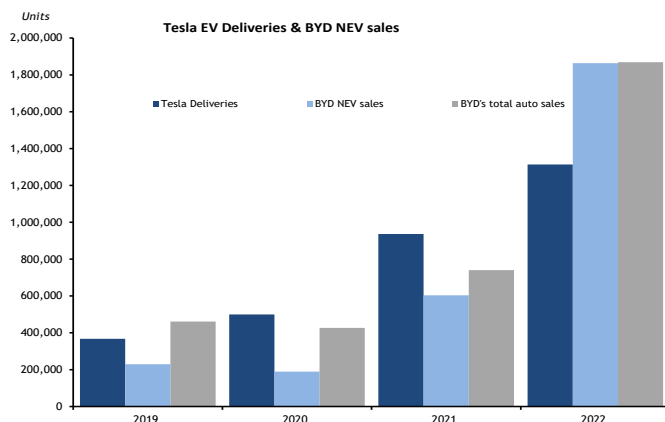
China graphite flake imports (t)



China graphite flake exports (t)



Tesla EV Deliveries & BYD NEV sales



more than three times that of the previous year at 1.86mn units, making up 99.7pc of the firm's total vehicle sales. [Tesla produced 1.4mn EVs in 2022](#) compared with 930,400 in 2021.

BYD's NEV output in December surged by 156pc from a year ago to 235,215 units, including 599 commercial NEVs and 234,616 passenger NEVs, among which battery electric vehicles (BEVs) increased by 135pc from a year earlier to 109,577, with plug-in hybrid electric vehicles (PHEVs) soaring by 182pc to 125,039 units.

No gasoline-fuelled vehicles were produced in December as BYD stopped producing them in March 2022 and has since focused on producing BEVs and PHEVs.

BYD sold 235,197 NEVs in December, the fourth consecutive month with sales above 200,000 units, up by 150pc from a year earlier. Its December sales include 599 commercial NEVs and 234,598 passenger NEVs, among which BEVs rose by 132pc to 111,939 and PHEV sales almost tripled to 122,659.

China's NEV production totalled 6.253mn units during January-November 2022, doubling from a year earlier, with sales also doubling to 6.067mn units over the same period, according to data from China's Association of Automobile Manufacturers (CAAM). The association earlier last year expected China's NEV sales to reach 9mn in 2023.

But the end of an extended state subsidy is likely to [slow China's NEV growth in 2023](#). The country will continue to waive the purchase tax for NEV. But this remains insufficient to ensure that producers are able to break even and many EV producers have consequently been indicating that auto prices will rise in 2023. BYD will raise prices for some models by 2,000-6,000 yuan/t (\$289-868/t) from 1 January 2023, following [a round of price hikes in late November](#).

Power batteries

BYD – also a major power battery producer in China – installed 11.152GWh of power and energy storage batteries in December and 89.836GWh during 2022, up by 137pc compared with 37.9GWh in the whole of 2021.

China's total output of power batteries during January-November reached 489.2GWh, up by 160pc from a year earlier, with installed volumes doubling to 258.5GWh over the same period.

China's Contemporary Amperex Technology, BYD and China Aviation LB were the top three power battery manufacturers in terms of installed volumes during January-November at 124.1GWh, 59.7GWh and 17.4GWh respectively, accounting for 48pc, 23pc and 6.7pc of the total volume.

China's Ennaiji launches VPS cathode plant

Chinese sodium-ion battery material producer Guangshui Ennaiji New Energy has launched first-phase production of vanadium phosphate sodium (VPS) cathode material in Guangshui county of Suizhou city in central China's Hubei province.

The first phase of the project has a 1,000 t/yr capacity for VPS cathode material. The whole project, which will be completed in three phases, has a 10,000 t/yr capacity for VPS cathode material. Other details including construction schedules and launch dates for the remaining two phases were undisclosed.

Guangshui Ennaiji is a wholly-owned subsidiary of Hubei Ennaiji Science and Technology, a high-tech enterprise that researches, develops, produces and sells anode and cathode materials for sodium-ion batteries.

Sodium-ion battery cathode material is designed to solve the contradiction between strong demand for power batteries, especially large-scale energy storage batteries, and limited lithium resources. Sodium-ion batteries are key to developing and utilising renewable energy such as wind and solar and building clean new energy structures and smart grids, Ennaiji said.

Power and storage battery manufacturers are pushing to develop technologies using less traditional metals, including sodium, iron and antimony, in light of rising demand and prices for staples cobalt, lithium and nickel. The Chinese government in August last year announced plans to promote the development of its sodium-ion battery industry during 2021-25, the period of the country's 14th five-year economic plan.

China's largest power battery manufacturer CATL in July last year unveiled its new sodium-ion batteries, expecting

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to build an industrial supply chain by 2023. Other battery manufacturers such as Huayang, Sunwoda, Guangzhou Great Power, Great Wall, Ronbay and Putailai have also set out plans to develop sodium-ion batteries.



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