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Argus Crude and Refined Products Outlook

Summary

North Sea Dated

- There are good reasons to expect prices to remain firm in the immediate future and we have upped our forecast accordingly. We now see North Sea Dated at $82/bl in the first quarter, and drifting lower to average $75/bl in the second half of 2022. There is a significant chance that prices could turn out higher than this.

Crude differentials

- Nigerian light sweet crude grades such as Bonny Light continued to draw strength last month from the disruptions in Libya, and also from Asia-Pacific buying and strong light distillate margins in Europe. And Nigerian grades are expected to continue to benefit from the situation in Libya, which in recent days has deteriorated, sending crude production below 800,000 b/d.
- Angolan grades — disproportionately reliant on Chinese demand — are being pressured by a lack of spot demand.

Product crack spreads and refining margins

- Gasoline cracks declined in all regions other than the Mediterranean, largely in line with the seasonal norm that sees rising gasoline stocks in winter. But naphtha cracks rose in all regions except the US Gulf coast, amid tight supply.
- Middle distillate cracks defied expectations in December by rising across the board, despite the advance of Covid-19's Omicron variant.
- HSFO cracks against regional benchmark crudes rose in all four of the main refining regions during December, reversing the trend seen in the previous two months.

Near-term price drivers

	Bullish	Bearish
Fundamentals	▲ OECD stocks well below their five-year average ▲ Production losses in Libya, Ecuador and Kazakhstan persist ▲ High natural gas prices may incentive gas-to-oil switching	▼ US shale production rising ▼ China pursuing hard lockdowns in more cities/regions ▼ Global air traffic still below 2019 levels thanks to Omicron
Sentiment	▲ Omicron variant seen as mild, government restrictions tapered in Europe and North America ▲ Progress in Iran talks sluggish ▲ Opec+ struggling to meet tapering commitment ▲ Fears that Kazakhstan unrest might impact crude output	▼ Omicron infections spreading in Asia-Pacific, triggering renewed restrictions ▼ Announcements of more SPR releases
Macroeconomics	▲ Resilient showing for December manufacturing PMI data ▲ Central banks flagging up fact that supply chain and inflationary pressures may be peaking	▼ Elevated November European PPI readings ▼ China real estate liquidity crisis continues ▼ Ongoing congressional delays for Biden's spending package ▼ US Fed pivot suggests rate hike by mid-2022; strong US dollar ▼ Potential fallout from Turkey financial crisis

Overview

The new year has started with a bang, with market bulls firmly back in control. Heading into the holiday period, prices had been under downward pressure, with the market nervously eyeing surging Omicron infection rates — in early December, the global seven-day moving average of new Covid-19 cases soared almost overnight to over 1mn, well in excess of the previous peak of around 800,000 at the height of the Delta wave. But having fallen as low as $68/bl in late December, North Sea Dated has since recovered strongly and is currently trading at over $80/bl.

There are reasons to expect prices to remain firm in the immediate future, and we have upped our forecast accordingly. We now see North Sea Dated at $82/bl in the first quarter, before drifting lower to average $75/bl in the second half of 2022. There is a significant chance that prices could turn out higher than this. Latest data through mid-December show net speculative length on Ice and Nymex had fallen to the lowest since September 2020 and was 46pc down on the level seen in mid-2021. There is scope for a period of sustained buying should bullish sentiment continue to build.

Market fundamentals suggest that this could well happen. As we have pointed out previously, OECD crude and product stocks — basis US, Japan and the EU 16 — are now very low, having fallen steadily since mid-2020 to a point in November where they were 6pc — or 158mn bl — below the 2014-19 five year average (*see graph*).

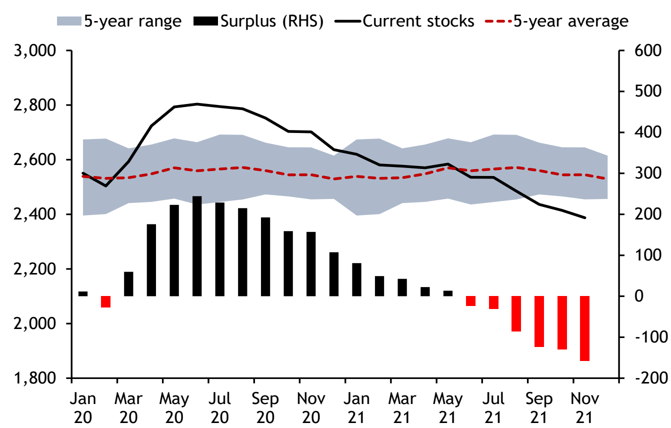
Meanwhile, global demand has largely returned to pre-pandemic levels, even if some of the keener expectations for last summer's driving season in the US and Europe were wide of the mark. Global jet fuel demand is still weak, with air traffic continuing to trend around 50pc below 2019 levels. But on the basis of data for the US, Europe, Brazil, India and Mexico, gasoline demand is roughly back to where it was in 2019 and gasoil/diesel demand is higher. China's uncompromising approach to dealing with the slightest sign of Covid infection means demand in this key market is still relatively weak, but on a global basis we estimate demand to be only around 2mn b/d below the same period in 2019 (*see graph*).

This view includes around 500,000 b/d of additional demand from consumers opting to use oil in place of high-priced gas. There is no hard evidence regarding the extent of this trend, but strong fuel oil prices suggest that some fuel switching has been taking place in the power generation sector. Stronger than expected gasoil/diesel prices might also serve to confirm this.

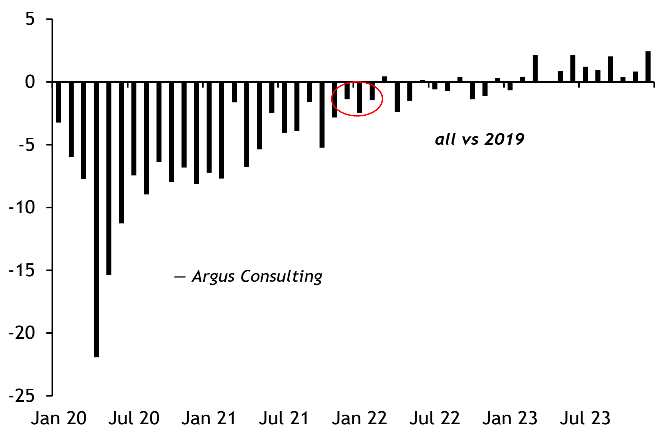
Opec+ has been working hard since the middle of last year to pull stocks back to a more balanced position, but — in terms of the key OECD commercial inventory metric — so far without success. Since the start of the tapering process designed to return to the market the cuts introduced in April-June 2020, Opec+ production has increased by 3.1mn b/d. But the rise is some 700,000 b/d less than it would have been had every country upped its output to the permitted ceiling.

On top of this, there has been a spate of unexpected production outages. Libya, Ecuador and Nigeria have all experienced problems that have forced down production, with

Total OECD oil stocks *mn bl*



Monthly global demand change vs 2019 *mn b/d*



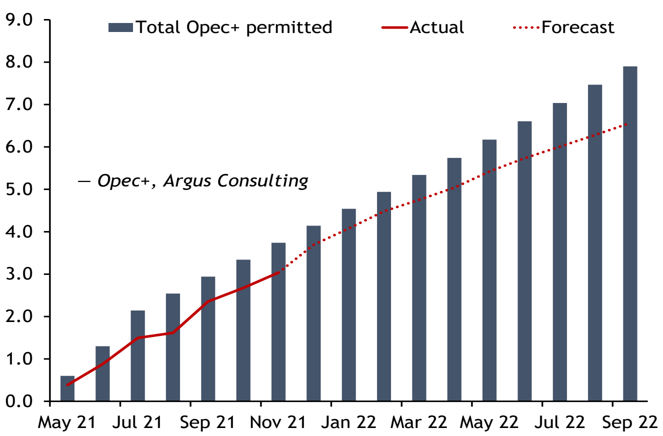
Summary of global oil balance												mn b/d
	1Q20	2Q20	3Q20	4Q20	2020	1Q21	2Q21	3Q21	4Q21	2021	2022	2023
Demand	93.98	83.39	92.80	93.25	**90.85**	94.11	94.71	97.21	97.74	**95.94**	**99.27**	**101.19**
Supply	99.93	91.63	90.57	92.02	**93.54**	91.75	93.83	96.15	98.06	**94.95**	**102.14**	**105.57**
Opec crude	28.28	25.55	23.78	24.85	**25.62**	24.96	25.45	26.87	27.83	**26.28**	**29.78**	**31.53**
Opec NGL and condensate	5.85	5.85	5.85	5.85	**5.85**	5.81	5.81	5.81	5.81	**5.81**	**5.76**	**6.16**
Non-Opec crude and NGL	60.74	55.19	55.23	56.05	**56.80**	56.16	56.88	57.40	58.79	**57.31**	**60.82**	**62.03**
Other supply	5.07	5.04	5.71	5.26	**5.27**	4.82	5.68	6.07	5.63	**5.55**	**5.78**	**5.86**
Global balance*	5.93	7.76	-2.12	-1.12	**2.61**	-2.41	-0.64	-0.94	0.47	**-0.88**	**2.87**	**4.39**

**equivalent to global stock change*

close to 700,000 b/d lost in December. Output in Ecuador and Nigeria, and possibly also Libya, is expected to return to normal imminently, but these constraints have further delayed the rebalancing process. Now, cold weather in the US and Canada threatens to stymie production, while the uncertain situation in Kazakhstan also has the potential to reduce supply. So far, the short duration of the outages means the volumes involved are relatively small, but any loss of supply when stocks are low and the Opec+ group — the key marginal supply source — is struggling to raise output only fuels the bullish narrative. Any threat to Kazakhstan's 1.6mn-1.7mn b/d of output would clearly be a different matter entirely.

Other less tangible factors help to complete the upbeat outlook. Talks with Iran over the resumption of the Joint Comprehensive Plan of Action — and a possible increase in Iranian exports — are continuing, but progress is sluggish. We now assume that the market will not see higher Iranian exports until the year's end, and possibly later. And fears over the potential impact of Omicron have also receded somewhat. Original reports that it is a highly infectious variant, but tends to lead to lower rates of hospitalisation and

Opec+ quotas vs actual output *mn b/d*



mortality, are now being born out, so the potential for a significant hit to global oil demand appears diminished.

What headwinds there are to demand seem light. Omicron is now spreading widely in Asia, but there is no sign that countries will adopt the aggressive Chinese approach to containment. More tangible is the US-led plan for a number of countries to release up to 60mn bl of stock from their strategic reserves. Only around 5mn bl is confirmed so far, and we have not assumed any further release beyond that — 60mn bl is not a small amount and would add 670,000 b/d to supply if released over three months and 330,000 b/d over six months. It is doubtful that this would be enough to cool the market in any meaningful way.

The inability of Opec+ to raise output in line with its mandate has slowed the rebalancing process and focused attention on the group's real ability to continue raising production. This, with the apparent unwillingness of other producers to make up the shortfall, is key to informing current sentiment. Given wellhead capacity constraints — particularly in Russia — the shortfall in Opec+ production is likely to increase in the coming months (*see graph*). By the end of the tapering process in September, we see the shortfall at 1.3mn b/d.

This could add to the upward pressure on prices. At the very least, it is likely to lend support. But while there is no doubt that the first quarter is tighter than previously expected, market fundamentals for 2022 as a whole appear an invitation to caution. Global demand is forecast to increase by 3.3mn b/d, but combined Opec+ and other non-Opec supply could grow by as much as 6mn b/d. The market looks structurally oversupplied on this basis, with the imbalance becoming increasingly evident as the year progresses — assuming that Opec+ sticks with its current tapering strategy. Prices are likely to be squeezed as the year unfolds.

Forecast crude prices									$/bl
	Dec	Jan	Feb	Mar	1Q22	2Q22	2022	2023	2024
Ice Brent	74.80	82.50	82.60	81.60	82.20	77.60	**77.70**	**73.70**	**70.80**
Nymex WTI	71.69	79.50	79.60	78.60	79.20	74.60	**74.70**	**70.70**	**67.80**
North Sea Dated	74.01	82.00	82.00	81.00	81.70	77.00	**77.10**	**73.10**	**70.20**
Urals NWE	72.69	80.30	80.30	79.00	79.90	75.00	**75.20**	**71.00**	**68.00**
Urals Med	73.07	80.80	80.60	79.40	80.30	75.30	**75.50**	**71.50**	**68.40**
CPC Blend	73.67	81.30	80.70	80.00	80.70	75.60	**75.80**	**71.40**	**69.00**
Bonny Light	74.40	82.70	82.80	81.60	82.40	77.80	**77.90**	**74.40**	**71.60**
Dalia	74.32	82.30	82.52	81.36	82.06	77.29	**77.62**	**73.79**	**70.50**
WTI Midland	72.36	80.30	80.20	79.00	79.80	75.10	**75.10**	**70.90**	**68.10**
WTI Houston	72.86	80.80	80.70	79.50	80.30	75.60	**75.60**	**71.40**	**68.60**
LLS	73.52	81.70	81.70	80.20	81.20	75.80	**76.10**	**72.30**	**69.60**
Mars	71.02	78.40	78.30	77.30	78.00	73.60	**73.30**	**69.20**	**66.20**
WCS Hardisty	54.49	65.04	66.60	65.24	65.63	61.37	**61.10**	**58.96**	**57.84**
WCS Houston	66.58	74.82	75.83	74.47	75.04	70.60	**70.38**	**66.32**	**63.21**
Dubai	73.13	81.50	81.20	79.90	80.90	75.50	**75.90**	**71.30**	**68.10**
Murban	74.52	82.29	82.43	81.41	82.04	76.91	**77.17**	**73.08**	**70.12**
ESPO Blend	74.68	82.60	83.20	81.70	82.50	77.90	**78.10**	**74.10**	**71.00**

Forecast crude differentials									$/bl
	Dec	Jan	Feb	Mar	1Q22	2Q22	2022	2023	2024
Ice Brent vs North Sea Dated	0.80	0.50	0.60	0.60	0.60	0.60	**0.60**	**0.60**	**0.60**
Urals NWE vs North Sea Dated	-1.31	-1.70	-1.70	-2.00	-1.80	-2.00	**-1.90**	**-2.10**	**-2.20**
Urals Med vs Urals NWE	0.38	0.50	0.30	0.40	0.40	0.30	**0.30**	**0.40**	**0.40**
Urals Med vs North Sea Dated	-0.94	-1.20	-1.40	-1.60	-1.40	-1.70	**-1.50**	**-1.70**	**-1.80**
CPC Blend vs North Sea Dated	-0.34	-0.70	-1.30	-1.00	-1.00	-1.40	**-1.30**	**-1.70**	**-1.20**
Bonny Light vs North Sea Dated	0.40	0.70	0.80	0.60	0.70	0.80	**0.80**	**1.30**	**1.40**
Dalia vs North Sea Dated	0.31	0.30	0.50	0.40	0.40	0.30	**0.50**	**0.70**	**0.30**
Nymex WTI vs Ice Brent	-3.11	-3.00	-3.00	-3.00	-3.00	-3.00	**-3.00**	**-3.00**	**-3.00**
WTI Midland vs Nymex WTI	0.67	0.70	0.60	0.40	0.60	0.50	**0.40**	**0.20**	**0.30**
WTI Houston vs Nymex WTI	1.17	1.20	1.10	0.90	1.10	1.00	**0.90**	**0.70**	**0.80**
LLS vs Nymex WTI	1.83	2.20	2.10	1.60	2.00	1.20	**1.40**	**1.60**	**1.80**
LLS vs Mars	2.50	3.30	3.40	2.80	3.20	2.20	**2.80**	**3.10**	**3.40**
Mars vs Nymex WTI	-0.67	-1.10	-1.20	-1.20	-1.20	-1.00	**-1.40**	**-1.50**	**-1.60**
WCS Hardisty vs Nymex WTI	-17.20	-14.50	-13.00	-13.40	-13.60	-13.20	**-13.60**	**-11.70**	**-10.00**
WCS Houston vs Nymex WTI	-5.11	-4.70	-3.80	-4.10	-4.20	-4.00	**-4.30**	**-4.40**	**-4.60**
Dubai vs Ice Brent	-1.67	-1.00	-1.40	-1.60	-1.30	-2.10	**-1.80**	**-2.40**	**-2.70**
Murban vs Ice Brent	-0.29	-0.20	-0.20	-0.20	-0.20	-0.70	**-0.50**	**-0.60**	**-0.70**
ESPO Blend vs Dubai	1.55	1.10	2.10	1.80	1.60	2.50	**2.20**	**2.80**	**2.90**

Macroeconomics and financial markets

The new year has started brightly across the commodity complex, with prices in the first week of 2022 generally 5-6pc up on where they ended 2021. In the December issue of this report, we were weighing up the uncertainties concerning the severity of the new Omicron variant of Covid-19, its likely impact on oil demand and how this might influence Opec+ policy regarding monthly supply increases.

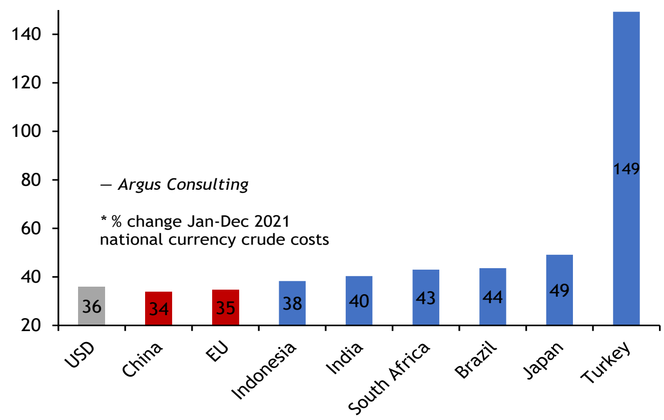
Since then, however, bullish upgrades to our own and others' fundamentals forecasts, evidence of tight OECD oil stocks, and signs that Omicron is less dangerous than previous variants have combined to paint a more constructive outlook for 2022. It is too early to be definitive, but for now the trend of tapering global mobility and social restrictions with each successive Covid-19 wave seems to be holding.

While that is supportive of demand, recent crude price strength seems to have taken its cue more from inventory tightness and supply-side uncertainty. Supply concerns have intensified as ever-present geopolitical risks flare — turmoil in Kazakhstan, a potential economic crisis in Turkey, border tensions in eastern Ukraine, and seemingly stalled nuclear negotiations with Iran.

With each of these countries being an important energy producer or transit state, the instability has fed through to support prompt prices. But geopolitics aside, we are still a long way from clarity over economic and financial market prospects in the year ahead, amid distortions that are affecting everything from consumer spending, retail and manufacturing costs to trade flows and labour markets. Intense uncertainty about what 2022 holds has kept safe-haven gold supported at record highs of more than $1,700/oz, although the price has fallen recently.

Oil demand has been stimulated by winter fuel switching as utilities and industry scramble to meet their requirements at a time when spot gas values in Europe and Asia-Pacific remain stubbornly above $30/mm Btu. However, short-term headwinds and uncertainties for oil demand also persist, including the disruption that those same energy spikes are causing to industrial activity and consumer confidence, the spectre of surging inflation and imminent interest rate increases, signs of Chinese economic growth slowing amid a real-estate sector liquidity crisis, and the persistently strong US dollar.

2021 crude cost increases in national currency*



The short-term relationship between the dollar and crude prices is erratic. But steady supply chain and labour market disruptions resulting from the pandemic have ratcheted up inflation expectations for 2022. While sticking to the view that elevated inflation is likely to be a cyclical rather than a structural issue, central banks around the Atlantic basin — Turkey aside — are nonetheless starting to tighten monetary policy. The Bank of England in December became the first key central bank to start raising rates, and the US Federal Reserve could follow suit as early as March or April.

All else being equal, higher US interest rates are supportive the dollar. The impact on energy prices that are largely denominated in dollars is already being felt. Whereas dollar-denominated crude import costs, and those for China and the EU in their national currencies, rose by around 35pc between January and December 2021, the corresponding rise for Indonesia, India, South Africa, Brazil and Japan was 40-50pc, reflecting the strengthening greenback. Meanwhile Turkey, pursuing a costly monetary experiment that seeks to cut interest rates in the face of soaring inflation, was paying two-and-a-half times more for crude in December than it did in January 2021.

The dollar is approaching its strongest level since the start of the pandemic, and is likely to remain supported as the US Fed further unwinds stimulus and begins to raise rates through 2022. Despite an imperfect inverse relationship, dollar strength could check commodity demand and prices in the year ahead, not least for oil among highly indebted and import-dependent emerging economies.

Crude futures analysis

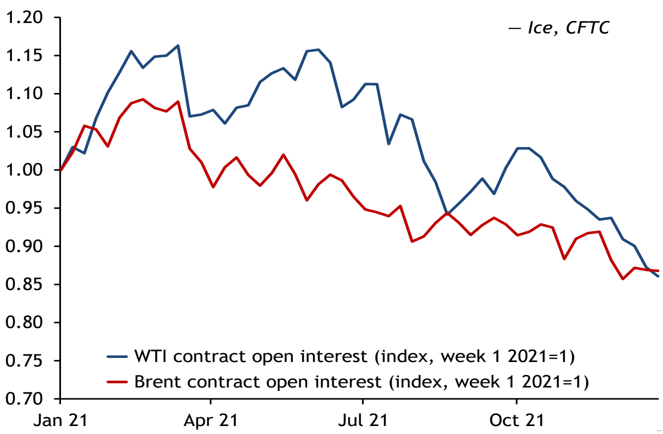
As January is named after Janus, Roman god of gates, doorways, beginnings and endings, and since Janus was usually depicted with back-to-back faces, it is incumbent upon us to look both backwards at 2021 and forwards to the new year.

Unsurprisingly, oil demand rebounded last year, growing by 6pc, slightly above world economic growth of 5.6pc. Given the ravages of the waves of Covid-19 that characterised 2021 and the 72pc year-on-year rise in oil prices, the market's revival is — on the face of it — impressive. Yet, how could oil demand fail to surge after 2020's huge 9.2pc decline, and how could the market not tighten last year after a modest 0.8mn b/d increase in non-Opec output that followed a 3mn b/d price-related fall in 2020? The zero-stock-change call on Opec in 2021 reached 4.6mn b/d, which after subtracting the previous year's 2.9mn b/d global inventory build, led to a 1.6mn b/d incremental need for Opec crude. In the event, Opec increased its output by 0.6mn b/d, resulting in a 1mn b/d global stockdraw, which helped to reduce the massive 15-day global commercial stock cover increase in 2020 — but not by nearly enough. World commercial cover in 2021 remained around 10 days above the 'normal' 2019 average. Indeed, this is the key question for 2022 — will Opec have the discipline to restrict its output to the incremental call on Opec of 0.4mn b/d? If not, stock cover will remain surplus to normal requirements.

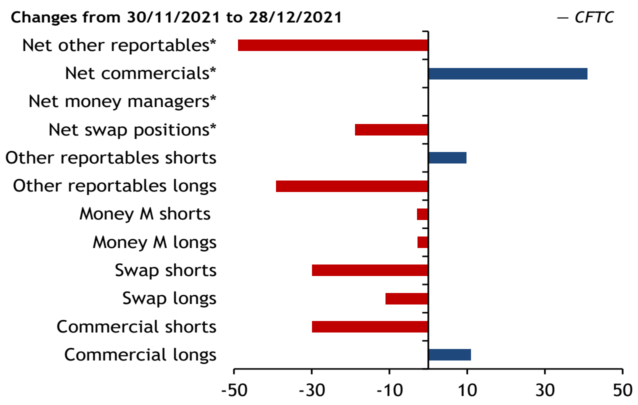
In these circumstances — with global commercial inventory cover likely to remain well above 52 days — the deep-seated concerns of some about oil's weakness seem justified, despite the market's current preoccupation with OECD inventories bumping along the bottom of the five-year average. It is worth remembering that OECD oil consumption these days is around 46pc of global oil use and cannot, therefore, be construed as the main determinant of global inventory cover. Pockets of tightness are evident in the global supply system, hence the long-lasting backwardation, but average forward time spreads for Brent are now firmly negative at minus $6/bl, minus $10/bl and minus $12/bl for one, two and three years, respectively, suggesting ample supply going forward. What is interesting, however, from the perspective of both of the world's main oil futures markets, is the downward trend in aggregate open interest during 2021 (*see graph*). After an initial rise until mid-March in both, and another surge in WTI futures up until early June, the decline in both hubs was steady, ending the year 15pc below where it had started out. Open interest usually correlates with oil demand-supply volumes as hedgers wish to cover their physical positions, bearing in mind that for every long position there is a corresponding short one. Growing oil demand means rising open interest — all other things being equal — but oil price movements play a significant role too, affecting the rise and fall of open interest.

WTI increased by $26.20/bl, or 43pc, in 2021, when total open interest declined by 302mn bl. Facing rising prices, the consumer hedgers on Nymex increased their longs by 69mn bl during the year, but the money managers decreased their longs, accounting for 36pc of the total fall in open interest, presumably taking profits in the bull market, as did the other reportables, which accounted for 35pc of the aggregate decline in open interest positions. On the short side during

Weekly WTI and Brent total open interest



Nymex WTI: Changes in open interest positions *mn bl*



*swap dealers are net short, commercials, money managers and other reportables are net long.

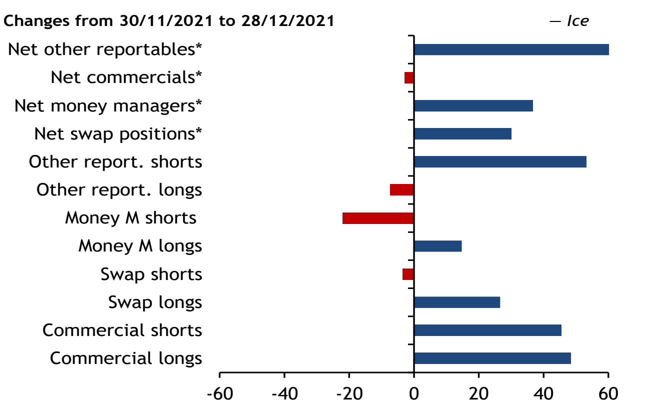
2021, the producer hedgers on Nymex reduced their positions by 68mn bl, or 22pc of the total, a sensible response to oil price increases, while the swap dealers cut their shorts by 86mn bl, or 28pc, responding to their producer clients' waning interest in hedging in a bull market. What about the movements in open interest in December, though, when there was a modest rally of 3.2pc in WTI? As our graph shows, the producer hedgers reduced their shorts by 30mn bl to cut their losses as WTI rose, as did the swap dealers, whereas the other reportables reduced their longs by 39mn bl, or 21pc, presumably taking profits on their previous purchases. What certainly catches the eye is the almost complete lack of activity from money managers on Nymex, who reduced their longs and shorts by 1pc and 4pc, respectively, leaving their net long position unchanged — a clear example of waiting to see where the oil price wind blows before committing fresh funds.

The decline in aggregate open interest in Brent futures during 2021 was of a similar magnitude — 330mn bl — to the fall in Nymex's total open interest. The rise in the Brent spot price was also substantial, at $24/bl or 39pc, but whereas the consumer hedgers on Nymex increased their longs in an overall bull market, the same hedgers on Ice reduced their long positions by 114mn bl, representing 35pc of the decline in aggregate open interest. Such a response to rising oil prices implies profit taking on a large scale on the understanding that the bull run will probably peter out, as indeed happened with Brent in December. Other big declines in Ice open interest during 2021 occurred among the swap dealers' longs — 30pc of the total decline — and the money managers' long positions — 25pc — with both groups deciding to take profits at various stages during the long 2021 bull-run.

Brent spot prices barely changed in December, making many participants wonder what might happen in 2022. On the one hand, the global oil inventory overhang is unlikely to dissipate any time soon, at least while Omicron continues to threaten. On the other hand, the virus might retreat much more swiftly than anticipated, leaving world growth at a healthy 5pc. Interestingly, in view of the uncertainty, both groups of hedgers on Ice increased their positions in December by similar amounts — the consumers guarding against price rises, and the producers covering some of their prospective output, fearing price falls (*see graph*).

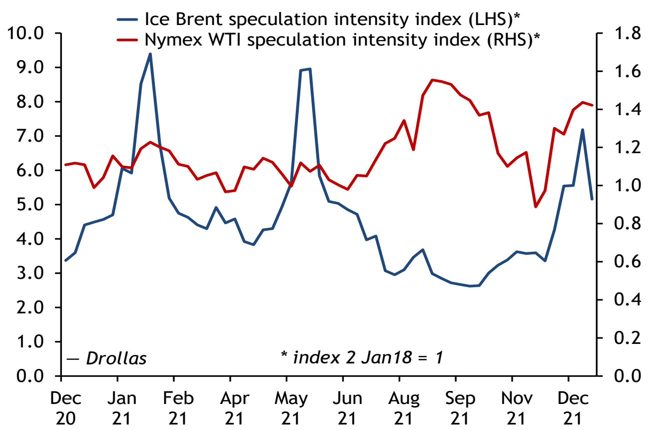
December's other big change in the Brent market was a very large increase, 53mn bl or 26pc, in the shorts of the other reportables, increasing their net short position by 51pc in an obviously significant bear play. The money managers, by contrast, increased their net long position by 22pc, underlining their faith in a bull price run. Contrasting bear and bull plays on Ice illustrate differing views about the likely trajectory of the oil price — but do they cancel out, or are they likely to intensify speculation? Regarding Brent, the Drollas speculation intensity index rose considerably from a low in early October to a high in late December (*see graph*). Note, though, that in the last week of December the Brent intensity index suddenly fell to a level last seen in mid-June, but still much higher than in September. Speculation in the WTI contract on Nymex remained relatively stable from January until the end of June, rising substantially thereafter to reach a level almost 60pc higher — probably as a result of the disruptive effects of Hurricane Ida — although it subsequently shed these gains. From mid-November, the speculation intensity of the WTI contract increased along with Brent's, but unlike Brent's it has remained high.

Ice Brent: Changes in open interest positions *mn bl*



*commercials and other reportables are net short, swap dealers and money managers are net long.

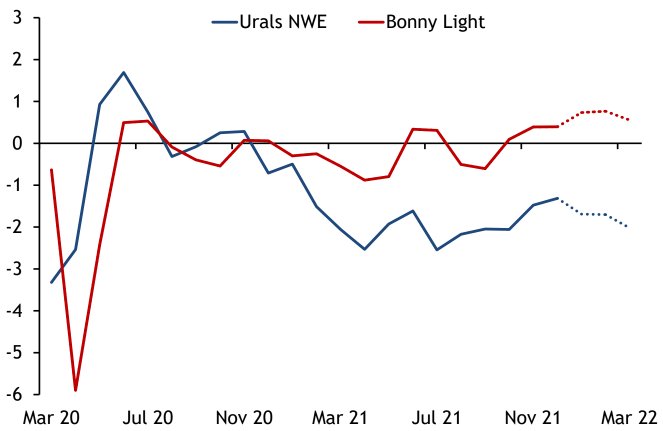
Brent & WTI: Speculation intensity indexes



Northwest Europe

North Sea grade Forties lost ground in December, averaging a premium of 23¢/bl to North Sea Dated, amid weak interest in prompt cargoes and a lack of buying interest in Asia-Pacific. But Forties could find strength this month because flows of Atlantic basin crude to Asia-Pacific could rise, with the front-month Brent-Dubai EFS — Ice Brent's premium to Dubai swaps — recently falling to its narrowest since May. A narrow EFS makes Atlantic basin crude more attractive to buyers in Asia-Pacific.

Urals cif NWE and Bonny Light vs Dated *$/bl*



Urals cif Rotterdam values increased slightly from November to a $1.30/bl discount to Dated last month. But the Russian medium sour grade has lost ground again in recent days, with its discount widening to $1.80/bl on plentiful supplies and rising competition from regional rivals.

Combined Urals loadings from Baltic and Black Sea ports are due to rise by 8pc on the month to 1.65mn b/d in January. Baltic Urals exports are scheduled 7pc up, with Primorsk due to load thirty-seven 100,000t shipments for an average of 857,000 b/d, up by 19pc. But at Ust-Luga, 24 cargoes of the same size will load for an average of 557,000 b/d, which is 8pc down than December.

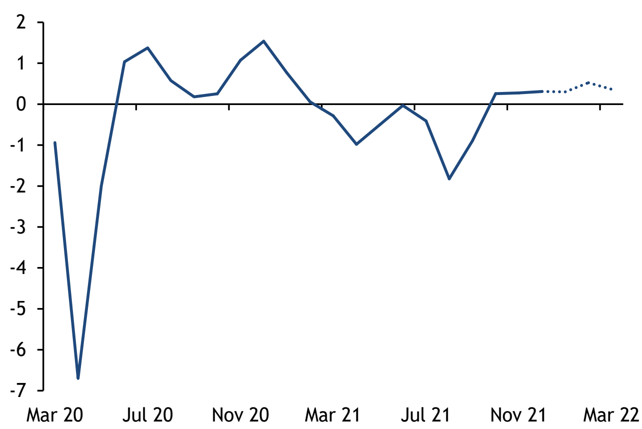
The rise in overall January volumes seems for now to be outweighing any potential support from falling natural gas prices. High natural gas prices push up hydrogen values, and this leads to a deterioration in desulphurisation economics for refineries, eroding sour crude prices.

Nonetheless, there are reports that Unipec could be planning to ship three Baltic Urals cargoes to China. Buying interest from the key eastbound arbitrage outlet could support Urals prices. Baltic Urals could also make gains from the lack of offers for Black Sea-loading shipments of the grade — something that is prompting buyers in the Mediterranean to seek Baltic cargoes.

Nigerian light sweet crude grades such as Bonny Light continued to draw strength last month from the disruptions in Libya, as well as Asia-Pacific buying and strong light distillate margins in Europe. And Nigerian grades are expected to continue to benefit from the situation in Libya, which in recent days has deteriorated, sending crude production below 800,000 b/d.

Values for other west African crude — including Angolan grades, which are disproportionately dependent on Chinese demand — are being pressured by a lack of spot demand. The prices of Angolan medium sweet Cadinda and heavy sweet Dalia have recently been pegged at a premium of 30¢/bl to North Sea Dated, down by 10¢/bl on assessments two weeks ago. Ghanaian flagship medium sweet Jubilee, which also frequently finds an outlet with Chinese refiners, is also being assessed lower, while Congolese flagship grade Djeno has been heard offered close to a discount of $1/bl to Dated. Demand did emerge recently from South Africa, India and Brazil for Angolan and other west African grades, but it usually takes strong Chinese demand to push many of them higher, and this is lacking in the current trading cycle. Meanwhile, the final version of Angola's February loading programme shows only a small reduction in exports — to 1.1mn b/d, down by 50,000 b/d from January.

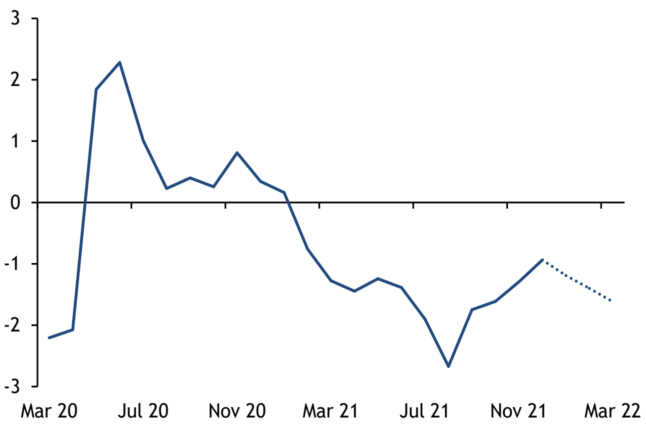
Dalia vs North Sea Dated *$/bl*



Mediterranean

Urals Mediterranean values strengthened last month against North Sea Dated, with less supply coming out of the Black Sea. Urals exports from Novorossiysk have been set slightly lower on the month in January, at 239,000 b/d.

Urals cif Med vs North Sea Dated ***$/bl***

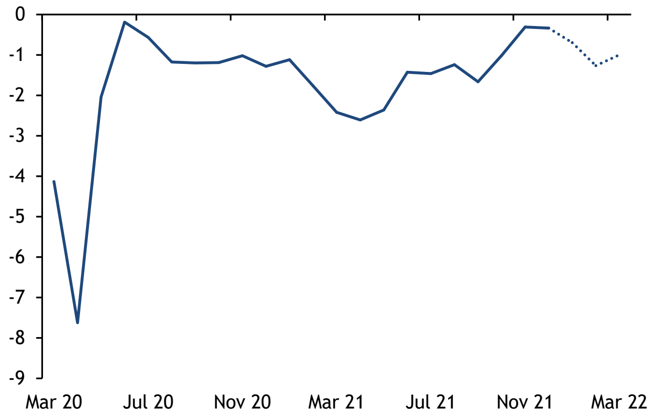


Sour crude supply in the Mediterranean might be limited in the near term — until markets adapt to Iraqi state-owned marketer Somo's decision to stop exporting Basrah Light from January. *Argus* tracking indicates that total Basrah exports to northwest Europe and the Mediterranean averaged 438,000 b/d in January-November 2021, with Basrah Light making up the smallest share of the three Basrah grades, at 24pc. The figure excludes volumes sent to Sidi Kerir in Egypt, which can remain in storage or load for Europe or the Americas. It remains to be seen what Mediterranean refiners will do this year to make up for the lack of Basrah Light. Some might choose to up their purchases of Basrah Medium and Basrah Heavy, but those preferring a lighter slate could look to replace Basrah Light with alternatives from other Mideast Gulf producers. Urals could benefit from the absence of Basrah Light, although its gravity is closer to Basrah Medium. Mediterranean refiners seeking sour supplies will have more choice if and when US sanctions against Iranian exports are lifted. A new round of talks aimed at reviving the Iran nuclear deal began on 27 December.

Light sour CPC Blend maintained a narrow discount of around 30¢/bl to Dated in December amid Libyan upstream disruptions. But the uplift from halted Libyan supplies might now be fading as the market adjusts. Mediterranean refiners have recently started to source more medium and light sweet crude from west Africa. January-loading exports of CPC Blend have now been finalised at 1.425mn b/d, about 6pc lower than the December plan.

Suezmax shipments, which are typically reserved for sale outside the Mediterranean market, will account for just 25pc of the January CPC Blend programme. And demand for January-loading shipments from staple buyers east of Suez appears to be holding up for the time being. However, a move by Abu Dhabi's Adnoc's to trim its February official formula price for Murban crude — for which CPC Blend can act as a direct replacement — could limit arbitrage interest for the latter in Asia-Pacific over the coming weeks.

CPC Blend vs North Sea Dated ***$/bl***



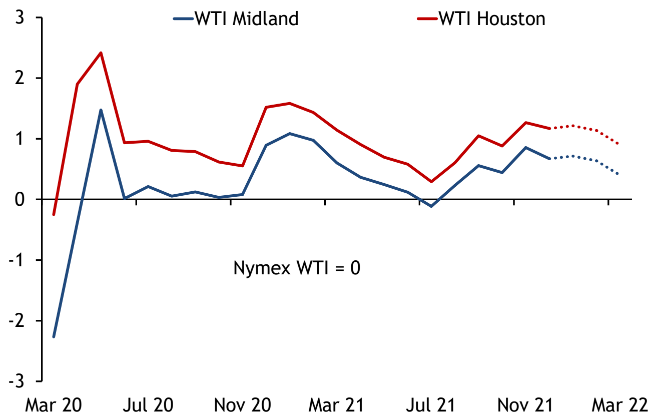
The price of Algerian light sweet Saharan Blend rose in December and is forecast to remain at a hefty premium to Dated as a result of strong light distillate margins and the loss of Libyan supplies.

Light sweet crude availability and pricing in the Mediterranean will rest on Libya's ability to overcome its production problems. State-owned NOC had aimed to lift output to 1.45mn b/d in 2021, after 2020's ceasefire agreement ended more than a year of hostilities and a months-long blockade on crude exports. But the political situation remains fragile and a number of infrastructure and labour problems have prevented NOC from achieving its target. *Argus* estimates that Libya produced just 1.12mn b/d in November. And by 4 January, production had slipped below 800,000 b/d as maintenance in the east of the country compounded shutdowns caused by blockades at four fields in the west.

US

Average WTI Houston and Midland premiums against the Nymex WTI Cushing benchmark fell on the month in December, despite the fact that US Gulf coast crude stocks fell and Cushing stocks rose. WTI at the US Gulf coast fell less than WTI Midland after the US government announcements that there would be flexibility over the timeline of upcoming releases from the Strategic Petroleum Reserve (SPR).

WTI Midland and Houston vs Nymex WTI *$/bl*



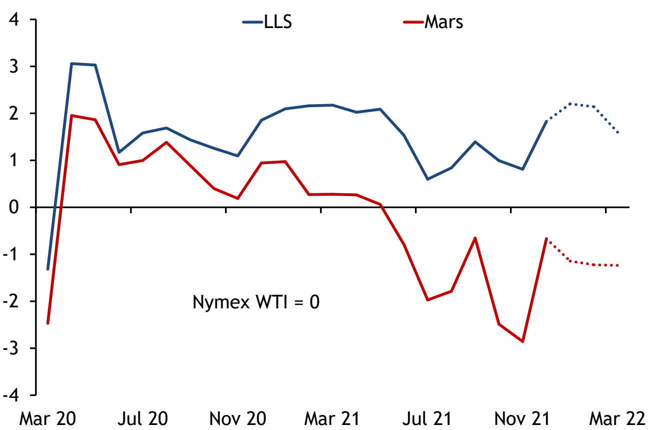
December's wider WTI-Ice Brent spread and lower freight rates also helped WTI Houston values as the export arbitrage started looking more attractive on paper. And the Libyan outages increased demand for US crude in Europe.

LLS and Mars priced in Louisiana also gained against Nymex WTI last month, reaching seven-month highs against the US benchmark. Medium sour Mars' discount to the Cushing basis narrowed by almost $3/bl to an average of 50¢/bl, partly as a result of higher Saudi official selling prices to the US and Asia-Pacific. Values were also bolstered by increased local demand and expectations of a flexible SPR release schedule.

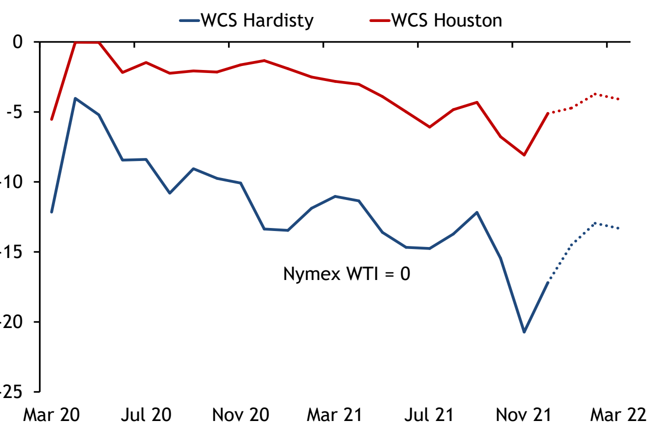
Canadian heavy crude prices rose against Nymex WTI in Hardisty, Alberta, last month after a major export pipeline resumed service on 5 December. WCS at Hardisty averaged a $16/bl discount to Nymex WTI, up from a discount of $19/bl in November after the 300,000 b/d Trans Mountain crude pipeline that connects Edmonton, Alberta, to the west coast came back on stream. The line was shut for three weeks because of heavy rain, flooding and mudslides in the western Canadian province of British Columbia. Meanwhile, with the ramp-up of Enbridge's 760,000 b/d Line 3 replacement project from Alberta to Wisconsin, additional volumes have flowed to the US Gulf coast as part of the 370,000 b/d capacity expansion that went live on 1 October. In general, heavy sour grades in the Americas have gained recently on stronger US and Asia-Pacific demand and as Ecuador cut sour production because of the ongoing impact of erosion on crude pipeline integrity.

WCS in Alberta and Houston will find further support as the Capline reversal enters full service this month. A reversed Capline supports Canadian crude prices at the Texas Gulf coast and in Cushing, Oklahoma, as other markets will now compete with more direct pipeline buyers in Louisiana. Capline started interim service from Patoka, Illinois, to St James, Louisiana, on 18 December, with full initial flows of 102,000 b/d starting 1 January. The line used to carry up to 1.2mn b/d of mostly imported crude north to Chicago area refineries.

LLS and Mars vs Nymex WTI *$/bl*

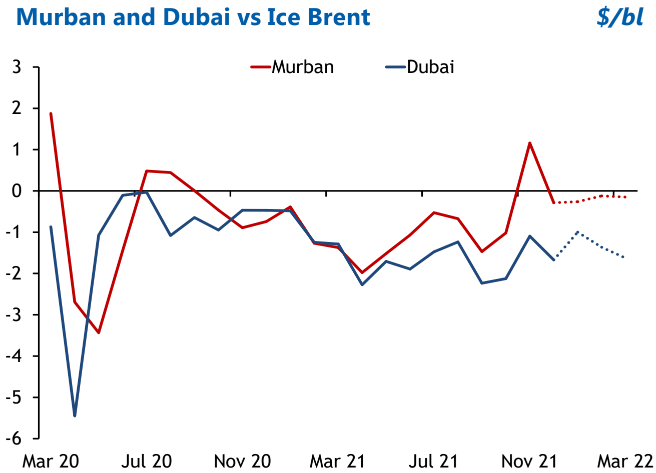


WCS vs Nymex WTI *$/bl*



Asia-Pacific

Medium sour Dubai and light sour Murban lost ground against Ice Brent in December as Asia-Pacific demand weakened and Mideast Gulf crude supply continued to grow.



Mideast Gulf crude exporters are likely to face more competition in the short term as flows of Atlantic basin crude to Asia-Pacific could rise, after the front-month Brent-Dubai EFS — Ice Brent's premium to Dubai swaps — fell in December to $2.94/bl, the narrowest monthly average since March 2021. A narrow EFS makes Atlantic basin crude more attractive to buyers in Asia-Pacific.

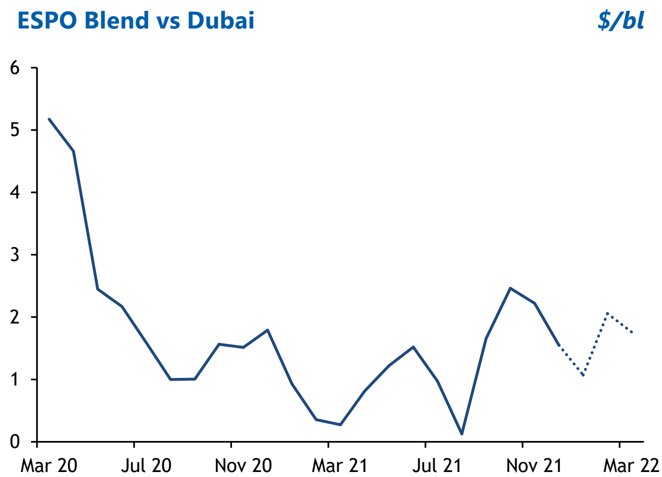
Meanwhile, however, Saudi Aramco slashed official formula prices for all its February-loading crude exports to Asia-Pacific. This followed a narrower Dubai backwardation as supplies increased and uncertainty over the Omicron variant of Covid-19 weighed on sentiment.

Aramco cut the February Asia-Pacific formula price of its flagship medium sour Arab Light crude by $1.10/bl from January, pricing the grade at a $2.20/bl premium to the monthly average of Oman-Dubai assessments — the lowest since November. The company cut the February Arab Extra Light price by $1.30/bl, while the Arab Super Light price to Asia-Pacific fell by $1/bl. Prices of Arab Medium and Arab Heavy were reduced by $1/bl and $1.10/bl, respectively, from January, when they were both priced at the highest premiums to the Oman-Dubai benchmarks since at least January 2002.

The Dubai backwardation narrowed in December, after widening to at least a five-year high in November. The premium of front-month February prices to the third-month April contract averaged $1.58/bl in December, down by $1.75/bl from $3.33/bl in November. The change in the Dubai intermonth spread is one factor that producers such as Saudi Arabia consider when setting their monthly official selling prices for buyers in Asia-Pacific.

The emergence of the Omicron variant had sparked concerns about oil demand recovery, while the Opec+ group's decision to stick with its policy of 400,000 b/d monthly production hikes has kept markets well supplied. The co-ordinated strategic petroleum reserve (SPR) release announced by the US, the UK, China, Japan, South Korea and India also stoked oversupply fears, although most of the SPR release will occur gradually over the course of the next few months.

Lower Saudi and other Mideast Gulf official selling prices are likely to impact Asia-Pacific refiners' demand for Russian far-east crudes such as ESPO Blend, as well as demand for Atlantic basin grades, although the latter will find support if the Brent-Dubai EFS narrows further.



Of course, values will also be greatly impacted by the extent of demand in Asia — especially China. There are concerns regarding lockdowns in parts of China and how this might affect crude demand. Chinese refinery crude throughputs fell in December from sky-high levels in November, but were still higher than run rates in July-October. And Indian state-controlled refiners have continued to operate at higher capacities in January in anticipation of stronger fuel demand this year. Japan's refinery runs were also at their highest in December since February 2020.

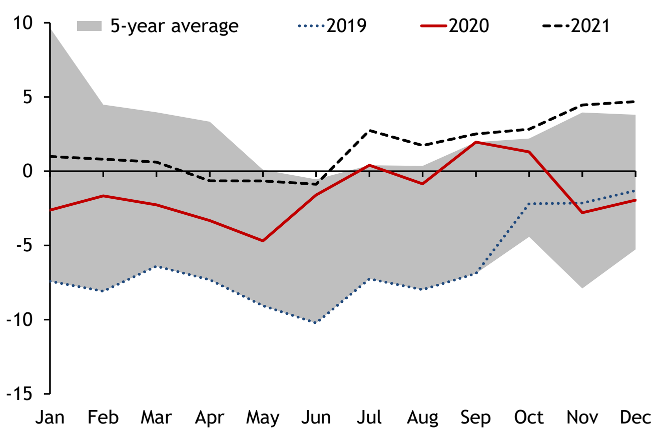
Light distillates

Gasoline and naphtha cracks were on opposing trajectories in December. Gasoline cracks declined in all regions other than the Mediterranean, largely in line with the seasonal norm that sees rising gasoline stocks in the winter months. But naphtha cracks rose in all regions except the US Gulf coast, amid tight supply.

In Europe, December's average gasoline crack slipped by almost $3/bl from November, largely in line with the decline typically observed during the winter months. Naphtha, meanwhile, surged by more than $3/bl from November to an average of more than $4/bl — a six-year high. Much of the strength was driven by firm demand from gasoline blenders. Despite weakening gasoline cracks, demand remained relatively robust as fears that Covid-19's Omicron variant would have a severe impact on European road fuel consumption receded.

Tight supply also lent support to naphtha cracks in Europe. Imports from outlets in the Baltic states were lower than normal because of weather-related loading delays, as were imports from the US. European refiners diverted naphtha production to gasoline blending, limiting the number of cargoes available for the spot market. With naphtha cracks at such strong levels, petrochemicals consumption will switch to LPG, particularly as LPG cracks have fallen to multi-month lows in recent weeks. But the growing petrochemicals demand for LPG could see naphtha cracks softening into January — the European crack had already fallen from a premium to North Sea Dated of close to $6/bl at the end of December to just $2/bl in the first week of January.

Singapore naphtha crack vs Dubai *$/bl*



In the US, December's average gasoline and naphtha cracks were both down compared with November. Gasoline stocks in the US ticked up in December — as you would expect for the time of year. But export demand was particularly weak, averaging just 650,000 b/d, the lowest for almost 18 months. The drop in exports coincided with a decline in the Renewable Volume Obligation (RVO) cost, which averaged $5.50/bl during December, down from $6/bl in November. The falling cost of complying with the federal renewable mandate makes blending fuel for the domestic market more attractive, and this might have restricted volumes available for the export market.

In Asia-Pacific, the Singapore naphtha crack rose slightly on the month during December, while gasoline cracks fell slightly. The naphtha crack received support from maintenance turnarounds at Mideast Gulf condensate splitters — something that could extend into the new year, with Dubai's Enoc having announced a month-long programme of work for its splitter in the first quarter. But any strength could be offset by cracker operators reducing their utilisation rates. South Korean petrochemicals producer LG Chem has cut operating rates at all of its crackers in Yeosu and Daesan as a result of squeezed margins arising from hefty feedstock costs. The producer is running its three crackers at 80pc of capacity for January, down by 10 percentage points from December levels, although February rates are expected to climb back up to 87-88pc.

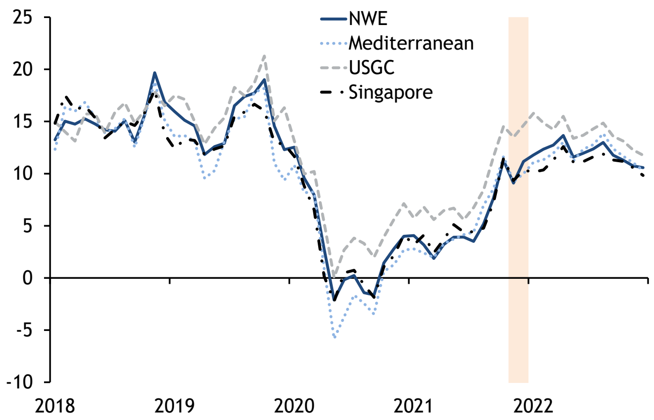
Light distillates crack spreads *$/bl*

	Nov	Dec	Jan	Feb	Mar
Northwest Europe vs Dated					
Naphtha 65 para	0.96	4.27	3.90	3.60	3.40
95R gasoline	12.62	9.65	6.70	7.90	10.10
Mediterranean vs Urals					
Naphtha 65 para	0.69	2.43	3.00	3.30	3.30
95R gasoline	11.60	11.86	9.20	10.30	13.60
US Gulf coast vs LLS					
Naphtha	4.20	3.64	2.20	2.90	4.30
87 conv gasoline	16.51	15.83	14.30	12.80	13.90
Singapore vs Dubai					
Naphtha	4.46	4.69	4.10	5.60	5.00
Naphtha Japan c+f	4.75	4.94	4.70	6.20	5.80
95R gasoline	15.26	14.79	11.70	10.70	12.90

Middle distillates

Middle distillate cracks defied expectations in December by rising across the board, despite the advance of Covid-19's Omicron variant.

Regional jet cracks *$/bl*



Last month, we said we expected jet and diesel cracks to soften, with daily infections in Europe and the US rising to record levels. But several factors meant that stringent lockdowns were largely avoided, and there was not a substantial reduction in demand. Omicron is causing a less severe illness than previous variants of the virus, booster vaccinations are being rolled out in some countries to top up immunity, and there is a general reluctance to reimpose restrictions. So the impact from this latest round of infections has been smaller than that of previous waves.

So the demand picture for middle distillates is still robust. A major European airline told *Argus* that as of the final week of December, there had been no change to its demand for jet fuel delivered by barge. This was corroborated by data from Eurocontrol showing that last month's flight numbers had moved closer to pre-pandemic levels — down by just 7pc on December 2019 in the week ending 23 December, compared with a 23pc lag during November.

The supply side might also have lent support to middle distillates. Diesel and jet cracks crashed in mid-November, largely as a result of a surge in Delta variant cases in Europe. So it is likely that refiners were already looking to cut middle distillate yields when Omicron began to spread. Total refinery runs were also reported to be down in December, and this could extend into January, as natural gas prices have spiked again in Europe and Asia, pushing up refiners' feedstock costs. Moreover, the growing number of workers isolating across the supply chain will probably be impacting deliveries to consumers. This is helping keep stocks of diesel and jet very low — particularly in the US, where jet inventories have fallen to multi-year lows.

Looking ahead, jet and diesel cracks will stay supported as the stock position remains tight *(see graph)*. Europe and the US seem to have shrugged off any demand impact from Omicron. And given how widespread the new variant is, there are growing calls to scrap remaining international air travel restrictions, which would allow jet demand to continue on its recovery path. But risks to the recovery persist, not least in the form of countries with poor access to vaccines. While Europe and the US press on with booster programmes, other parts of the world are lagging behind, and this could result in fresh lockdowns. China has delivered a booster shot to less than 10pc of its population, while India is only due to start its booster programme on 7 January as suspected Omicron infections surge. While there might be some uncertainty around demand, a tight supply picture looks more certain. High gas prices in the near term will continue to force refiners to scale back runs, as will the large number of workers having to isolate.

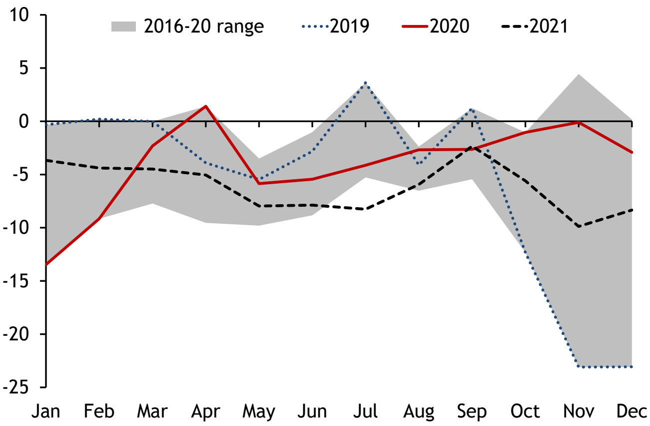
Middle distillates crack spreads *$/bl*

	Nov	Dec	Jan	Feb	Mar
Northwest Europe vs Dated					
Jet-kerosine	9.09	11.17	11.80	12.30	12.70
10ppm diesel	10.85	11.64	12.60	12.70	12.30
1,000ppm heating oil	9.30	10.68	11.60	11.60	10.60
Mediterranean vs Urals					
Jet-kerosine	9.21	10.00	11.20	11.70	12.00
10ppm diesel	11.88	11.96	11.50	12.30	13.20
1,000ppm heating oil	10.57	10.83	12.20	12.60	11.40
US Gulf coast vs LLS					
Jet-kerosine	13.49	14.63	14.70	13.70	13.70
10ppm diesel	18.76	18.79	19.20	20.30	17.70
2,000ppm heating oil	7.27	6.15	7.80	13.50	10.20
Singapore vs Dubai					
Jet-kerosine	9.34	10.34	8.70	11.70	12.40
10ppm diesel	11.74	12.73	11.30	11.80	12.90
500ppm gasoil	11.08	11.81	10.00	10.70	11.90

Fuel oil

High-sulphur fuel oil (HSFO) cracks against regional benchmark crudes rose in all four of the main refining regions during December, reversing the trend seen in the previous two months.

Singapore HSFO 380cst crack spread vs Dubai *$/bl*



The sharpest rise was in northwest Europe, where the 380cst HSFO crack increased by $4.40/bl, just a little less than the drop in November. Refiners remained cautious about production with the news of the omicron variant breaking at the end of November, and although there is no firm data for December yet, refiners may have been reluctant to increase utilisation in the face of the unknown demand impact. Russian fuel oil exports to Europe fell to their lowest since summer 2020, which contributed to tightness in the region. Smaller export-oriented refiners in Russia that buy crude on the spot market were reported to be running at lower rates in December, as domestic crude prices remained relatively high. There was also some demand for fuel oil from the power generation sector in December, with Sweden starting up an oil-fired plant to help ease electricity shortages in nearby Poland.

In Singapore, the HSFO crack against Dubai increased from November levels, but to a lesser extent than in our other regions. Demand has been steadily recovering in Singapore, with bunkering data indicating that HSFO sales in November were at the highest level since the change in International Maritime Organisation regulations in January 2020. Imports into Singapore increased on the month, with tracking data from Vortexa showing this was driven by a doubling of imports from the United Arab Emirates from November, indicating healthy supply to the region. Limited supply of HSFO was reported in the Middle East at the end of last year, and with a severe supply shortage noted early in January at the port of Fujairah. This was linked to lower exports from surrounding countries that were looking to hold on to cargoes for use in power generation.

HSFO cracks are forecast to strengthen again during January as demand remains firm in the power generation sector. Looking further out, HSFO cracks will be supported by demand from the shipping sector from complex refineries, which have made steady purchases of HSFO as a feedstock for their cokers, as they seek to increase distillate production. But markets are still awaiting the outcome of talks between the US and Iran, and although the two sides are far from a deal, if sanctions are lifted, the return of Iranian barrels could weigh on HSFO prices.

In December, 0.5pc sulphur fuel oil cracks also rose, with the northwest Europe crack reaching the highest level in nine months. Export demand provided support for prices as buying interest picked up in Asia. Tight supply of blending components in Singapore and strong demand from the power generation sector provided support for margins in Asia-Pacific, where the crack against Dubai was at its highest in almost two years. Going forward, the 0.5pc sulphur fuel oil market looks well supported as refiners manage utilisation rates in the face of high gas prices and demand uncertainty related to the Omicron variant.

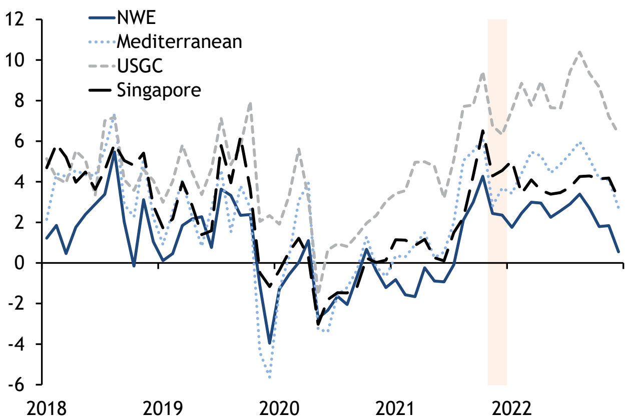
Fuel oil crack spreads *$/bl*

	Nov	Dec	Jan	Feb	Mar
Northwest Europe vs Dated					
LSFO (1% sul)	-2.76	0.56	0.10	-0.20	-0.90
HSFO (3.5% sul)	-13.97	-9.57	-9.20	-9.60	-10.00
Mediterranean vs Urals					
LSFO (1% sul)	0.23	3.26	3.00	2.90	2.00
HSFO (3.5% sul)	-14.07	-10.40	-9.80	-8.40	-8.50
US Gulf coast vs LLS					
LSFO	-1.37	-0.92	-0.40	1.70	-0.10
HSFO (No 6 / 3% sul)	-13.21	-10.48	-10.20	-10.50	-10.60
Singapore vs Dubai					
HSFO 180cst	-8.61	-7.27	-8.20	-5.80	-5.60
HSFO 380cst	-9.88	-8.34	-9.30	-7.00	-6.90

Refining margins

It was a quiet month for refining margins, with gross margins in December remaining within $1/bl of November levels. Margins rose from November in the Mediterranean and in Singapore, but declined in northwest Europe and the US Gulf coast, as weakening gasoline and LPG cracks were largely offset by strengthening fuel oil and middle distillate cracks. Looking ahead, margins could be supported as high feedstock costs and high levels of Omicron infections force refiners to curtail runs *(see graph)*.

Indicator FCC refining margins ***$/bl***



European refiners face a challenging economic environment amid uncertainty around fuel demand prospects. December's gross fluid catalytic cracker (FCC) refining margin fell slightly, by less than 10¢/bl, from November. Covid-19 cases have surged to record highs with the spread of the Omicron variant, and while many countries have avoided strict lockdowns, some countries have imposed limits on private gatherings and bans on spectators at sporting events. But the uncertain outlook is probably spurring refiners to rein in their run rates, especially given today's high feedstock costs. Not only is crude trading at close to $80/bl, but the continuing gas crisis in Europe and Asia-Pacific will continue to push up power and hydrogen costs. So while we do see refining margins in northwest Europe dipping in January, the prospect of run cuts, combined with upcoming spring maintenance, should keep margins supported in the first quarter.

The Mediterranean's indicator refining margin showed the greatest strength in December, rising by $0.90/bl from November. This was underpinned by a strong high-sulphur fuel oil (HSFO) crack, and the Mediterranean was the only one of the four regions where the gasoline crack rose in December.

The situation at refineries in the region varied last month. Crude deliveries to Tarragona in Spain were at just 110,000 b/d in December, which is 63pc of the 2019 average, while deliveries to Fos-Lavera in France averaged 415,000 b/d — 97pc of the 2019 average. Deliveries to Cartagena in Spain were at 270,000 b/d in December, which is some 82pc of 2019 levels.

Strong HSFO cracks also underpinned a rise in the Singapore FCC margin in December. However there could be a weaker outlook for the Asia-Pacific region because of events in China, where the demand picture looks increasingly weak. The government has issued clean air orders for January and February, ahead of the Winter Olympic Games, and this will limit industrial and manufacturing activity in the north of the country, curbing oil consumption. The Games have also prompted a doubling down on Beijing's zero-Covid strategy, with the city of Xi'an, capital of Shaanxi province, ordered into a draconian lockdown on 23 December. On the supply side, the Shandong independent refining sector is to undergo an unprecedented audit that will look into fraudulent tax exemptions. Market participants have said the audit could lead to billions of yuan in fines, and while many of the independents are confident that they will be able to fall back on cash reserves to absorb the penalties, some might have to increase their utilisation rates in order to boost sales and generate cash flow.

Refining margins					$/bl
	Nov	Dec	Jan	Feb	Mar
Northwest Europe					
vs North Sea Dated	2.44	2.36	1.50	2.10	2.90
vs Urals	3.36	3.71	3.60	4.00	5.00
Mediterranean					
vs Urals	2.80	3.70	3.00	4.00	5.40
vs CPC Blend	1.28	2.19	1.70	2.80	3.30
US Gulf coast					
vs LLS	6.76	6.32	6.30	7.40	7.20
vs WTI (Houston)	9.14	9.70	7.90	8.90	8.50
vs Mars	4.59	4.11	4.70	4.60	4.30
Singapore					
vs Dubai	4.28	4.55	2.50	3.70	4.90
vs ESPO Blend	6.74	8.33	6.00	5.80	7.20

Margins calculated based on FCC unit yields

Forecast crude prices															$/bl
	1Q22	2Q22	3Q22	4Q22	2022	1Q23	2Q23	3Q23	4Q23	2023	1Q24	2Q24	3Q24	4Q24	2024
Ice Brent	82.20	77.60	75.60	75.20	**77.70**	72.90	74.30	75.00	72.70	**73.70**	70.30	71.30	71.90	69.80	**70.80**
Nymex WTI	79.20	74.60	72.60	72.20	**74.70**	69.90	71.30	72.00	69.70	**70.70**	67.30	68.30	68.90	66.80	**67.80**
North Sea Dated	81.70	77.00	75.00	74.60	**77.10**	72.30	73.70	74.40	72.10	**73.10**	69.70	70.70	71.30	69.10	**70.20**
Urals NWE	79.90	75.00	73.00	73.00	**75.20**	70.30	71.40	72.20	70.20	**71.00**	67.50	68.20	69.00	67.20	**68.00**
Urals Med	80.30	75.30	73.30	73.30	**75.50**	70.80	71.80	72.60	70.60	**71.50**	68.00	68.60	69.40	67.60	**68.40**
CPC Blend	80.70	75.60	73.50	73.40	**75.80**	70.90	71.70	72.40	70.60	**71.40**	68.80	69.20	69.80	68.20	**69.00**
Bonny Light	82.40	77.80	75.70	75.60	**77.90**	73.80	75.00	75.40	73.30	**74.40**	71.20	72.00	72.60	70.50	**71.60**
Dalia	82.10	77.30	75.70	75.40	**77.60**	73.20	74.10	74.90	72.90	**73.80**	70.10	70.60	71.70	69.60	**70.50**
WTI Midland	79.80	75.10	72.80	72.70	**75.10**	70.30	71.50	71.90	70.00	**70.90**	67.80	68.50	69.10	67.20	**68.10**
WTI Houston	80.30	75.60	73.30	73.20	**75.60**	70.80	72.00	72.40	70.50	**71.40**	68.30	69.00	69.60	67.70	**68.60**
LLS	81.20	75.80	73.60	73.70	**76.10**	71.70	72.90	73.30	71.40	**72.30**	69.40	70.10	70.40	68.60	**69.60**
Mars	78.00	73.60	70.70	70.80	**73.30**	67.90	69.70	70.20	69.00	**69.20**	66.00	66.60	66.70	65.80	**66.20**
WCS Hardisty	65.60	61.40	58.50	58.90	**61.10**	57.90	59.40	59.80	58.80	**59.00**	57.80	58.10	58.00	57.40	**57.80**
WCS Houston	75.00	70.60	67.70	68.10	**70.40**	65.20	66.80	67.10	66.10	**66.30**	63.10	63.50	63.40	62.80	**63.20**
Dubai	80.90	75.50	73.80	73.30	**75.90**	70.60	71.60	72.50	70.50	**71.30**	67.70	68.30	69.10	67.30	**68.10**
Murban	82.00	76.90	75.20	74.50	**77.20**	72.50	73.50	74.20	72.10	**73.10**	69.90	70.40	71.10	69.10	**70.10**
ESPO Blend	82.50	77.90	75.90	75.90	**78.10**	73.60	74.50	75.20	73.30	**74.10**	70.70	71.20	72.00	70.30	**71.00**

Forecast crude differentials															$/bl
	1Q22	2Q22	3Q22	4Q22	2022	1Q23	2Q23	3Q23	4Q23	2023	1Q24	2Q24	3Q24	4Q24	2024
Ice Brent vs N Sea Dated	0.60	0.60	0.60	0.60	**0.60**	0.60	0.60	0.60	0.60	**0.60**	0.60	0.60	0.60	0.60	**0.60**
Urals NWE vs N Sea Dated	-1.80	-2.00	-2.00	-1.70	**-1.90**	-2.00	-2.30	-2.20	-1.90	**-2.10**	-2.20	-2.50	-2.40	-2.00	**-2.20**
Urals Med vs Urals NWE	0.40	0.30	0.30	0.30	**0.30**	0.50	0.40	0.40	0.40	**0.40**	0.50	0.40	0.40	0.40	**0.40**
Urals Med vs N Sea Dated	-1.40	-1.70	-1.70	-1.40	**-1.50**	-1.50	-1.90	-1.80	-1.50	**-1.70**	-1.70	-2.00	-1.90	-1.60	**-1.80**
CPC Blend vs N Sea Dated	-1.00	-1.40	-1.50	-1.20	**-1.30**	-1.40	-2.00	-2.00	-1.50	**-1.70**	-0.90	-1.50	-1.60	-0.90	**-1.20**
Bonny Light vs N Sea Dated	0.70	0.80	0.70	1.00	**0.80**	1.50	1.20	1.10	1.20	**1.30**	1.50	1.30	1.20	1.30	**1.40**
Dalia vs North Sea Dated	0.40	0.30	0.70	0.80	**0.50**	0.90	0.40	0.50	0.80	**0.70**	0.40	-0.10	0.40	0.50	**0.30**
Nymex WTI vs Ice Brent	-3.00	-3.00	-3.00	-3.00	**-3.00**	-3.00	-3.00	-3.00	-3.00	**-3.00**	-3.00	-3.00	-3.00	-3.00	**-3.00**
WTI Midland vs Nymex WTI	0.60	0.50	0.20	0.40	**0.40**	0.40	0.20	-0.10	0.20	**0.20**	0.40	0.20	0.10	0.40	**0.30**
WTI Houston vs Nymex WTI	1.10	1.00	0.70	0.90	**0.90**	0.90	0.70	0.40	0.70	**0.70**	0.90	0.70	0.60	0.90	**0.80**
LLS vs Nymex WTI	2.00	1.20	1.00	1.40	**1.40**	1.90	1.60	1.30	1.70	**1.60**	2.00	1.80	1.50	1.90	**1.80**
LLS vs Mars	3.20	2.20	2.90	2.90	**2.80**	3.80	3.20	3.10	2.40	**3.10**	3.40	3.50	3.80	2.90	**3.40**
Mars vs Nymex WTI	-1.20	-1.00	-1.90	-1.40	**-1.40**	-2.00	-1.60	-1.80	-0.70	**-1.50**	-1.40	-1.70	-2.30	-1.00	**-1.60**
WCS Hardisty vs Nymex WTI	-13.60	-13.20	-14.10	-13.30	**-13.60**	-12.00	-11.90	-12.20	-10.90	**-11.70**	-9.50	-10.20	-10.90	-9.40	**-10.00**
WCS Houston vs Nymex WTI	-4.20	-4.00	-4.90	-4.10	**-4.30**	-4.70	-4.50	-4.90	-3.60	**-4.40**	-4.20	-4.80	-5.50	-4.00	**-4.60**
Dubai vs Ice Brent	-1.30	-2.10	-1.80	-2.00	**-1.80**	-2.30	-2.70	-2.50	-2.20	**-2.40**	-2.60	-3.00	-2.80	-2.40	**-2.70**
Murban vs Ice Brent	-0.20	-0.70	-0.40	-0.70	**-0.50**	-0.40	-0.80	-0.80	-0.60	**-0.60**	-0.40	-0.90	-0.80	-0.70	**-0.70**
ESPO Blend vs Dubai	1.60	2.50	2.10	2.60	**2.20**	3.00	2.90	2.70	2.80	**2.80**	3.00	2.90	2.80	2.90	**2.90**

Product prices															$/bl
	1Q22	2Q22	3Q22	4Q22	2022	1Q23	2Q23	3Q23	4Q23	2023	1Q24	2Q24	3Q24	4Q24	2024
Northwest Europe															
Naphtha 65 para	85.30	79.10	75.80	74.50	**78.70**	71.60	72.60	73.30	71.10	**72.20**	68.30	68.70	69.50	67.70	**68.60**
95R gasoline	89.90	87.50	86.00	80.90	**86.10**	79.50	86.30	86.80	79.20	**82.90**	78.10	84.70	85.10	77.00	**81.20**
Jet-kerosine	94.00	89.40	87.40	85.50	**89.10**	82.80	83.20	84.90	83.20	**83.50**	81.20	81.10	82.80	81.20	**81.60**
10ppm diesel	94.20	88.50	86.60	86.80	**89.00**	83.60	84.80	86.30	84.30	**84.70**	80.70	81.40	82.90	81.00	**81.50**
1,000ppm heating oil	92.90	87.40	85.40	85.60	**87.80**	82.90	83.80	85.10	83.20	**83.80**	80.20	80.70	81.90	80.10	**80.70**
LSFO (1% sul)	81.30	75.60	74.20	74.10	**76.30**	69.60	71.10	72.80	70.70	**71.10**	66.20	67.60	69.70	67.30	**67.70**
HSFO (3.5% sul)	72.10	66.20	64.90	64.20	**66.80**	58.70	60.40	62.50	60.20	**60.50**	55.10	56.70	58.90	56.70	**56.80**
Mediterranean															
Naphtha 65 para	83.50	77.50	74.50	72.80	**77.10**	69.80	71.00	71.90	69.40	**70.50**	66.40	67.10	68.10	65.90	**66.90**
95R gasoline	91.30	88.40	86.90	81.50	**87.00**	80.80	87.20	87.70	79.80	**83.90**	79.30	85.40	85.90	77.50	**82.00**
Jet-kerosine	91.90	87.50	86.30	84.30	**87.50**	81.50	82.00	83.90	81.90	**82.30**	79.90	79.80	81.70	79.90	**80.30**
10ppm diesel	92.60	88.30	87.10	86.90	**88.70**	84.10	85.30	86.80	84.30	**85.10**	81.20	81.90	83.40	81.00	**81.90**
1,000ppm heating oil	92.30	87.10	85.00	85.30	**87.40**	82.70	83.60	84.80	82.90	**83.50**	80.00	80.40	81.60	79.80	**80.40**
LSFO (1% sul)	82.90	76.70	75.10	75.30	**77.50**	71.20	72.20	73.70	72.00	**72.30**	67.70	68.60	70.50	68.50	**68.90**
HSFO (3.5% sul)	71.30	66.00	64.70	64.00	**66.50**	59.00	60.70	63.00	60.60	**60.80**	55.70	57.30	59.70	57.40	**57.50**
US Gulf coast															
Naphtha	84.30	79.10	75.80	74.90	**78.50**	73.60	74.60	75.10	71.90	**73.80**	70.30	70.80	71.30	68.50	**70.20**
87 conv gasoline	94.90	90.20	90.80	84.60	**90.10**	83.50	88.80	90.60	83.10	**86.50**	82.30	87.60	90.40	81.10	**85.40**
Jet-kerosine	95.20	89.50	87.30	85.50	**89.40**	81.70	82.00	85.70	82.10	**82.90**	80.10	79.90	83.60	80.20	**80.90**
10ppm diesel	100.30	93.40	93.00	91.90	**94.70**	89.90	88.90	91.90	88.50	**89.80**	87.00	85.50	88.50	85.20	**86.50**
2,000ppm heating oil	91.70	86.90	86.50	86.00	**87.80**	83.50	82.30	85.40	82.60	**83.50**	80.60	79.00	82.00	79.30	**80.20**
LSFO	81.60	75.30	75.00	74.50	**76.60**	70.70	70.80	73.70	71.10	**71.60**	67.40	67.20	70.60	67.70	**68.20**
HSFO (No 6 / 3% sul)	70.80	64.50	63.00	63.20	**65.40**	58.70	59.70	61.00	59.90	**59.80**	57.80	58.00	59.30	58.40	**58.40**
Singapore															
Naphtha	85.80	80.10	76.40	75.40	**79.40**	72.90	73.70	73.40	72.10	**73.00**	69.50	69.80	69.60	68.70	**69.40**
Naphtha Japan c+f	86.40	81.10	77.80	76.60	**80.50**	73.70	74.70	74.80	73.00	**74.00**	70.30	70.80	71.00	69.90	**70.50**
95R gasoline	92.60	87.30	85.50	82.70	**87.00**	81.40	85.60	86.30	80.90	**83.50**	80.20	84.50	84.60	78.60	**82.00**
Jet-kerosine	91.80	88.10	85.40	83.80	**87.30**	82.20	82.50	83.60	82.10	**82.60**	80.70	80.50	81.70	80.30	**80.80**
10ppm diesel	92.90	87.90	85.70	85.80	**88.10**	83.70	84.70	86.00	83.80	**84.60**	81.00	81.50	82.70	80.70	**81.50**
500ppm gasoil	91.70	86.70	84.30	84.70	**86.80**	82.60	83.50	84.50	82.70	**83.30**	79.90	80.30	81.30	79.50	**80.20**
HSFO 180cst	74.40	70.20	68.00	68.10	**70.20**	62.60	64.40	65.60	64.10	**64.20**	58.90	60.60	61.80	60.40	**60.50**
HSFO 380cst	73.20	68.60	66.90	67.10	**69.00**	61.50	62.90	64.50	63.20	**63.00**	57.90	59.20	60.90	59.60	**59.40**

Product crack spreads															*$/bl*
	1Q22	**2Q22**	**3Q22**	**4Q22**	**2022**	**1Q23**	**2Q23**	**3Q23**	**4Q23**	**2023**	**1Q24**	**2Q24**	**3Q24**	**4Q24**	**2024**
Northwest Europe vs North Sea Dated															
Naphtha 65 para	3.60	2.10	0.80	-0.10	**1.60**	-0.60	-1.10	-1.10	-1.00	**-1.00**	-1.40	-2.00	-1.80	-1.50	**-1.70**
95R gasoline	8.20	10.50	11.00	6.30	**9.00**	7.20	12.60	12.40	7.10	**9.80**	8.40	14.00	13.80	7.80	**11.00**
Jet-kerosine	12.30	12.40	12.40	10.90	**12.00**	10.50	9.50	10.50	11.10	**10.40**	11.50	10.40	11.50	12.00	**11.30**
10ppm diesel	12.50	11.50	11.60	12.20	**12.00**	11.30	11.00	11.90	12.20	**11.60**	10.90	10.70	11.50	11.80	**11.30**
1,000ppm heating oil	11.30	10.40	10.40	11.00	**10.80**	10.60	10.10	10.70	11.10	**10.60**	10.50	10.00	10.60	10.90	**10.50**
LSFO (1% sul)	-0.30	-1.40	-0.80	-0.50	**-0.80**	-2.70	-2.60	-1.60	-1.40	**-2.10**	-3.50	-3.10	-1.70	-1.80	**-2.50**
HSFO (3.5% sul)	-9.60	-10.80	-10.10	-10.40	**-10.20**	-13.60	-13.30	-11.90	-11.90	**-12.70**	-14.70	-14.00	-12.40	-12.50	**-13.40**
Mediterranean vs Urals															
Naphtha 65 para	3.20	2.20	1.10	-0.40	**1.50**	-1.00	-0.80	-0.70	-1.20	**-0.90**	-1.60	-1.60	-1.30	-1.60	**-1.50**
95R gasoline	11.00	13.10	13.60	8.20	**11.50**	10.00	15.40	15.10	9.20	**12.40**	11.20	16.80	16.40	10.00	**13.60**
Jet-kerosine	11.60	12.20	13.00	11.00	**12.00**	10.70	10.20	11.30	11.30	**10.90**	11.90	11.20	12.30	12.40	**11.90**
10ppm diesel	12.30	13.10	13.80	13.60	**13.20**	13.30	13.40	14.20	13.70	**13.70**	13.20	13.30	14.00	13.40	**13.50**
1,000ppm heating oil	12.10	11.80	11.70	12.10	**11.90**	11.90	11.70	12.20	12.30	**12.00**	11.90	11.80	12.20	12.20	**12.00**
LSFO (1% sul)	2.60	1.40	1.70	2.10	**2.00**	0.40	0.40	1.10	1.40	**0.80**	-0.30	0.00	1.10	1.00	**0.40**
HSFO (3.5% sul)	-8.90	-9.30	-8.60	-9.30	**-9.00**	-11.80	-11.10	-9.60	-10.00	**-10.60**	-12.30	-11.40	-9.70	-10.20	**-10.90**
US Gulf coast vs LLS															
Naphtha	3.10	3.30	2.20	1.20	**2.50**	1.90	1.70	1.80	0.50	**1.50**	0.90	0.70	0.90	-0.10	**0.60**
87 conv gasoline	13.70	14.40	17.20	10.90	**14.10**	11.80	15.90	17.30	11.70	**14.20**	12.90	17.60	20.00	12.50	**15.70**
Jet-kerosine	14.00	13.70	13.70	11.90	**13.30**	9.90	9.10	12.40	10.70	**10.50**	10.70	9.80	13.10	11.50	**11.30**
10ppm diesel	19.10	17.60	19.40	18.30	**18.60**	18.20	15.90	18.60	17.10	**17.50**	17.60	15.40	18.10	16.50	**16.90**
2,000ppm heating oil	10.50	11.10	12.90	12.40	**11.70**	11.80	9.40	12.10	11.20	**11.10**	11.30	8.90	11.60	10.70	**10.60**
LSFO	0.40	-0.50	1.40	0.80	**0.50**	-1.10	-2.10	0.40	-0.30	**-0.80**	-2.00	-2.80	0.20	-0.90	**-1.40**
HSFO (No 6 / 3% sul)	-10.40	-11.30	-10.60	-10.50	**-10.70**	-13.00	-13.20	-12.30	-11.50	**-12.50**	-11.60	-12.00	-11.10	-10.30	**-11.20**
Singapore vs Dubai															
Naphtha	4.90	4.70	2.60	2.10	**3.60**	2.30	2.10	0.90	1.50	**1.70**	1.80	1.50	0.50	1.40	**1.30**
Naphtha Japan c+f	5.60	5.60	4.00	3.30	**4.60**	3.10	3.00	2.30	2.40	**2.70**	2.70	2.50	1.90	2.60	**2.40**
95R gasoline	11.80	11.80	11.70	9.40	**11.20**	10.80	14.00	13.80	10.40	**12.20**	12.50	16.10	15.50	11.30	**13.90**
Jet-kerosine	10.90	12.60	11.60	10.50	**11.40**	11.60	10.90	11.10	11.60	**11.30**	13.00	12.10	12.60	13.00	**12.70**
10ppm diesel	12.00	12.40	11.90	12.50	**12.20**	13.10	13.10	13.50	13.30	**13.30**	13.30	13.20	13.60	13.40	**13.40**
500ppm gasoil	10.90	11.20	10.50	11.40	**11.00**	12.00	11.80	12.00	12.10	**12.00**	12.20	12.00	12.10	12.20	**12.10**
HSFO 180cst	-6.50	-5.20	-5.80	-5.20	**-5.70**	-8.00	-7.20	-6.90	-6.50	**-7.10**	-8.80	-7.70	-7.30	-6.90	**-7.70**
HSFO 380cst	-7.70	-6.80	-6.90	-6.20	**-6.90**	-9.10	-8.80	-7.90	-7.40	**-8.30**	-9.80	-9.20	-8.30	-7.80	**-8.80**

Refining margins															$/bl
	1Q22	2Q22	3Q22	4Q22	2022	1Q23	2Q23	3Q23	4Q23	2023	1Q24	2Q24	3Q24	4Q24	2024
Northwest Europe															
vs North Sea Dated	2.20	2.60	3.00	1.40	**2.30**	0.80	2.00	2.70	1.50	**1.70**	1.20	2.30	3.00	1.50	**2.00**
vs Urals	4.20	4.50	5.00	3.30	**4.20**	2.50	3.90	4.70	3.30	**3.60**	2.90	4.20	5.00	3.40	**3.90**
Mediterranean															
vs Urals	4.10	4.90	5.50	3.70	**4.50**	3.20	4.50	5.30	3.80	**4.20**	3.60	4.80	5.60	3.90	**4.50**
vs CPC Blend	2.60	3.30	3.80	2.10	**2.90**	2.10	3.10	3.90	2.50	**2.90**	2.00	2.90	3.60	2.00	**2.60**
US Gulf coast															
vs LLS	7.00	7.60	9.20	6.90	**7.70**	5.90	6.20	8.40	6.40	**6.70**	5.90	6.20	8.70	6.10	**6.70**
vs WTI (Houston)	8.40	8.20	9.80	7.60	**8.50**	7.40	7.70	9.70	7.70	**8.10**	7.50	7.80	10.10	7.40	**8.20**
vs Mars	4.50	3.50	5.40	3.90	**4.30**	3.40	2.90	4.50	2.80	**3.40**	3.40	3.50	5.60	3.30	**3.90**
Singapore															
vs Dubai	3.70	4.50	4.10	3.80	**4.00**	3.40	3.90	4.30	3.90	**3.90**	3.70	4.20	4.40	3.90	**4.10**
vs ESPO Blend	6.30	6.00	6.00	5.20	**5.90**	4.80	5.30	5.90	5.30	**5.30**	5.10	5.60	6.00	5.20	**5.40**

Margins calculated based on FCC unit yields

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

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Publisher
Adrian Binks

Chief operating officer
Matthew Burkley

Global compliance officer
Jeffrey Amos

Chief commercial officer
Jo Loudiadis

President, Oil
Euan Craik

SVP Consulting services
Lloyd Thomas

Head of forecasting
Francis Osborne

Senior Analyst
Martha Tallas
Tel: +44 20 7780 4200
martha.tallas@argusmedia.com

Customer support and sales:
support@argusmedia.com
sales@argusmedia.com

London, Tel: +44 20 7780 4200
Beijing, Tel: +86 10 6598 2000
Dubai, Tel: +971 4434 5112
Hamburg, Tel: +49 48 22 378 22-0
Houston, Tel: +1 713 968 0000
Kyiv, Tel: +38 (044) 298 18 08
Moscow, Tel: +7 495 933 7571
Mumbai, Tel: +91 22 4174 9900
New York, Tel: +1 646 376 6130
Paris, Tel: +33 1 53 05 57 58
San Francisco, Tel: +1 415 829 4591
Sao Paulo, Tel: +55 11 3235 2700
Shanghai, Tel: +86 21 6377 0159
Singapore, Tel: +65 6496 9966
Tokyo, Tel: +81 3 3561 1805
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