

Oil Market Report

18 January 2024

- Global oil demand growth slowed to 1.7 mb/d y-o-y in 4Q23 – well below the 3.2 mb/d rate registered during 2Q23-3Q23, mirroring the unwinding of China’s post-pandemic release of travel demand. Growth is projected to ease from 2.3 mb/d in 2023 to 1.2 mb/d in 2024, as macroeconomic headwinds, tighter efficiency standards and an expanding EV fleet compound the baseline effect.
- World oil supply is forecast to rise by 1.5 mb/d to a new high of 103.5 mb/d, fuelled by record-setting output from the US, Brazil, Guyana and Canada. Non-OPEC+ production will dominate growth this year, accounting for close to 1.5 mb/d. By contrast, OPEC+ supply is expected to hold broadly steady on last year, assuming extra voluntary cuts that started this month are phased out gradually in 2Q24.
- Divergence in regional refinery profitability narrowed further in December as margins in the Atlantic Basin weakened but strengthened in Singapore. Refinery crude throughputs are forecast to average 83.3 mb/d in 2024, overtaking 2018’s record of 82.5 mb/d. However, the disparity between OECD and non-OECD runs will continue to widen, as new capacity starts in the Middle East, Africa, and China.
- Russian oil exports rose by 500 kb/d to a nine-month high of 7.8 mb/d in December. Crude shipments were up by 240 kb/d m-o-m to 5 mb/d while product flows rose by 260 kb/d. At the same time, estimated export revenues slumped to a six-month low of \$14.4 billion, as Russian oil price discounts increased and benchmark oil prices declined.
- Global observed oil inventories were down by 8.4 mb in November, to their lowest since July 2022, with crude oil and middle distillates particularly tight. A decline in oil on water (-12 mb) was partially offset by on-land stock builds (+3.6 mb). Oil products decreased by a substantial 24.6 mb, while crude oil rose by 16.2 mb. Preliminary data suggest that global inventories rose in December, as oil on water surged.
- Benchmark crude oil futures recovered by around \$4/bbl from their mid-December lows as tensions in the Red Sea reignited geopolitical concerns. Prices declined last month amid comfortable physical balances, with record US oil supply making its way into the Atlantic Basin. Fund exchange positioning slumped to its most bearish level in years. At the time of writing, Brent futures were trading at \$77/bbl.



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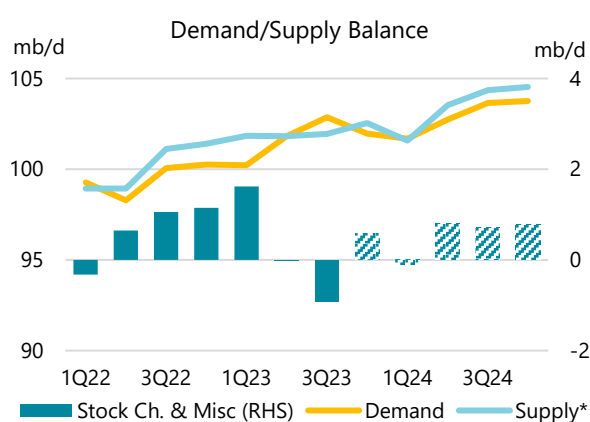
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Choppy waters

Rising geopolitical tensions in the Middle East, which accounts for one-third of the world's seaborne oil trade, has markets on edge at the start of 2024. US and UK airstrikes on Houthi targets in Yemen in response to attacks on tankers in the Red Sea by the Iran-backed group, have raised concerns that an escalation of the conflict could further disrupt the flow of oil via key trade chokepoints. While oil and LNG production have not been impacted, a rising number of ship owners are diverting cargoes away from the Red Sea. At the time of writing, Brent futures were just above \$77/bbl and WTI around \$72/bbl.

Barring significant disruptions to oil flows, the market looks reasonably well supplied in 2024, with higher-than-expected non-OPEC+ production increases set to outpace oil demand growth by a healthy margin. While OPEC+ supply management policies may tip the oil market into a small deficit at the start of the year, strong growth from non-OPEC+ producers could lead to a substantial surplus if the OPEC+ group's extra voluntary cuts are unwound in 2Q24.

Global oil supply is forecast to rise by 1.5 mb/d to a new high of 103.5 mb/d in 2024. The Americas – led by the United States, Brazil, Guyana and Canada – will dominate gains in 2024, just as the region did last year. After a steep rise in output in 4Q23, global oil supply is expected to decline this month as a blast of cold weather sweeping through the United States and Canada takes a toll on oil operations.



* Assumes OPEC+ targets and voluntary cuts in place through 2024.

Increases in global oil demand are set to halve from 2.3 mb/d in 2023 to 1.2 mb/d this year, with the post-Covid recovery all but complete, GDP growth below trend in major economies, and as energy efficiency improvements and electrification of the vehicle fleet curb oil use. Over the course of 2023, the pace of demand growth outside of China slowed significantly, to around 300 kb/d on average during 2H23. China will continue to lead oil demand growth in 2024, with its expanding petrochemical sector gaining an ever-larger share.

At the start of 2024, the risk of global oil supply disruptions from the Middle East conflict remains elevated, particularly for oil flows via the Red Sea and, crucially, the Suez Canal. In 2023, roughly 10% of the world's seaborne oil trade, or around 7.2 mb/d of crude and oil products, and 8% of global LNG trade passed through this major trade route. The main alternative shipping route around Africa's Cape of Good Hope extends voyages by up to two weeks – adding pressure on global supply chains and boosting freight and insurance costs.

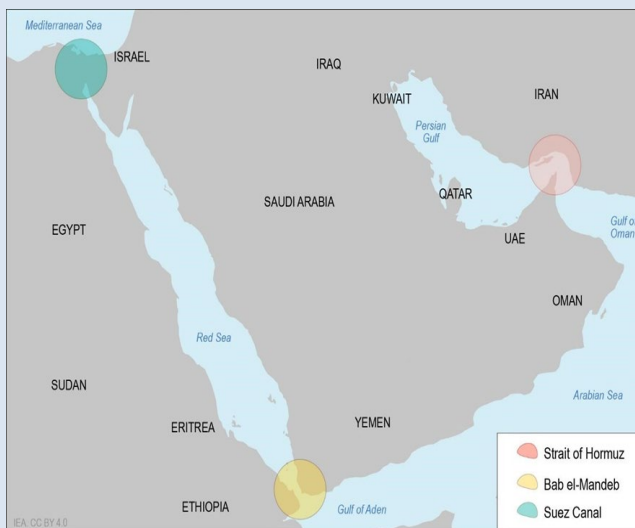
As always, the IEA stands ready to respond decisively if there is a supply disruption and the global oil market requires additional barrels. IEA member countries collectively hold stocks of around 4 billion barrels, including 1.2 billion barrels of government-controlled stocks held exclusively in case of an emergency. That buffer should help assuage market jitters and angst among governments, industries and energy consumers.

Red Sea tanker attacks raise supply risks via oil choke points

Attacks by Iran-backed Houthis on ships transiting the Red Sea are disrupting energy flows through this major commodity trade route. Many shippers were already actively avoiding the Red Sea and an increasing number of cargoes are being diverted to the alternative route via the Cape of Good Hope. In 2023, around 7.2 mb/d of oil, or about 10% of total seaborne oil trade, passed through this waterway and the Suez Canal. Similarly, about 8% of global LNG trade transited the Red Sea.

Some container ships and oil tankers had been skirting the Red Sea before recent US/UK retaliatory strikes on Houthi targets in Yemen in response to repeated tanker attacks since November. Now oil flows through the Suez Canal could decline to minimal levels. Shipping companies such as Stena Bulk, Hafnia, Torm and Euronav have declared a halt to transit via the Red Sea. Among oil companies, Shell, BP and Equinor have reportedly suspended shipments through the area. LNG tankers are also being diverted.

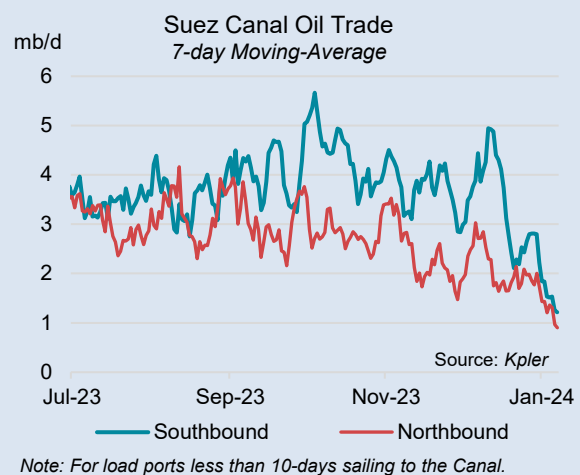
Key Middle East Trade Routes



For ships transiting the Suez Canal via the Red Sea, the main alternative is to re-route ships around Africa's Cape of Good Hope. This adds up to two weeks to the voyage time, which in addition to delayed deliveries, raises the risks for supply chain bottlenecks, higher freight costs and renewed inflationary pressures. The resulting build of oil in transit heightens tensions in already tight crude and product markets, notably for Middle East crude to the Atlantic Basin, for Russian crude to Asia and for middle distillates from the Middle East and India to Europe.

A prolonged rerouting of commodity flows could affect European oil product prices. Export prices reflect those in Asia less the cost of shipping which would rise with the extended voyage time, while import prices constitute those in Asia plus shipping costs. Hence, naphtha and fuel oil export prices would be depressed while diesel and jet fuel import costs would rise. The Mediterranean markets could be heavily affected by the increase in shipping delays as Middle East crude swings from the Red Sea to the long-haul Cape route.

Suez Canal flows for ships loading in ports less than 10 days voyage time to its entrance have declined sharply, according to *Kpler* tanker tracking data. Volumes rerouting via the Cape have increased markedly since the Israel-Hamas conflict began on 7 October. On the current trend, oil trade flows via the Suez Canal could be almost two thirds lower by end-January.



Even so, substantial volumes of oil continue to flow both into and out of the Red Sea, both through the Canal and the Bab El-Mandeb strait between Yemen and Ethiopia.

In 2023, 2.4 mb/d of crude oil, or 6% of global seaborne crude trade, flowed east via the Suez Canal. While the majority of crude was shipped from Russia, boosted by G7/EU embargo, a small portion was shipped from North Africa, the North Sea and the United States. The barrels were flowing primarily towards India and China. Over the same period, some 1.7 mb/d of oil products, or 6% of global product trade, flowed east through the canal. The majority originated from Russia and was destined for the Middle East and Asia.

Total Eastward Oil Flows in 2023



Source: *Kpler* data through November 2023.

Roughly 1.1 mb/d of crude oil flowed westward, representing 3% of global seaborne crude trade. The vast majority came from the Middle East destined for Europe, with smaller volumes flowing to the Americas. Around 1.8 mb/d of oil products moved via the Suez Canal to the Mediterranean, mostly from the Middle East. While exports were mainly destined for Europe and the Americas, a small amount went to Africa. These flows increased following the Russian invasion of Ukraine.

Total Westward Oil Flows in 2023

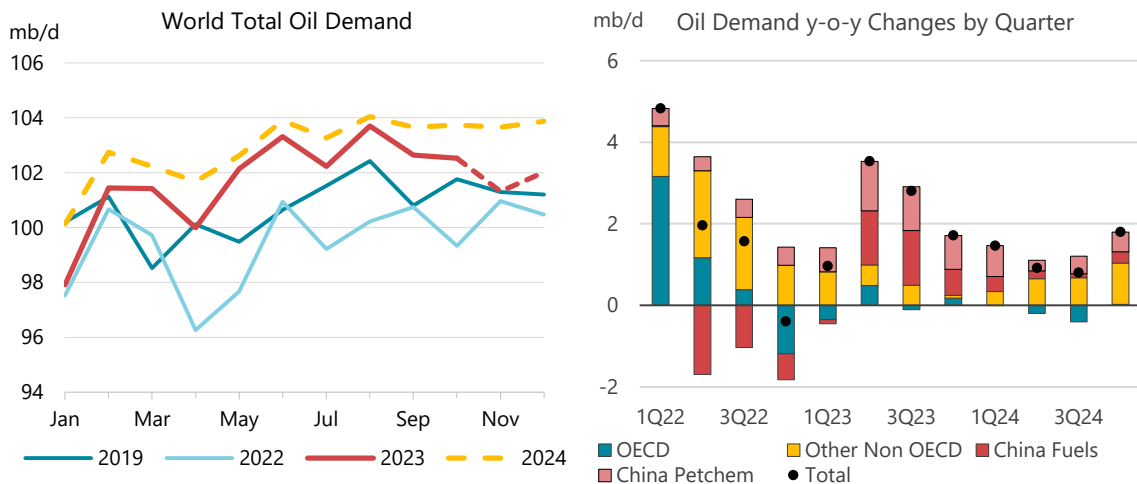


Source: *Kpler* data through November 2023.

Demand

Overview

Global oil demand is forecast to increase by 1.2 mb/d y-o-y in 2024 – a pronounced slowdown from last year’s 2.3 mb/d growth. This marks a return to pre-pandemic growth trend, as a recalibration of baselines after the Covid years combines with cooling global economic activity. Recent delivery data have corroborated this loss of momentum, with annual growth declining from 2.8 mb/d in 3Q23 to 1.7 mb/d in 4Q23, marking a deceleration we expect to continue well into 2024.



Moreover, the overall demand picture remains strongly Sinocentric, with China accounting for almost 60% of this year’s global growth. This share was more than three-quarters last year as China emerged from lockdowns. Petrochemical feedstocks, including LPG/ethane and naphtha, are on track to consolidate their status as the mainstays of rising global consumption, almost doubling their share of the product growth mix to 60%. The gains come predominantly at the expense of gasoline and jet/kerosene, as 2023’s post-pandemic release of pent-up Asian travel demand recedes, efficiency standards continue to tighten and electric vehicle sales rise.

Global Demand by Region								
(thousand barrels per day)								
	Demand				Annual Chg (kb/d)		Annual Chg (%)	
	2021	2022	2023	2024	2023	2024	2023	2024
Africa	4 052	4 283	4 247	4 358	- 36	111	-0.8	2.6
Americas	30 287	31 000	31 329	31 377	329	47	1.1	0.2
Asia/Pacific	35 953	36 096	38 123	39 186	2 027	1 063	5.6	2.8
Europe	13 965	14 296	14 192	14 103	- 103	- 89	-0.7	-0.6
FSU	4 891	4 945	4 928	4 901	- 17	- 27	-0.3	-0.6
Middle East	8 350	8 848	8 902	9 034	54	133	0.6	1.5
World	97 497	99 468	101 722	102 959	2 254	1 237	2.3	1.2
OECD	44 813	45 680	45 731	45 583	51	- 148	0.1	-0.3
Non-OECD	52 684	53 788	55 991	57 376	2 203	1 385	4.1	2.5

These trends are expected to sharpen the dichotomy between a listless OECD and the resilient non-OECD that was in evidence throughout 2023, when the latter accounted for 98% of global demand gains. In 2024, OECD deliveries are on course to enter a narrow annual decline, contracting by 150 kb/d y-o-y.

The global economic climate remains distinctly challenging. Business activity and consumer spending remain subdued in the aftermath of unprecedented interest rate hikes in 2022-23, exacerbated by a curtailment in the availability of bank credit. The United States has weathered these monetary headwinds considerably better than expected. By contrast, developed economies in Europe and Asia are on track for a third straight year of subpar performance and recession risks remain acute. Among emerging countries, China's GDP is set to grow by a relatively mediocre 4-5% in 2024, as a persistent property slump, tepid domestic demand and a general loss of confidence risk tipping the economy into a deflationary spiral. India is on course to be the world's fastest growing major economy for a third straight year, while Gulf countries are also on track for a pickup in growth.

Even so, the consensus economic outlook has improved somewhat over the last few months in the wake of the recent dovish pivot in central bank policy. The 4Q23 slump in oil prices acts as an additional tailwind. Against this backdrop, we have raised our 2024 demand growth forecast by 180 kb/d compared with last month's *Report*, and by 360 kb/d in total in 4Q23.

Global Demand by Product								
(thousand barrels per day)								
	Demand				Annual Chg (kb/d)		Annual Chg (%)	
	2021	2022	2023	2024	2023	2024	2023	2024
LPG & Ethane	13 795	14 129	14 558	14 854	429	297	3.0	2.0
Naphtha	7 018	6 801	7 160	7 600	359	440	5.3	6.1
Motor Gasoline	25 680	26 218	26 943	27 098	725	155	2.8	0.6
Jet Fuel & Kerosene	5 171	6 130	7 203	7 349	1 073	146	17.5	2.0
Gas/Diesel Oil	27 347	28 136	28 263	28 479	127	215	0.5	0.8
Residual Fuel Oil	6 264	6 525	6 427	6 501	- 98	74	-1.5	1.2
Other Products	12 221	11 529	11 168	11 078	- 361	- 90	-3.1	-0.8
Total Products	97 497	99 468	101 722	102 959	2 254	1 237	2.3	1.2

Evolution of 2023 forecast fuel demand growth

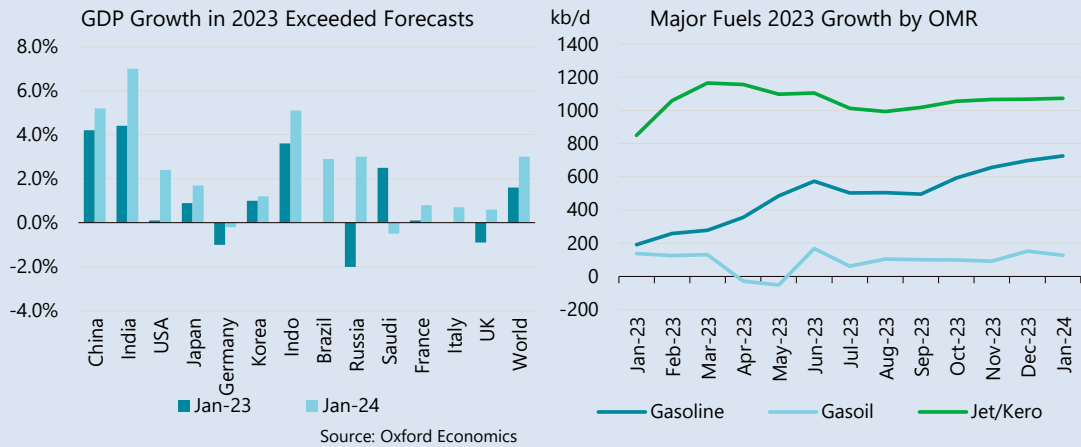
Our expectations for global oil demand growth gathered pace during 2023. Overall annual gains were projected at 1.9 mb/d in the January 2023 *Report* and in this edition, we now estimate an increase of 2.3 mb/d. Gasoline proved the strongest performer, outpacing our earlier expectations that growth would structurally slow in 2023.

While falling crude prices and product cracks clearly played a role, the higher demand growth was primarily driven by the stronger-than-expected economic growth and the abrupt post-lockdown rebound in China during 1H23. In their late-2022 forecast for global 2023 GDP growth, OECD economists estimated an expansion of 2.2%. In their most recent update, published in November, world GDP growth for last year was assessed at 2.9%. For the IMF, the upgrade was more modest, from 2.7% to 3% while for Oxford Economics the revision was from 1.8% to 3%. While forecasters differed on specific countries, the key areas of overperformance were the United States (where Oxford Economics went from 0.1% in January 2023 to 2.4% this month), China (4.2% to 5.2%) and India (4.4% to 7%).

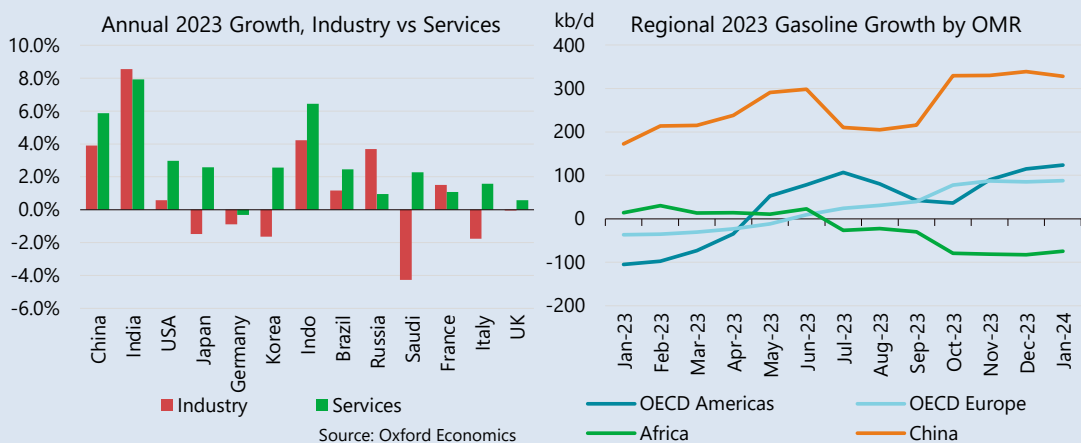
The contrasting fortunes of the three major transport fuel product categories – gasoil, gasoline and jet/kerosene – illustrate some of the key trends in the performance of the global economy last year and important considerations for forecasting demand growth for 2024.

As part of its long rebound from Covid-19 disruptions, jet/kerosene was the fastest growing product in 2023. This growth was more frontloaded than expected, with the speed of the reopening of Chinese skies particularly striking. Nevertheless, it appears that this recovery period of exceptional increases is now essentially complete and that gains will be more incremental from now on. These will be

substantially offset by efficiency gains and structurally lower heating and cooking use of kerosene. Global aviation activity has tracked close to 2019 levels since April but 2H23 jet/kerosene demand remained more than 500 kb/d lower than 2H19. The combination of a return to steadier growth in aviation activity and substantial uptake of new, more efficient aircraft means that we anticipate a sharp slowdown in jet/kerosene growth from 1.1 mb/d last year to only 150 kb/d in 2024.



Gasoline demand growth also benefitted from China’s mobility-led reopening. However, it overperformed across a number of regions, moving into progressively higher gear during the year. Primarily this appears to reflect the composition of economic growth. At the start of last year, pessimistic macroeconomic outlooks were founded on meagre prospects for global manufacturing. For that part of the economy, they were largely correct. By contrast, service activity surprised strongly to the upside to boost overall performance. Indeed, in the United States, China, Japan, Korea, the eurozone and the United Kingdom there was a substantial difference between the performance of the sectors. Personal mobility and gasoline demand are more connected to services activity, while gasoil follows industrial performance. This uneven economic growth helped gasoline exceed our forecasts. On the other hand, gasoil, stifled by consistently sluggish global manufacturing, saw little change to forecast growth all year.



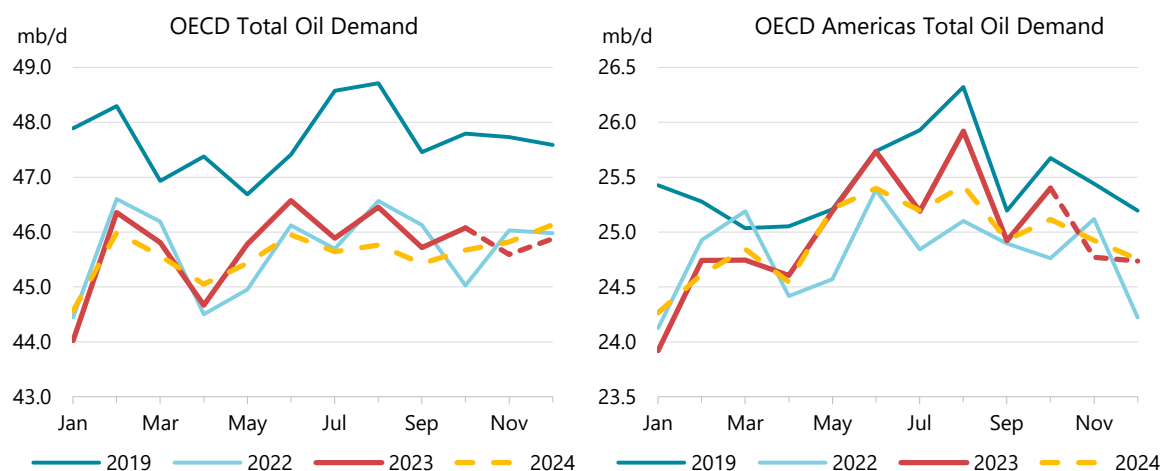
The United States, followed by China, saw the largest absolute overperformance in gasoline demand, relative to our forecast. GDP growth in the world’s largest oil consumer was much higher than the forecasts used in our projections and was particularly dependent on services activity. With employment data also staying strong in the face of Federal Reserve interest rate hikes, Americans drove 2.2% further in total y-o-y during the first 11 months of 2023. Federal Highways Administration (FHWA) miles driven

data suggests that efficiency gains may have been slightly lower than assumed in our January 2023 forecasts, but this would only be enough to explain part of the subsequent increase.

For 2024, we expect gasoil demand growth to show a slight uptick, but we see a major slowdown in gasoline growth compared with 2023, from 720 kb/d to 150 kb/d. In part, this assumes more balanced GDP growth. In early 2023, service sector purchasing managers' indices (PMIs) were generally significantly ahead of their manufacturing counterparts. These sentiments proved well founded but now the gaps are smaller, suggesting that increases could be more evenly distributed. However, if services and mobility are able to run ahead of the rest of the economy once again, this could lead to a further shift in the balance between gasoline and gasoil demand.

OECD

Total OECD oil deliveries increased by a modest 50 kb/d (+0.1%) during 2023. With the post-Covid rebound now virtually complete, this stagnation is likely to persist this year, with a small contraction of 150 kb/d taking demand to an average of 45.6 mb/d. The Americas was the only OECD region to show overall growth last year, reflecting comparatively benign macroeconomic conditions in the United States and petrochemical industry dynamics. As the final major pandemic-era restrictions on international travel faded from view, jet/kerosene use led gains, rising by 370 kb/d. With a return to incremental growth, this is expected to fall to only 40 kb/d this year. The two major road fuels saw contrasting fortunes in 2023. While gasoline demand rose by 230 kb/d, diesel fell by 160 kb/d. Both fuels are expected to lose ground in 2024, falling by 100 kb/d and 210 kb/d, respectively (see *Evolution of 2023 forecast fuel demand growth*).



OECD Americas oil demand growth is set to ease further in 1Q24 (+110 kb/d) and to move into a slight contraction from 2Q24 onwards, leading to a small annual decline of 50 kb/d (-0.2%) this year. An anticipated slowdown in gasoline demand (-100 kb/d) will be tempered by incremental growth in jet/kerosene use and a modest improvement in steam cracker operating rates, each adding about 20 kb/d.

These regional trends will be dominated by developments in the **United States**, where changes to the car fleet are projected to narrowly outweigh the impact of economic growth. In the GDP forecasts used for our balances, growth is expected to halve, to 1.2%, in line with a gradually deepening impact of higher Federal Reserve interest rates. Projected efficiency gains and increased electric vehicle

penetration will be sufficient to outweigh this weaker growth, resulting in an 80 kb/d decline in gasoline demand and a 40 kb/d dip in total oil use.

Preliminary data suggests that US 4Q23 deliveries were 320 kb/d higher y-o-y, with gasoline rebounding by 180 kb/d but gasoil declining by 110 kb/d. This contrast between the two major fuels continues to be driven by the strong performance of the service sector and comparatively robust employment data. The *S&P Global US Services PMI* showed accelerating expansion in December at 51.4, up from 50.8 in November, while the *Manufacturing PMI* remained mired in contraction at 47.9 during December, down from 49.4 a month earlier. The American Trucking Association's (ATA) *Truck Tonnage Index* showed a y-o-y fall in activity of 1.2% in November, which followed a 2.4% drop in October.

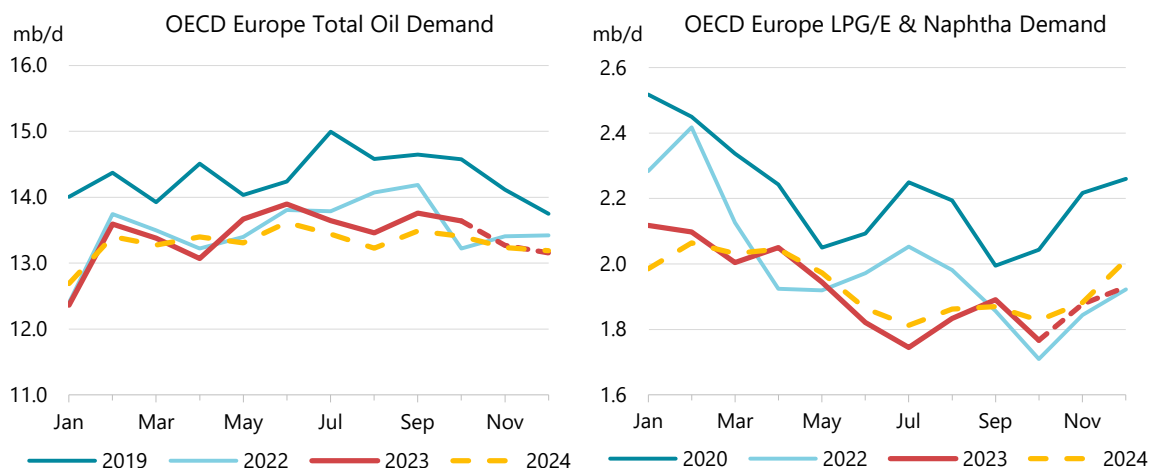
In addition, relatively mild weather in many parts of the United States, especially during December, may also have contributed to this divergence. Better weather boosts mobility and gasoline use but reduces heating requirements. In the United States heating oil (gasoil) and propane are the major oil heating fuels. In December, temperatures were mild where heating oil is most used. Across New England, average heating degree days (HDDs) dropped by between 8% and 17% y-o-y, depending on the state, and in New York and Pennsylvania they fell by 22%.

The rest of the region is expected to post largely stable demand in 2024. In **Canada**, demand will be essentially unchanged. Marginal declines in fuel demand, with gasoline and gasoil both falling by less than 10 kb/d, will be offset by higher LPG/ethane demand, with steam cracker operations gradually gaining ground. **Mexican** demand is set to decline by 20 kb/d, on lower diesel use, with the country's post-pandemic activity surge now exhausted.

The industrial sector in **OECD Europe** remains in deep contraction, with the *HCOB Eurozone Manufacturing PMI* at 44.4 in December. This is evident in very weak diesel and naphtha demand. Diesel use tumbled by 90 kb/d (-1.8%) y-o-y in 4Q23 to stand 290 kb/d below 4Q19. Overall, gasoil deliveries fell by 200 kb/d in 2023 and we expect this slide to persist this year (-160 kb/d). Gasoil demand is falling structurally in Europe as the continent's drivers move away from diesel cars in favour of gasoline and electric vehicles, and as oil-based heating systems are gradually replaced by gas boilers and electric heat pumps.

So far, the 2023/24 winter has seen a virtual repeat of the extremely mild weather conditions from 2022/23. Indeed, in some European countries where significant amounts of oil are used for heating (notably Germany), this winter has actually been warmer on average, especially during December. Compared to our earlier forecast for a more typical winter, this will likely reduce heating oil deliveries by around 70 kb/d in Europe, although as in the United States there may have been some support to gasoline and road diesel consumption (See *Milder weather reduces heating fuel use but potential for volatility remains* in October 2023 OMR).

German Federal Statistical Office figures show that road freight activity softened consistently in Europe's largest economy during 2022 and 2023, in line with the continent-wide manufacturing slowdown. This resulted in a y-o-y drop of 4.4% in oil demand (-90 kb/d) during 4Q23, while overall GDP dipped by 0.3%. In combination with structural drivers, we expect German gasoil demand to decline by 30 kb/d in 2024. The country's total oil consumption will go down by less than 20 kb/d, which would be the third straight year of lower oil use.



Europe's petrochemical sector, and by extension naphtha use, remains in very poor health. Regional naphtha deliveries dropped by 20 kb/d in 4Q23, from an extremely low base, and were 390 kb/d (-27%) lower than two years earlier. Given that this is as much the result of intensifying interregional competition as it is weakness in domestic demand, a meaningful recovery is difficult to foresee this year. We expect demand for naphtha to remain at about the same level in 2024 (+10 kb/d).

As with several other regions, gasoline markedly outperformed gasoil in Europe last year (rising by 90 kb/d or 4.3%). The increasing share in the road fleet of gasoline-fuelled vehicles and robust personal mobility and services activity should see regional demand for the fuel increase marginally (+10 kb/d) this year, defying the overall slowdown.

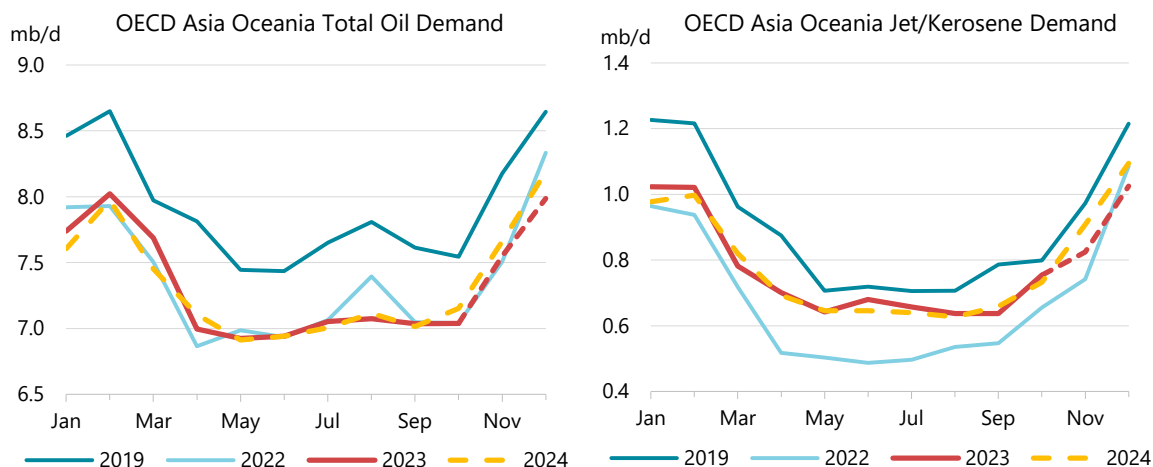
Jet/kerosene will also benefit from comparatively resilient mobility and is forecast to increase by 20 kb/d. Nevertheless, this is a major deceleration compared to the 150 kb/d gain last year. The post-Covid rebound in the European tourism sector seems to be largely complete and the decline in growth is set to be most obvious in some of the continent's major leisure destinations, which dominated last year's increase.

In **OECD Asia Oceania**, deliveries contracted by an average of 110 kb/d during 2H23. This was most notably due to falling petrochemical operating rates, with naphtha demand declining by an average of 80 kb/d (-4.4%). Naphtha accounts for about a quarter of OECD Asia Oceanian demand, far higher than for any other region in the world, meaning that consumption is uniquely exposed to changes in the sector. Even so, petrochemical operators in Japan and Korea held up well compared to their European peers in 2023. Naphtha deliveries last year were 8.6% lower than 2021 compared to a 32% decline in Europe over the same period. We estimate that 2024 consumption will be almost unchanged. However, operators remain highly exposed to the neighbouring Chinese market and further intensification of the competition in global markets could see deeper losses in market share.

In common with the other OECD regions, 4Q23 saw rather mild temperatures in both Japan and Korea, especially in December. Oil products play an especially important role for heating in Japan and a y-o-y decline of in HDDs of 8% for the quarter implies a drop in combined kerosene, heating oil and LPG requirements of around 80 kb/d.

For 2024, we project a very slight increase, about 10 kb/d, in total regional oil use. This is comprised of small contractions in road fuels and narrow gains in other areas. EVs are playing a smaller role than in the other OECD regions because of economic factors and a greater focus on hybrid vehicles. Nevertheless, substantial gains in the efficiency of internal combustion engine (ICE) vehicles, to which sales of new hybrids are a major contributor, may be enough to outweigh the impact of modest

GDP growth in 2024 (our balances assume rises of 0.7% in Japan, 1.4% in Korea and 1.2% in Australia).



Australia will see a major slowdown in growth this year. It will go from gains of almost 60 kb/d (+5.2%) in 2023, two-thirds from higher jet fuel use, to next to no increase in 2024. Last year, the headline rise benefitted from comparison to 2022, which was impacted by anti-Covid measures. This was especially relevant for aviation, where activity recovered to close to 2019 levels by early 2Q23. Nevertheless, jet/kerosene use remained almost 13% lower, mainly due to efficiency improvements because of aircraft replacement. Our forecasts assume some y-o-y growth in air traffic, due to the relatively weak first quarter baseline and more modest incremental gains thereafter. Jet/kerosene deliveries are expected to rise by 5 kb/d, but still remain 10.1% lower than 2019.

OECD Demand based on Adjusted Preliminary Submissions - November 2023

(million barrels per day)

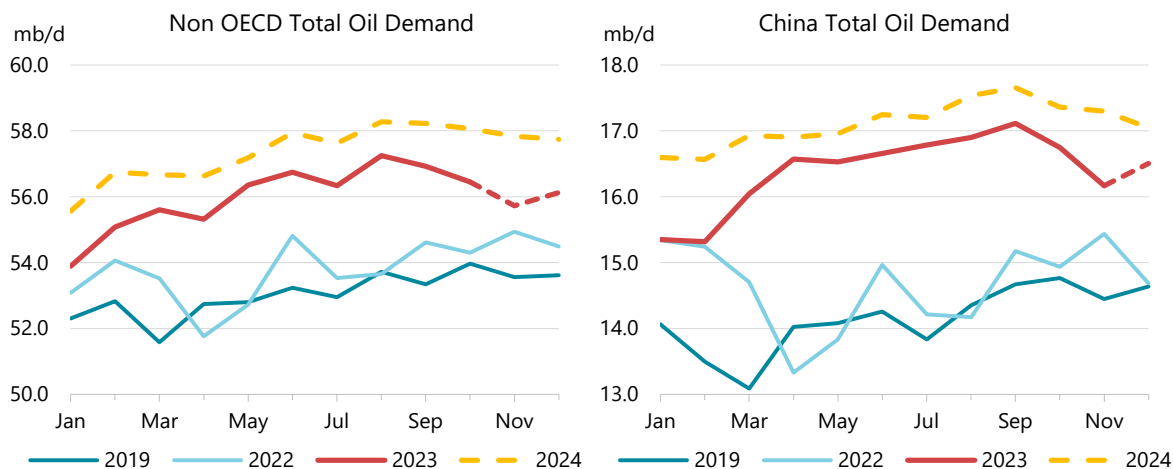
	Gasoline		Jet/Kerosene		Diesel		Other Gasoil		LPG/Ethane		RFO		Other		Total Products	
	mb/d	% pa	mb/d	% pa	mb/d	% pa	mb/d	% pa	mb/d	% pa	mb/d	% pa	mb/d	% pa	mb/d	% pa
OECD Americas	10.32	-1.0	1.93	4.5	3.33	-1.9	1.79	-3.5	4.08	1.5	0.50	-13.7	2.81	-5.9	24.77	-1.4
US*	8.82	-0.4	1.65	2.5	2.52	-2.4	1.46	-3.9	3.22	1.3	0.32	-19.6	2.16	-3.4	20.14	-1.1
Canada	0.77	-3.5	0.16	32.9	0.36	2.8	0.27	-2.6	0.42	3.5	0.02	21.2	0.42	-18.7	2.43	-2.6
Mexico	0.64	-4.8	0.10	6.9	0.27	-6.8	0.06	2.4	0.41	1.2	0.15	-4.9	0.20	-4.4	1.82	-3.0
OECD Europe	1.99	-2.9	1.35	9.5	4.85	-4.0	1.37	3.1	1.04	5.2	0.72	-5.5	1.96	-2.2	13.27	-1.0
Germany	0.47	3.6	0.19	4.3	0.70	-7.3	0.32	10.1	0.10	5.4	0.04	-14.8	0.27	-21.7	2.10	-3.7
United Kingdom	0.28	-1.8	0.31	16.6	0.48	-3.6	0.11	4.0	0.08	-10.7	0.02	14.4	0.11	8.9	1.39	2.0
France	0.19	-18.0	0.17	8.9	0.68	-7.2	0.11	-1.7	0.08	24.3	0.04	3.7	0.23	37.9	1.50	0.0
Italy	0.15	-17.3	0.09	18.7	0.49	-4.9	0.04	-24.4	0.11	2.8	0.05	-6.2	0.22	1.3	1.14	-4.4
Spain	0.14	7.3	0.13	7.6	0.44	-1.8	0.20	-3.5	0.08	2.5	0.12	-5.1	0.16	6.0	1.27	0.6
OECD Asia & Oceania	1.44	0.3	0.82	11.1	1.51	2.2	0.42	-6.9	0.77	-3.5	0.48	-7.5	2.10	1.1	7.55	0.6
Japan	0.78	-1.2	0.42	5.5	0.43	-2.0	0.29	-7.0	0.39	-1.4	0.25	-10.6	0.84	-1.0	3.40	-1.8
Korea	0.26	10.9	0.20	20.1	0.44	10.9	0.06	-11.3	0.32	-5.7	0.19	-7.5	1.10	3.0	2.56	3.7
Australia	0.28	-2.7	0.15	19.0	0.57	-0.5	-	-	0.04	-3.0	0.02	1.3	0.10	-0.7	1.17	0.8
OECD Total	13.75	-1.1	4.11	7.4	9.69	-2.4	3.58	-1.5	5.90	1.4	1.69	-8.6	6.86	-2.8	45.59	-1.0

* Including US territories.

Non-OECD

Non-OECD oil demand rose by 1.5 mb/d y-o-y in 4Q23 – a considerable slowdown from the 3 mb/d growth rate registered during the second and third quarters. Predictably, this pattern matches China's intra-year profile, with the country accounting for about 80% of non-OECD gains in 2023. This fourth quarter easing results in an average annual increase of 2.2 mb/d, slowing to 1.4 mb/d in 2024 as baselines normalise after the pandemic years while the economic climate remains

challenging for emerging markets. China, driving about half of the region's gains this year, remains the main source of growth by a large margin.

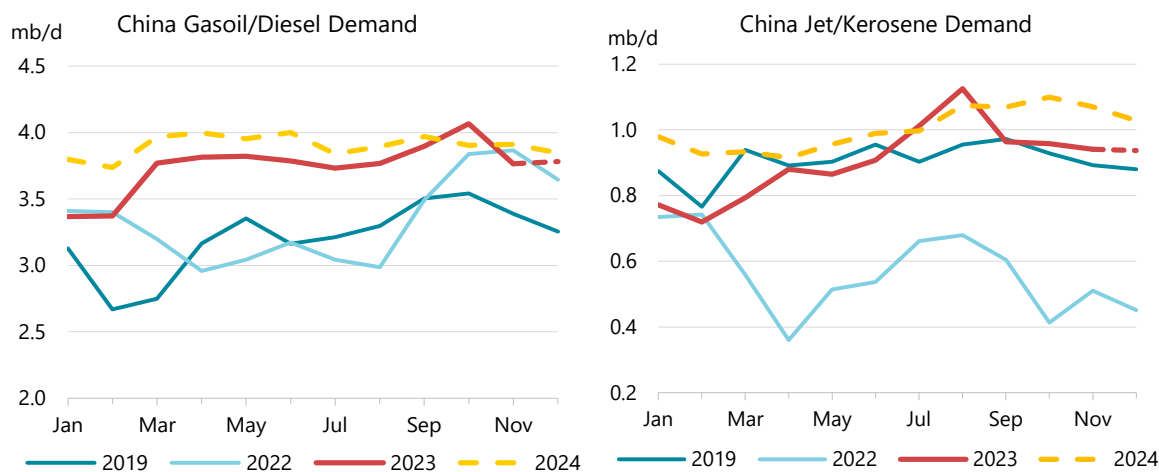


China's apparent oil demand fell by 580 kb/d m-o-m to 16.2 mb/d in November, as cooling product deliveries, already visible in October, accelerated. Gasoil and gasoline accounted for the bulk of the decline, as refinery runs slumped while net product imports were stable. Deliveries were the lowest since March and about 1 mb/d below their all-time highs set in September (the last of 2023's five monthly records). Accordingly, 4Q23 growth of 1.5 mb/d y-o-y appears muted compared to 2Q23-3Q23 levels of 2.5 mb/d, as these quarters incorporate the full impact of the pent-up travel demand release. This results in average annual 2023 demand growth of 1.7 mb/d (a record) with the increase distributed more or less evenly across the key products. As in 2022, naphtha (+580 kb/d y-o-y) is the main driver, with gasoil, gasoline, jet/kerosene and LPG/ethane each accounting for about 350-400 kb/d. Gains will slow to 710 kb/d in 2024, with naphtha (+310 kb/d) again accounting for the lion's share.

China: Demand by Product								
(thousand barrels per day)								
	Demand				Annual Chg (kb/d)		Annual Chg (%)	
	2021	2022	2023	2024	2023	2024	2023	2024
LPG & Ethane	1 943	2 116	2 470	2 639	354	169	16.7	6.9
Naphtha	1 577	1 817	2 392	2 705	575	313	31.7	13.1
Motor Gasoline	3 513	3 373	3 700	3 784	328	84	9.7	2.3
Jet Fuel & Kerosene	787	563	907	1 003	344	96	61.2	10.6
Gas/Diesel Oil	3 242	3 337	3 747	3 901	410	154	12.3	4.1
Residual Fuel Oil	545	592	606	626	14	20	2.4	3.3
Other Products	3 480	2 867	2 574	2 452	- 293	- 122	-10.2	-4.8
Total Products	15 088	14 664	16 397	17 110	1 732	714	11.8	4.4

Petrochemical feedstock deliveries consolidated at last month's elevated levels, with a -80 kb/d m-o-m decline in LPG/ethane, to 2.3 mb/d, offset by an equivalent increase in naphtha to 2.5 mb/d. It was the first time since March that naphtha deliveries surpassed LPG/ethane volumes. This comparative weakness in LPG/ethane was already apparent in October, indicating that relatively steep propane prices are incentivising substitution between the two feedstocks. More generally, this suggests falling run rates at some steam crackers and propane dehydrogenation (PDH) plants are unable to fully absorb the global oversupply in NGLs. In view of these developments, as well as the generally unfavourable global economic outlook, combined naphtha/LPG/ethane gains of 930 kb/d in 2023 are set to decelerate to 480 kb/d in 2024. Still, petrochemical products will bolster their status as China's chief engine of demand growth in relative terms, increasing their share of the total product growth mix from 54% in 2023 to 68% in 2024.

Gasoline deliveries reached 3.6 mb/d in November – a 310 kb/d m-o-m decline from October's all-time high, with usage now at its lowest in six months. City-level road congestion calculated from *Baidu* data remained elevated in November, consolidating near 2023's peak – suggesting that the monthly drop partly reflects a temporal offset for October's record strength. Gasoline demand growth is on track to ease from 330 kb/d on average in 2023 to 80 kb/d in 2024. This is the slowest among the major refined products, with deliveries plateauing at about 3.8 mb/d. Headwinds, such as a weaker economic outlook and the easing of the post-lockdown travel surge in 2023, are compounded by soaring electric vehicle sales. These reached a new monthly high of 1.03 million in November, according to the China Association of Automobile Manufacturers, registering a 30% y-o-y increase.



Similarly to gasoline, gasoil usage in November ebbed from its recent resilience, falling 300 kb/d m-o-m (-100 kb/d y-o-y) – well short of typical seasonal strength. Unlike other product categories, deliveries have barely increased since March, when the impact of the reopening rebound first materialised in delivery data. PMIs reflect the gradual fading of the economic optimism prevalent in the wake of the reopening, with the official manufacturing and services gauges ending the year near a neutral 50, having slid continually from 1Q23's annual highs. Other data readings also indicate persistently lacklustre domestic activity. Industrial output and retail sales came in below expectations in November, rising by 6.6% and 10.1% y-o-y, respectively, but flattered by a low lockdown-affected 2022 base. Moreover, the deflationary trend that began in July deepened, with consumer prices falling 0.3% y-o-y in December. Construction remains in a deep slump – sales of the country's 100 largest property developers were down by 30% y-o-y in November, while home prices fell by 0.4% m-o-m, their sixth straight monthly decline. Gasoil demand growth will slow from 410 kb/d in 2023 to 150 kb/d in 2024 amid a persistently unfavourable economic outlook.

Jet/kerosene use fell by 20 kb/d m-o-m in November (+430 kb/d y-o-y and about 50 kb/d above 2019 levels). Having peaked in August (when jet/kerosene consumption exceeded 2019 usage by 170 kb/d), 2023's release of pent-up travel has by now largely dissipated – a pattern also confirmed by *Radarbox* flight data. While domestic flight traffic has settled at about 115% of pre-pandemic levels, international flights have stalled at about 90% of 2019 volumes, as the economic malaise makes consumers reluctant to spend on luxury items. The weak yuan (the currency has fallen about 10% against the US dollar over the past two years) acts as a further deterrent to foreign travel. This results in average 2023 jet/kerosene demand of 910 kb/d (almost equal to 2019) and 340 kb/d y-o-y of annual growth slowing to 100 kb/d in 2024.

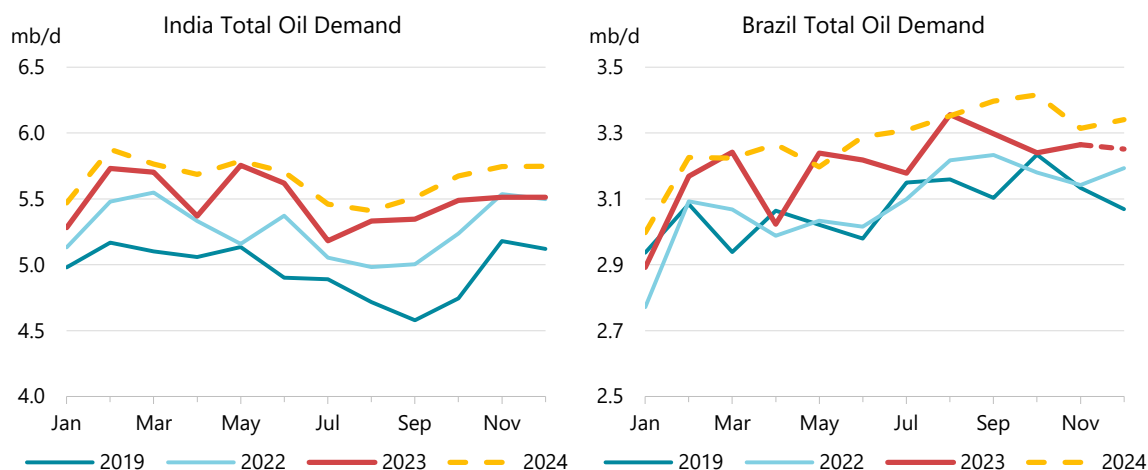
Middle Eastern deliveries fell by 50 kb/d y-o-y in 4Q23, with average annual gains also a lacklustre 50 kb/d. This concludes a rocky year, with robust deliveries in jet fuel and fuel oil/crude for power generation largely offset by soft LPG/ethane volumes, as its petrochemical sector struggles in the

face of intense Chinese competition. However, 2024 is expected to see a rebound, defying the slowdown elsewhere, as oil use recovers due to a pick-up in the economic outlook. Our forecast assumes GDP growth for the Gulf Cooperation Council region of 4% in 2024, compared to 0.5% in 2023, propelled by non-energy industries such as travel, tourism and construction. This more than compensates for GDP's flat oil component. As crude prices are generally below fiscal break-even levels, this expansion will partly be financed by expanding fiscal deficits. We have raised our 2024 demand growth forecast by 30 kb/d compared to last month's *Report*, to 130 kb/d y-o-y. Summer weather, especially a possible repeat of the 2022-23 heatwaves that severely stretched the region's power grids, is the key wildcard.

Indian demand, after having dipped into annual contraction in November, shifted back into expansion in December, at +10 kb/d y-o-y. Static m-o-m deliveries dovetail with typically flat seasonality and cap average 2023 consumption at 5.5 mb/d (+210 kb/d y-o-y). This increase was the highest of any country in the world after China and was propelled by stellar GDP growth, itself buoyed by secular trends such as benign demographics, urbanisation and industrialisation. The Reserve Bank of India raised its 2024 GDP projection by half a point to 7% in December, which would make it the world's fastest growing major economy for a third straight year. The IMF projects that India will contribute more than 16% to global economic growth this year.

However, the country is not immune to the slump in global activity and trade, weighing on its exports and adding to its chronic current account deficit. A case in point is the persistent weakness in its currency - the rupee has fallen against the US dollar in 12 of the past 13 years. India's budget deficit remains elevated at 5.9% in 2023-24, in part due to the country's intricate scheme of subsidies and price controls for food and energy. Pump prices for gasoline and diesel have remained unchanged since June 2022, according to *GlobalPetrolPrices.com* (GPP) data and will probably stay stable until at least the May election.

Oil demand growth has been slowing for three consecutive quarters, to 80 kb/d y-o-y in 4Q23. We see gains of about 130 kb/d y-o-y during 1H24, before picking up somewhat in 2H24 as the global economic climate improves. Average 2024 consumption growth is forecast at 170 kb/d, in line with the 2010-19 average of 160 kb/d.



Brazilian oil consumption rose by 80 kb/d y-o-y in 4Q23. Weather has been a key driver of the country's oil demand of late, after an El Niño pattern developed, contributing to a severe heatwave (Brazil recorded its hottest ever temperature, 44.8°C, in November). With hydropower availability scarce (the Amazon River basin fell to its lowest level in over 100 years), this has boosted use of

fuel oil and gasoil for backup power generation, with consumption of both fuels flat m-o-m in November but about 40 kb/d ahead of typical seasonal weakness.

El Niño – typically bringing drought to the north and heavy rainfall to the south – sent soybean planting (Brazil’s most valuable crop by far) off to its slowest start in almost a decade. While this prompted national crop agency Conab to reduce its forecast in December, it still expects a record 2024 crop, improving 3% on 2023’s previous high. Along the same line, abundant rains have improved sugarcane crop prospects – here too, Conab expects an all-time high in 2024, up 11% y-o-y. As meteorologists see the El Niño pattern persisting through 1Q24 - coinciding with the soybean harvest - we have increased our outlook for the first quarter by 20 kb/d to 50 kb/d y-o-y, largely in gasoil.

Brazil’s booming agribusiness sector has made it a favourite with investors - the country is the fifth-largest destination of foreign direct investment in the world. As was the case last year, the real was one of the best performing major currencies, gaining 9% against the US dollar in 2023, while the Bovespa stock index rallied 22%. Strong demand for the country’s commodity exports have buoyed its trade surplus, rendering Brazil impervious to the macroeconomic turmoil and balance of payment crises that plagued other emerging nations. This helps to cushion the impact of a slowing economy – analysts’ consensus sees GDP growth slowing from 3% in 2023 to 1.5% in 2024. We have increased our 2024 oil demand growth forecast by 20 kb/d compared to last month’s *Report*, to 80 kb/d. These gains are in line with their pre-pandemic trend and compare to 110 kb/d in 2023.

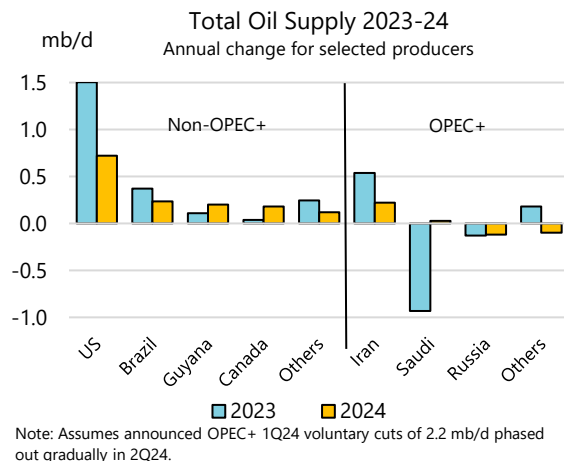
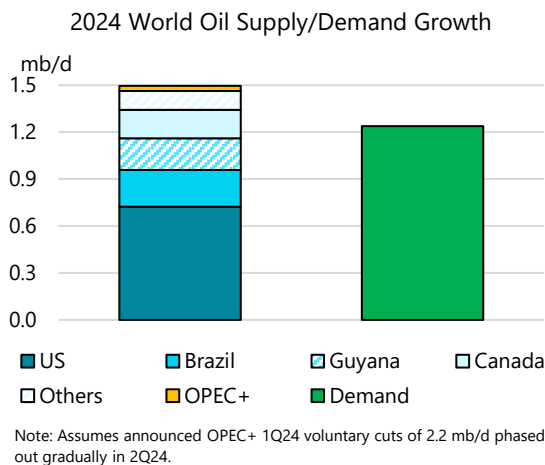
Argentinean deliveries were flat y-o-y in 4Q23, as November saw the election of Javier Milei as president on a “shock therapy” economic programme of slashed public spending, privatisations, and the pursuit of market-oriented policies. While no immediate dollarisation will take place, Argentina sharply devalued the peso by 54%. Gasoline and diesel pump prices soared by around 40% in the week following the move, according to data from *GPP*. Further price hikes are on the cards as state oil company YPF (itself in line to be privatised) is set to curtail energy subsidies in favour of a more market-based scheme. Grains export revenues may cushion some of the immediate economic hardship, with 2024 soybean production seen doubling from last year’s drought-plagued levels, according to estimates by the U.S. Department of Agriculture. In this context, we have narrowed the decline in our average 2024 outlook by 10 kb/d, to -20 kb/d. This compares to flat consumption growth in 2023.

Non-OECD: Demand by Region								
(thousand barrels per day)								
	Demand				Annual Chg (kb/d)		Annual Chg (%)	
	2021	2022	2023	2024	2023	2024	2023	2024
Africa	4 052	4 283	4 247	4 358	- 36	111	-0.8	2.6
Asia	28 616	28 720	30 789	31 844	2 069	1 055	7.2	3.4
FSU	4 891	4 945	4 928	4 901	- 17	- 27	-0.3	-0.6
Latin America	6 004	6 207	6 338	6 440	131	102	2.1	1.6
Middle East	8 350	8 848	8 902	9 034	54	133	0.6	1.5
Non-OECD Europe	771	785	787	799	2	12	0.3	1.5
Total Products	52 684	53 788	55 991	57 376	2 203	1 385	4.1	2.5

Supply

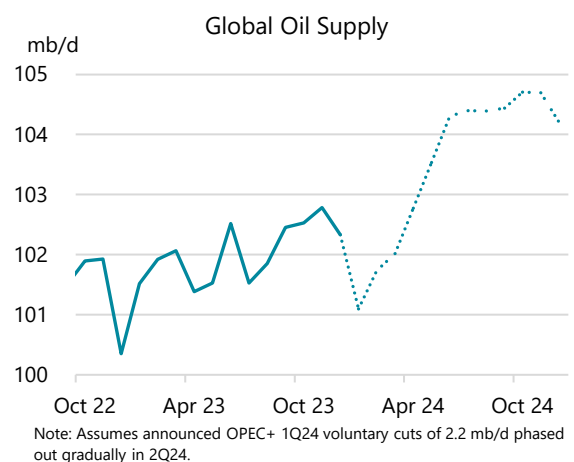
Overview

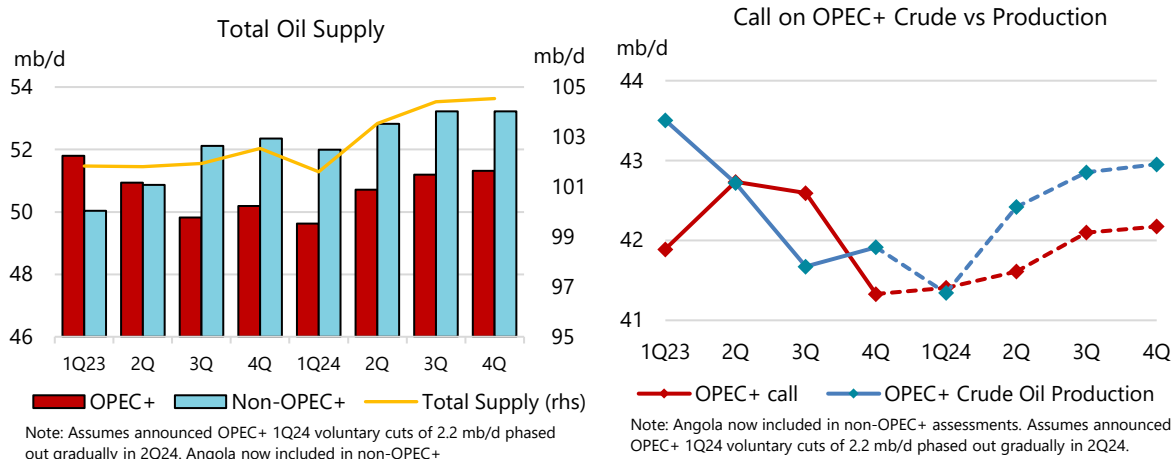
Record-breaking output from the United States, Brazil, Guyana and Canada will drive non-OPEC+ gains in 2024, with global supply forecast to rise by 1.5 mb/d to a new high of 103.5 mb/d, outpacing demand growth. These four non-OPEC+ producers, all from the Americas, are expected to add a combined 1.3 mb/d, with the United States contributing more than half the gains to once again lead the world's supply expansion. Mirroring trends in 2023, non-OPEC+ output will dominate growth this year - accounting for close to 1.5 mb/d. By contrast, OPEC+ production is expected to hold broadly steady on last year assuming that extra voluntary cuts that started this month are phased out gradually in the second quarter. Iran, despite being under sanctions, is poised to rank as the third largest source of growth after the United States and Brazil. And, as things now stand, Russia, also under sanctions, may see the largest decline.



In 2023, global oil supply rose by 1.9 mb/d to an average annual 102 mb/d. US oil output accounted for two-thirds of the 2.3 mb/d increase from non-OPEC+. Supply from OPEC+ fell 390 kb/d, with Saudi Arabia's production down by more than 900 kb/d on average while some other members of the alliance with output targets made very modest reductions. The bloc's overall decline was partially offset by Iran, exempt from supply cuts, which boosted output to a five-year high.

As 2024 gets underway, Middle East geopolitical tensions are firmly in focus for oil markets. Most recently, US and UK strikes on Houthi targets in Yemen in response to their continued attacks on Red Sea shipping have raised concern of a further escalation and a deeper impact on regional oil flows, particularly via the Suez Canal. Roughly 10% of the world's oil supply transits this vital waterway and 20% via the Strait of Hormuz. A rising number of ship owners are diverting course from the Suez Canal, delaying deliveries of oil and other commodities.





A sharp decline in global oil output is meanwhile expected this month as a blast of cold weather that's sweeping through the United States and Canada takes a toll on oil operations and some OPEC+ producers make new supply reductions. In December, a seasonal decline in biofuels output dragged down world oil supply by 490 kb/d to 102.3 mb/d. Losses were mitigated by higher flows from Guyana and Nigeria.

World Oil Production by Region (OPEC+ based on current agreement)

(million barrels per day)

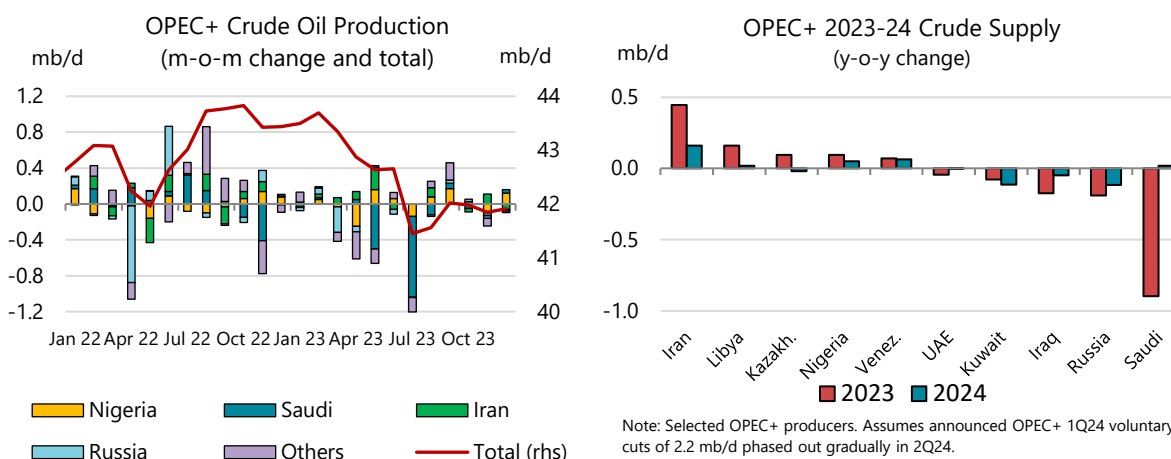
	2022	1Q23	2Q23	3Q23	4Q23	2023	1Q24	2Q24	3Q24	4Q24	2024
Africa	7.1	7.2	7.1	7.2	7.3	7.2	7.3	7.3	7.2	7.2	7.2
Latin America	6.4	6.8	6.9	7.2	7.4	7.1	7.5	7.6	7.6	7.6	7.6
North America	25.7	26.7	26.8	27.7	28.1	27.3	27.8	28.1	28.3	28.6	28.2
China	4.2	4.3	4.3	4.2	4.2	4.3	4.3	4.4	4.3	4.3	4.3
Other Asia	3.2	3.2	3.1	3.1	3.1	3.1	3.1	3.0	3.0	3.0	3.0
Europe	3.3	3.4	3.3	3.1	3.3	3.3	3.3	3.2	3.2	3.3	3.2
FSU	13.9	14.1	13.8	13.6	13.8	13.8	13.6	13.7	13.7	13.8	13.7
Middle East	31.1	31.2	30.8	29.8	29.8	30.4	29.5	30.4	31.0	31.0	30.5
Total Oil Production	94.8	96.8	96.2	95.9	97.0	96.5	96.4	97.7	98.3	98.8	97.8
Processing Gains	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Global Biofuels	2.9	2.7	3.3	3.6	3.2	3.2	2.8	3.4	3.7	3.3	3.3
Total Supply	100.1	101.8	101.8	101.9	102.5	102.0	101.6	103.5	104.4	104.5	103.5
<i>OPEC Crude</i>	27.9	28.3	27.8	26.9	27.0	27.5	26.6	27.6	28.1	28.1	27.6
<i>OPEC NGLs*</i>	5.4	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.6	5.6	5.6
<i>Non-OPEC OPEC+</i>	17.7	18.0	17.7	17.5	17.7	17.7	17.5	17.6	17.5	17.6	17.6
Total OPEC+	51.1	51.8	50.9	49.8	50.2	50.7	49.6	50.7	51.2	51.3	50.7
<i>Memo: Call on OPEC</i>	27.3	26.7	27.8	27.8	26.5	27.2	26.7	26.8	27.3	27.3	27.0

* Includes condensates reported by OPEC countries, oil from non-conventional sources, e.g. GTL in Nigeria and non-oil inputs to Saudi Arabian MTBE.

The fourth quarter of 2023 saw higher than forecast US, Brazilian and Canadian supply combine with decelerating demand growth to fend off an anticipated oil market deficit. The upward adjustment in 4Q23 oil supply included sharply higher data from Canada (+150 kb/d), following data revisions by the government, US NGLs (+190 kb/d), Brazil (+80 kb/d) and China (+70 kb/d). However, the 1Q24 extension and deepening of OPEC+ supply curbs may remove enough oil to push the world oil market into a shallow deficit at the start of the year. From 2Q24 onwards, our balances suggest that strong non-OPEC+ supply growth could leave OPEC+ pumping above the requirement for its crude oil if extra voluntary cuts are unwound in the second quarter.

OPEC+ crude supply

OPEC+ crude oil output from all 22 member countries rose by 30 kb/d to 41.85 mb/d in December after higher flows from Nigeria and smaller increases from Iraq, Saudi Arabia and Kazakhstan offset losses in Iran, Kuwait and elsewhere. But production this month is expected to drop as the group's extra supply curbs kick in and as protests forced the closure of Libya's largest oil field. Angola left OPEC effective 1 January 2024 and from this *Report* onwards will be included in our non-OPEC+ data (see *Angola quits OPEC after 2024 quota dispute*).



Supply from OPEC's current 12 members rose by 50 kb/d in December to 27.02 mb/d, while flows from the 10 non-OPEC nations edged 20 kb/d lower to 14.83 mb/d. Overall output from the 18 producers subject to quotas was 390 kb/d below an implied target of 35.46 mb/d. That left the group's effective spare capacity, excluding sanctions-hit Iran and Russia, at 5.4 mb/d, with Saudi Arabia accounting for around 60% of the cushion.

OPEC+ members have meanwhile begun to implement 1Q24 oil supply curbs totalling 2.2 mb/d – led by Saudi Arabia prolonging its existing additional 1 mb/d cut – to stave off a sizeable build in inventories from higher non-OPEC+ output. Russia has committed to extend and deepen its export curbs of crude oil and oil products to 500 kb/d, while other key OPEC+ producers, including Iraq, Kuwait and the UAE, pledged a further combined reduction of 700 kb/d.

We believe the voluntary curbs are likely to result in an actual reduction of around 500 kb/d compared to 4Q23 – still potentially deep enough to push world oil markets into a slight deficit at the start of the year. The 2.2 mb/d 1Q24 voluntary curbs are on top of a 2 mb/d cut to the OPEC+ output ceiling in place since November 2022 and additional cuts of 1.7 mb/d from some members that started in May. OPEC+ plans to hold a Joint Ministerial Monitoring Committee meeting on 1 February to review the enforcement of the current supply deal.

Crude oil supply from **Saudi Arabia** in December rose 30 kb/d to just below 9 mb/d, a level Riyadh has pledged to sustain through the first three months of 2024. Massive voluntary cuts, in place since last July, slashed the Kingdom's average 2023 crude output to 9.6 mb/d – a 900 kb/d decline, the largest of any producer. **Kuwaiti** crude oil output declined by 50 kb/d to 2.55 mb/d. It has promised to cut an extra 140 kb/d from this month. For 2023 as a whole, its crude oil production fell 80 kb/d to 2.6 mb/d.

OPEC+ Crude Oil Production (excluding condensates)						
(million barrels per day)						
	Nov 2023	Dec 2023	Dec Prod vs	Dec 2023	Sustainable	Cap
	Supply	Supply	Target	Implied Target ¹	Capacity ²	vs Dec ³
Algeria	0.96	0.95	-0.01	0.96	1.0	0.1
Congo	0.25	0.26	-0.05	0.31	0.3	0.0
Equatorial Guinea	0.05	0.05	-0.07	0.12	0.1	0.0
Gabon	0.23	0.22	0.05	0.17	0.2	0.0
Iraq	4.29	4.33	0.11	4.22	4.8	0.4
Kuwait	2.60	2.55	0.00	2.55	2.8	0.3
Nigeria	1.25	1.35	-0.39	1.74	1.4	0.0
Saudi Arabia	8.92	8.95	-0.03	8.98	12.2	3.2
UAE	3.24	3.23	0.36	2.88	4.2	1.0
Total OPEC-9⁴	21.79	21.89	-0.03	21.92	27.0	5.1
Iran ⁵	3.21	3.15			3.8	
Libya ⁵	1.17	1.18			1.2	0.0
Venezuela ⁵	0.80	0.80			0.8	0.0
Total OPEC	26.97	27.02			32.8	5.1
Azerbaijan	0.49	0.48	-0.20	0.68	0.5	0.1
Kazakhstan	1.57	1.60	0.05	1.55	1.7	0.1
Mexico ⁶	1.64	1.65			1.7	0.0
Oman	0.80	0.80	0.00	0.80	0.9	0.0
Russia	9.50	9.48	0.03	9.45	10.0	
Others ⁷	0.85	0.82	-0.24	1.06	0.9	0.0
Total Non-OPEC	14.86	14.83	-0.36	13.54	15.6	0.3
OPEC+ 18 in Nov 2022 deal⁵	35.01	35.07	-0.39	35.46	40.9	5.3
Total OPEC+	41.83	41.85			48.4	5.4

1 Includes extra voluntary curbs where announced.

2 Capacity levels can be reached within 90 days and sustained for extended period.

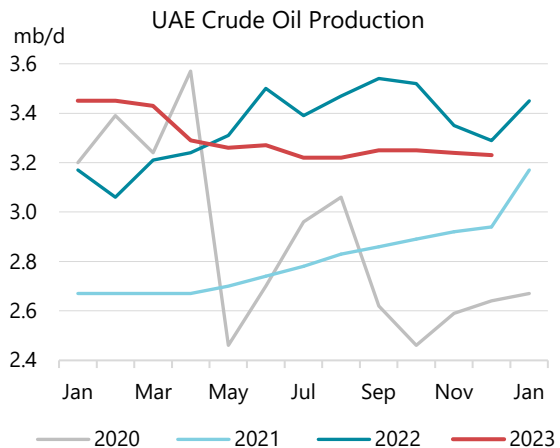
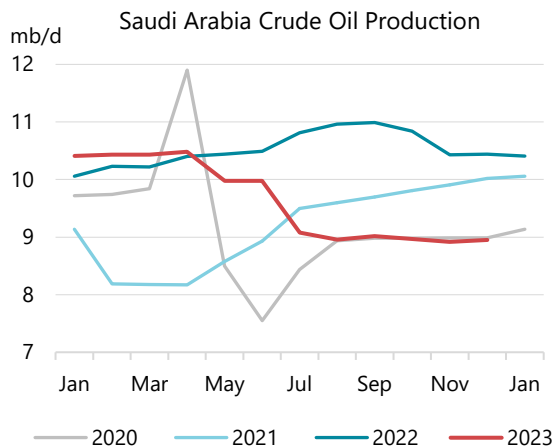
3 Excludes shut in Iranian, Russian crude. 4 Angola left OPEC effective 1 Jan 2024.

5 Iran, Libya, Venezuela exempt from cuts.

6 Mexico excluded from OPEC+ compliance.

7 Bahrain, Brunei, Malaysia, Sudan and South Sudan.

Flows from the **UAE** dipped to 3.23 mb/d, 360 kb/d above its implied quota. It announced a new cut of 160 kb/d from 1Q24 which is essentially cancelled out by a previously negotiated higher quota for 2024. Its crude oil output in 2023 was broadly steady at 3.3 mb/d, holding near record annual levels. Supply from **Oman** was unchanged m-o-m at 800 kb/d. It pledged to cut an extra 40 kb/d in 1Q24.

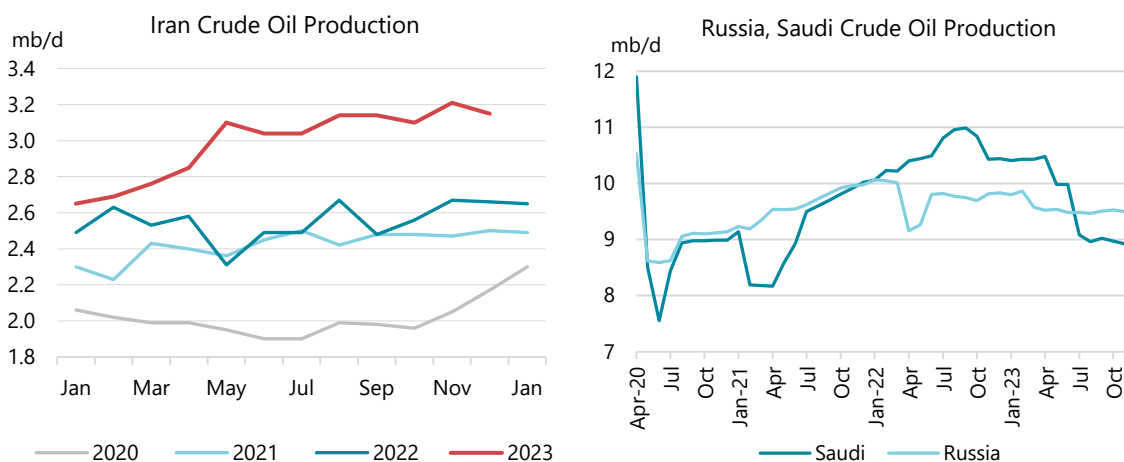


Iraqi production rose 40 kb/d in December on higher exports and internal consumption. At 4.33 mb/d, output was 110 kb/d above its implied target. Baghdad has vowed to curb supplies by an additional 220 kb/d in 1Q24. Shipments of around 450 kb/d from northern oil fields via the Iraq-Türkiye pipeline remained suspended for the ninth month running due to a lingering dispute between Baghdad and companies operating in the Kurdistan region.

PetroChina has meanwhile taken over as operator of West Qurna-1 following ExxonMobil's official departure. PetroChina now holds the largest share (32.7%) in the 550 kb/d southern oil field. Basrah Oil Co agreed last year to acquire 22.7% of Exxon's stake in the field, while Pertamina bought the

remaining 10%, doubling its holding. Itochu has a 19.6% interest while another Iraqi state company owns 5%. Iraq and PetroChina have plans to raise output to 600 kb/d at the end of 2024. Iraq pumped roughly 4.3 mb/d on average in 2023, down 175 kb/d y-o-y.

In **Iran**, crude oil supply decreased by 60 kb/d in December to 3.15 mb/d along with lower shipments of oil, primarily to China, according to preliminary tanker tracking data. In 2023, Tehran ranked as the world's second largest source of growth after the United States with supply rising 445 kb/d to an average 3 mb/d, the highest since 2018. Iran could post a fourth straight year of annual growth in 2024 if it can sustain recent production rates. Exports of crude oil and condensates rose by 430 kb/d to an average 1.3 mb/d in 2023, according to *Kpler* data. Before the former US administration withdrew from the Joint Comprehensive Plan of Action (JCPOA) in 2018, exports of Iranian oil had been running above 2 mb/d.



Russian crude output inched down 20 kb/d to 9.48 mb/d in December. Moscow promised to curb oil exports by 300 kb/d from September through the end of 2023, but preliminary estimates show total crude and product exports of 7.8 mb/d in December compared with the May-June average of 7.4 mb/d. Total supply of crude, condensates and NGLs in December was 10.9 mb/d. For 2023, total oil production was 10.96 mb/d, down 130 kb/d y-o-y. For 1Q24, Moscow has pledged to deepen its export reduction to 500 kb/d.

Russian oil export revenues slide to lowest since June 2023

The continued weakness in Russian crude export prices held Urals below the G7 price cap on average in December (\$59.63/bbl FOB Primorsk and \$59.65/bbl FOB Novorossiysk, according to *Argus*). Widening discounts to North Sea Dated accounted for about one-third of the roughly \$10/bbl m-o-m fall in Urals prices, with the rest resulting from the outright price decline in international oil prices. While a 500 kb/d m-o-m rise in oil exports to their highest level since March 2023 helped to limit losses for commercial export revenues, they still dropped \$1.4 billion m-o-m to \$14.4 billion, their lowest since June 2023.

Crude price discounts to benchmarks for Urals have deepened under pressure from the expanded US Treasury investigation into ships, their owners and related traders that have transported Russian oil purchased above the G7 price cap. The withdrawal of tankers moving Russian barrels has driven up freight costs by around \$2/bbl since the beginning of the investigation, according to *Argus*. This squeezed estimated trading margins to near zero through mid-December. However, they appear to

have recovered in January to around \$2.75/bbl, a level not seen since August-September. This has undermined the competitiveness of Russian Urals, leading Indian refiners to seek alternatives.

Pressure from the US Treasury investigation may also be impacting Indian imports of other Russian crudes whose prices remain stubbornly above the \$60/bbl threshold. Six cargoes of Pacific Coast Sokol destined for India have reportedly been slowed or diverted. Indian deliveries of Sokol have been reduced since November, with some heading to China.

ESPO, Russia's other key export grade, has benefited from greater stability in its discount versus North Sea Dated, and particularly versus the regional East of Suez benchmark, Dubai M1. The latter discount has narrowed progressively from more than \$11/bbl in February 2023 to around \$5.20/bbl since October. The Chinese buyers dominate the market for this crude and appear unphased by the US Treasury's efforts as related shipping costs have been unaffected.

Total Russian oil export volumes rose 500 kb/d in December to 7.8 mb/d, with crude exports gaining 240 kb/d and products 260 kb/d. December loading crude volumes with unknown destinations remained substantial as of mid-January at 320 kb/d and could yet offset the sharp decline in flows to China (-280 kb/d m-o-m). Those for India already show an increase (+180 kb/d m-o-m). Similarly, product volumes with yet-to-be announced discharge ports amounted to 680 kb/d, more than enough to offset the currently assessed decline in product imports for China (-150 kb/d m-o-m) as well as for other destinations.

Russian Oil Exports (mb/d)														Crude	Products	Export Revenue \$bn
	EU	UK+US	Türkiye	China	India	OECD Asia	Middle East	Africa	LAmerica	Other	Unknown	Total				
2021 avg	3.3	0.6	0.2	1.6	0.1	0.5	0.1	0.1	0.1	0.8	0.0	7.2	4.6	2.6	15.7	
2022 avg	3.0	0.1	0.4	1.9	0.9	0.2	0.2	0.1	0.1	0.6	0.0	7.5	5.0	2.5	19.5	
2023 avg	0.6	0.0	0.7	2.4	1.9	0.0	0.3	0.4	0.2	0.9	0.1	7.5	4.9	2.6	15.3	
Nov 2022	2.2	0.0	0.5	2.0	1.5	0.1	0.3	0.1	0.1	0.8	0.0	7.6	4.9	2.7	17.0	
Dec 2022	1.9	0.0	0.4	2.0	1.6	0.1	0.1	0.3	0.0	0.7	0.0	7.3	4.6	2.7	14.0	
Jan 2023	1.3	0.0	0.5	2.5	1.8	0.0	0.3	0.3	0.1	0.8	0.0	7.8	5.1	2.7	15.0	
Feb 2023	0.5	0.0	0.5	2.4	1.9	0.0	0.4	0.5	0.1	1.0	0.0	7.3	4.9	2.4	12.3	
Mar 2023	0.6	0.0	0.6	2.2	2.2	0.1	0.5	0.5	0.2	1.0	0.0	7.9	4.9	3.0	14.2	
Apr 2023	0.5	0.0	0.6	2.5	2.2	0.1	0.5	0.3	0.2	0.8	0.0	7.7	5.0	2.7	15.0	
May 2023	0.5	0.0	0.7	2.4	2.3	0.0	0.4	0.3	0.2	0.9	0.0	7.7	5.2	2.5	13.9	
Jun 2023	0.5	0.0	0.7	2.3	1.8	0.0	0.4	0.3	0.2	0.8	0.0	7.1	4.8	2.3	13.0	
Jul 2023	0.5	0.0	0.6	2.2	1.7	0.0	0.4	0.4	0.2	0.8	0.1	7.1	4.6	2.4	15.5	
Aug 2023	0.6	0.0	0.7	2.1	1.8	0.1	0.2	0.4	0.2	0.8	0.0	6.8	4.6	2.2	17.0	
Sep 2023	0.6	0.0	0.7	2.4	2.0	0.0	0.4	0.3	0.2	0.9	0.0	7.4	4.8	2.6	18.8	
Oct 2023	0.6	0.0	0.7	2.5	1.9	0.1	0.2	0.3	0.2	1.0	0.1	7.5	5.0	2.5	18.6	
Nov 2023	0.5	0.0	0.9	2.6	1.5	0.0	0.1	0.3	0.3	1.1	0.1	7.3	4.7	2.6	15.8	
Dec 2023	0.5	0.0	0.8	2.2	1.6	0.0	0.1	0.3	0.3	0.9	1.0	7.8	5.0	2.8	14.4	
M-o-M chg	0.0	0.0	0.0	-0.4	0.2	0.0	0.0	0.0	0.1	-0.1	0.9	0.5	0.2	0.3	-1.4	
Y-o-Y chg	-1.4	0.0	0.4	0.1	0.0	-0.1	0.0	0.0	0.3	0.2	1.0	0.5	0.3	0.2	0.4	

Sources: IEA, Argus Media Group, Kpler.

Note: Data in this table were derived by granular analysis and estimates of country of origin data in cases where shipments transit via third countries. They may differ from customs information due to calculation methodology and estimates updates.

Looking back on 2023, total Russian oil export volumes remained stable y-o-y at 7.5 mb/d, with a slight loss in crude (-100 kb/d to 4.9 mb/d) offset by an equivalent gain in products (mainly fuel oil). Oil exports were 300 kb/d below their pre-war average in the first two months of 2022, as products fell by 400 kb/d while crude rose 100 kb/d. Overall exports to the European Union, United States, United Kingdom and OECD Asia stand at negligible levels, and 4.3 mb/d below their pre-war average. At the same time, shipments have risen by 1.8 mb/d to India, 700 kb/d to China, 500 kb/d to Türkiye and 300 kb/d to the Middle East. Russia's monthly average commercial oil export revenues tumbled by \$4.2 billion y-o-y in

2023, split -\$2.4 billion y-o-y for crude exports and -\$1.8 billion for products, to sit \$5.7 billion below their pre-war average when oil prices were notably stronger.

The average Russian crude export price in December fell by \$7.25/bbl m-o-m to around \$64/bbl. Russian crude price discounts versus North Sea Dated widened by around \$2/bbl, extending the trend since mid-October. Argus assessed those for Baltic Urals deeper by \$2.23/bbl m-o-m at -\$18.22/bbl and Black Sea Urals by \$3.95/bbl m-o-m at -\$18.20/bbl. Prices for ESPO FOB Kozmino fell only \$5.85/bbl to \$72.21/bbl, well above the G7 price cap. Its discount versus North Sea Dated widened by only \$0.65/bbl m-o-m to -\$5.64/bbl while those versus Dubai M1 narrowed by \$0.33/bbl to -\$5.11/bbl.

	Russian Crude FOB Export Prices (\$/bbl)					Discounts to N.Sea Dated		
	Oct-23	Nov-23	Dec-23	Oct - Nov	Nov - Dec	Oct-23	Nov-23	Dec-23
North Sea Dated	91.12	83.05	77.85	-8.07	-5.21			
Price Cap	60.00	60.00	60.00					
Russia Wtd Avg	80.23	71.35	64.10	-8.88	-7.25	-10.89	-11.71	-13.75
Urals FOB Primorsk	77.39	67.07	59.63	-10.33	-7.44	-13.73	-15.99	-18.22
Urals FOB Novorossiysk	78.77	68.80	59.65	-9.97	-9.16	-12.35	-14.25	-18.20
ESPO FOB Kozmino	84.29	78.06	72.21	-6.23	-5.85	-6.83	-4.99	-5.64
						Discounts to Dubai M1		
ESPO FOB Kozmino						-5.13	-5.44	-5.11

ESPO FOB Kozmino

Sources: Argus Media Group, Kpler . Russia Weighted Average for Urals from Baltic and Black Sea, Siberian Light and Espo.

All Russian product export prices fell in December, in line with the general international oil price trend. Moreover, they all remained below the price cap, except for naphtha. Russian product cracks versus Urals Baltic benefitted from the deterioration in the crude price discount to North Sea Dated, strengthening by around \$1.70/bbl versus those for the international market. Nevertheless, they roughly tracked trends in international cracks in December, as those for middle distillates declined while naphtha, gasoline, VGO and fuel oil increased. The latter two remain in high demand as OPEC production cuts reduce the volume of available heavier crude grades and new complex refineries in the Middle East eat into feedstock availability.

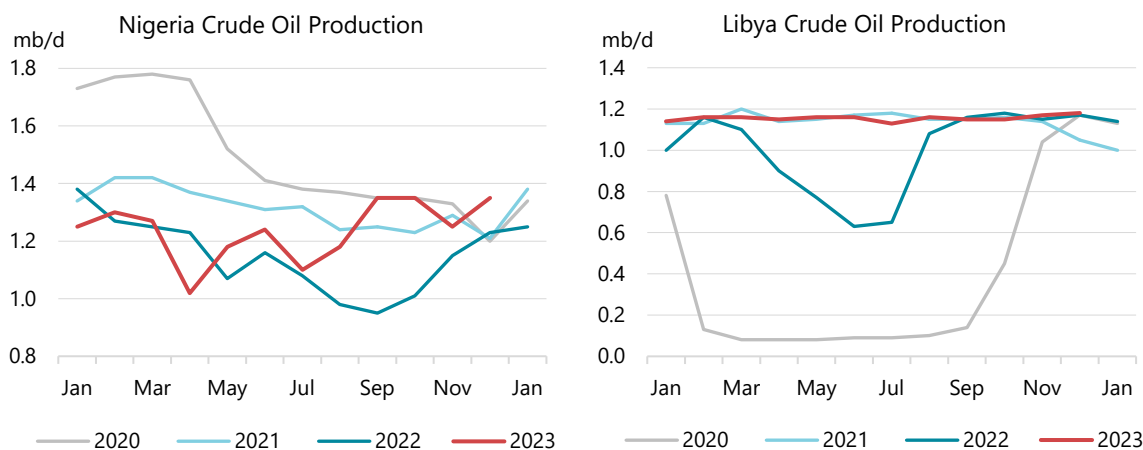
	Russian FOB Export Prices (\$/bbl)						Russian FOB Export Prices (\$/bbl)				
	Oct-23	Nov-23	Dec-23	Oct - Nov	Nov - Dec		Oct-23	Nov-23	Dec-23	Oct - Nov	Nov - Dec
Premium Products						Discounted Products					
Price Cap	100.00	100.00	100.00			Price Cap	45.00	45.00	45.00		
Gasoline	74.92	72.37	68.95	-2.55	-3.42	Naphtha	51.76	49.29	48.40	-2.47	-0.89
Diesel	106.49	96.30	87.83	-10.19	-8.47	Fuel Oil	51.20	43.48	38.27	-7.72	-5.21
Gasoil	99.11	87.67	79.07	-11.44	-8.60	Sources: Argus Media Group, Kpler.					
VGO	68.37	58.68	54.01	-9.70	-4.67	Note: Weighted avg prices from Baltic and Black Sea ports.					

While estimated export revenues fell by over 9% m-o-m in December, the Russian government's fiscal revenues from oil fell 19% m-o-m, to \$9.8 bn (+15% versus December 2022), according to Russia's Finance Ministry. The apparent disconnect reflects price and volume trends for Russian crude and products with a one- to two-month lag. Export duty payments fell 15% m-o-m to \$0.5 billion, in-line with lower FOB export prices. Mineral Extraction Taxes (MET) revenues fell 19.5% m-o-m to \$9.4 billion. Government fiscal revenues from oil in US dollars fell 29% y-o-y to \$100 billion for 2023 as a whole and were 7% below their 2019 level despite a North Sea Dated crude price that was 29% higher. While MET revenues rose 14.6%, revenues from export duties fell by 80%. Government fiscal revenues from natural gas in US dollars fell 60% y-o-y to \$21 billion for the year but were 3% above their 2019 level. Combined oil and gas fiscal revenues fell 37% y-o-y to \$121 billion and were 5.5% below their 2019 level.

Kazakh crude oil supply increased by 30 kb/d to 1.6 mb/d in December as exports rebounded from loading disruptions. Its crude oil output rose 95 kb/d in 2023 to 1.6 mb/d, led by higher flows from the Kashagan oil field. **Azeri** crude oil output dipped to 480 kb/d last month. In 2023, crude oil output

declined by 55 kb/d to an average 500 kb/d. In recent weeks, BP started drilling at the new Azeri Central East (ACE) platform in the offshore Azeri-Chirag-Guneshli (ACG) contract area and expects first oil early this year. The \$6 bn ACE project is due to pump 100 kb/d, helping to compensate for declines elsewhere in the ACG area.

Combined output from African members of OPEC+ rose 100 kb/d in December. Output in **Nigeria** climbed 100 kb/d to 1.35 mb/d along with sharply higher exports. Its average crude oil production rose 90 kb/d in 2023 to 1.24 mb/d. In January, Shell announced it plans to divest its onshore Nigerian assets. Output in **Algeria** eased to 950 kb/d.



Libyan crude oil production inched up to 1.18 mb/d. Relative stability throughout 2023 allowed the country's crude output to rise 160 kb/d to an average 1.16 mb/d. But this year kicked off with Libya's National Oil Corp on 7 January declaring *force majeure* with immediate effect at its Sharara oilfield, which can pump up to 300 kb/d, due to protests in the area. The North African producer's oil fields and terminals are often targeted by political factions or militants.

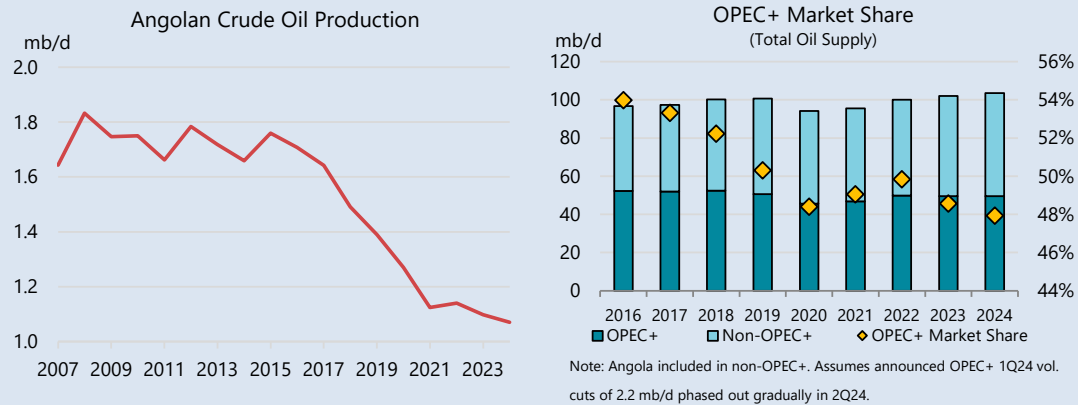
Supply in **Venezuela** held steady at 800 kb/d. Production was up for a third straight year in 2023, rising by 70 kb/d to 770 kb/d thanks mostly to Chevron's return after Washington granted it a license that enabled the US company to restart operations. Annual average output this year is expected to top the 800 kb/d mark. Last October, the United States announced it was easing sanctions on Venezuela's energy sector for six months in response to a 2024 election deal reached between Caracas and the country's opposition. We do not foresee substantial short-term upside as capacity is currently constrained by long overdue maintenance and only modest operational improvements.

Angola quits OPEC after 2024 quota dispute

Angola left OPEC effective 1 January 2024, saying its role in the organisation was "not relevant". The departure of the West African producer came after it publicly rejected the bloc's decision to revise down its 2024 production ceiling to 1.11 mb/d from 1.28 mb/d that was previously set in June. In December, its final month in OPEC, Angola pumped 1.12 mb/d of crude oil, up 40 kb/d m-o-m.

The impact on world oil markets has been negligible. Output in Angola has been on a downward trend for years due to underperforming assets and operational setbacks. Angola's exit drops OPEC membership to 12 and the ranks of OPEC+ to 22. It also shrinks the group's market share to 48% this year, the lowest since the alliance was created seven years ago.

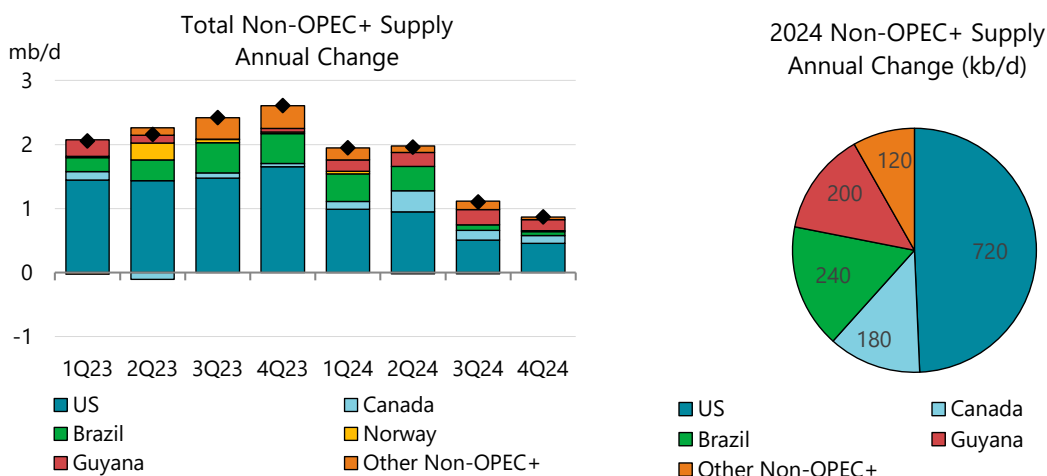
When it joined OPEC in 2007, Angola produced 1.6 mb/d of crude oil. Output plateaued at 1.7-1.8 mb/d from 2008 to 2016 before starting on a decline aggravated by operational issues. In a bid to reverse the decline, Luanda in 2018 introduced new fiscal incentives to encourage companies to explore and develop existing assets, including marginal fields. While this and several amendments in its fiscal terms have helped to stem the decline, they have failed to provide any major boost to production.



Angola is not the first country to leave OPEC in recent years. Indonesia quit in 2016, followed by Qatar in 2019 and Ecuador in 2020.

Non-OPEC+

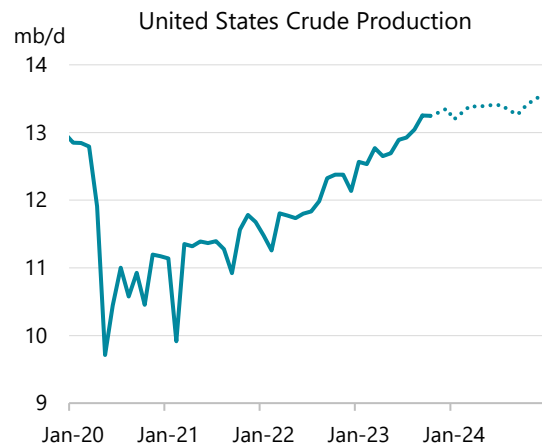
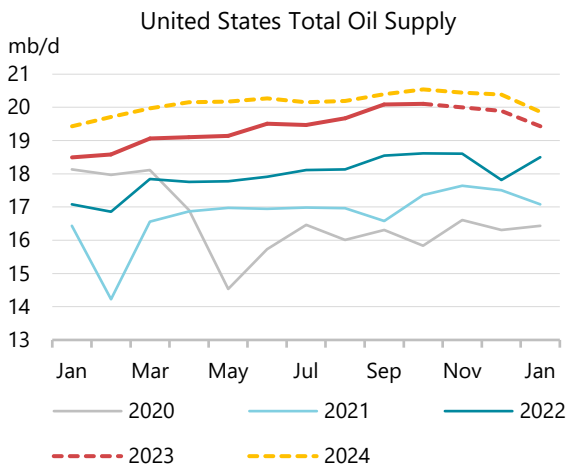
The last quarter of 2023 saw the United States, Brazil, Canada and Guyana all produce at record levels. These four countries accounted for 88% of the 2.3 mb/d of non-OPEC+ supply growth in 2023. Along with substantial gains in Chinese output, they helped push non-OPEC+ production up by 2.6 mb/d y-o-y to 52.4 mb/d in 4Q23, 610 kb/d higher than previously forecast. For this year, the same quartet is set to break records again and contribute 91% of the 1.5 mb/d total growth that lifts of non-OPEC+ production to 52.8 mb/d.



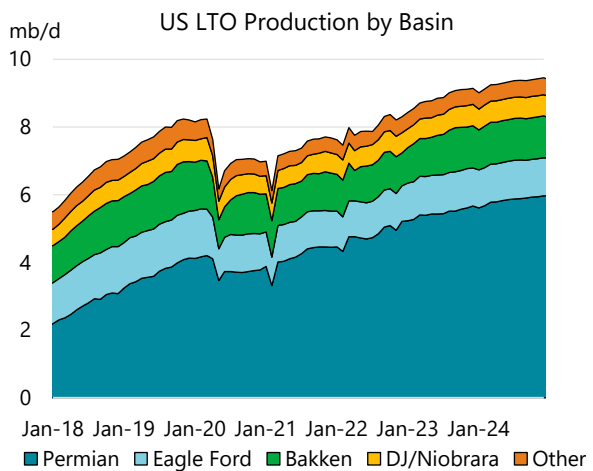
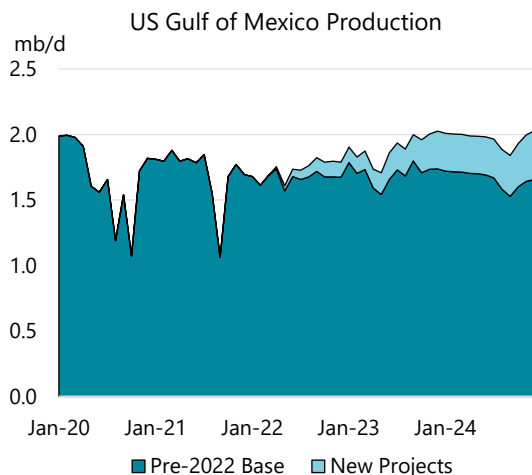
In October, the last month for which official data from the Energy Information Administration (EIA) is available, total **US** oil supply inched higher by 20 kb/d to 20.1 mb/d as NGLs just bested their

previous high of 6.8 mb/d set in September, while crude remained flat at 13.2 mb/d. Monthly gains in crude oil production from Alaska, Colorado, New Mexico, Texas and West Virginia were offset by losses in North Dakota and the Gulf of Mexico (GoM). US oil supply in November and December is estimated to have eased marginally on weaker NGL production, amid lower ethane prices vis-à-vis natural gas prices. NGL supply has nevertheless been revised up by 190 kb/d for 4Q23 and 100 kb/d in 2024 based on the recent strong performance (see *US NGLs continue unrelenting growth pace in 2024*).

For 2023 as a whole, US total oil supply increased by 1.5 mb/d, of which crude oil accounted for 1 mb/d and NGLs 480 kb/d. An additional 440 kb/d of crude gains and 290 kb/d of NGLs growth is expected for 2024, bringing total US supply to 20.2 mb/d, with crude oil set to average 13.4 mb/d and NGLs 6.7 mb/d.

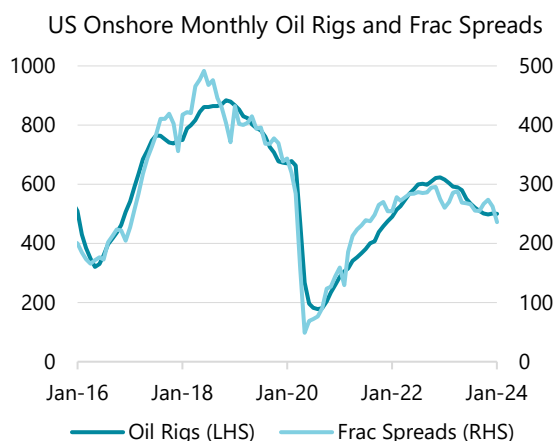


Light tight oil (LTO) will continue to dominate US crude supply growth in 2024, with smaller gains from the Gulf of Mexico. GoM output is expected to increase by 70 kb/d to 2 mb/d as Chevron's 75 kb/d Anchor project, Shell's 80 kb/d Whale project and Beacon's 60 kb/d Shenandoah start up in the second, third and fourth quarter, respectively. Additionally, infill wells at Appomattox, Heidelberg and Tubular Bells will help offset base declines. While oil operations escaped any hurricane impacts in 2023, our forecast for 2024 assumes a loss of 11 mb, concentrated in 2H24 (60 kb/d average impact over the second half of the year), in line with historical trends.

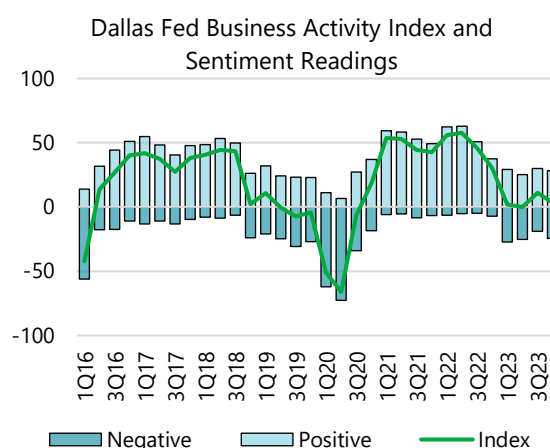


Light tight oil production growth is expected to halve from 890 kb/d in 2023 to 440 kb/d this year as the effects of lower activity levels and reduced inventory of drilled but uncompleted wells (DUC) are

felt throughout key basins. Drilling activity appear to have stabilised in the US shale patch during 4Q23 with roughly 500 oil rigs running, down 20% from 4Q22 highs, according to *Baker Hughes Rig Count* data. *Primary Vision* data showed frac spreads fell from end-November through mid-January by 45 to 236, following historical patterns due to budget exhaustion and holiday scheduling. We expect those crews to be picked back up by mid-1Q24 and for frac spreads to average around the same number in 2024 as last year.



Sources: Primary Vision, Baker Hughes.



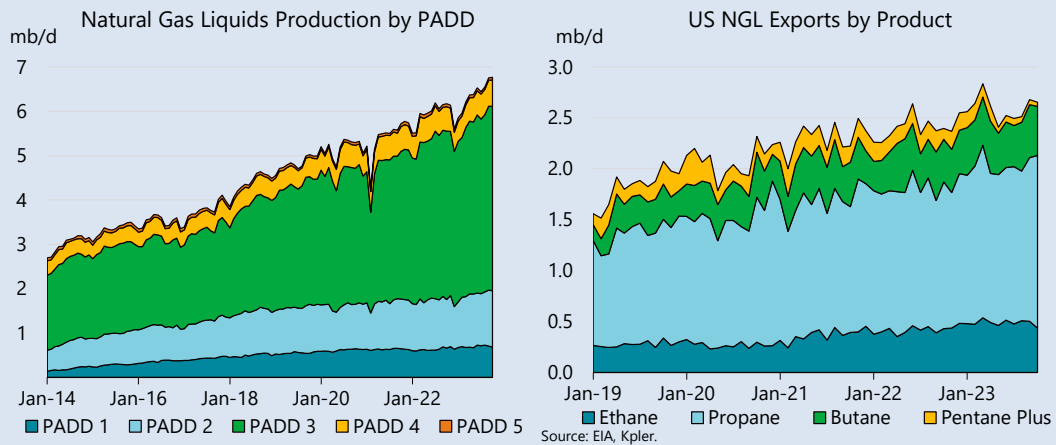
Source: Dallas Federal Reserve Bank

Results of the fourth quarter Dallas Fed Energy Survey reiterated the challenges and uncertainty in the shale patch. The quarterly survey of 144 energy firms (96 producers and 48 oilfield service companies) showed that business activity and sentiment remained low. Additionally, small producers (less than 10 kb/d of production) stated their priority in the coming year was to maintain or grow production while larger producers responded that their goals were to acquire assets and reduce debt. Three-quarters of the survey respondents thought more large acquisitions would be announced in the coming two years.

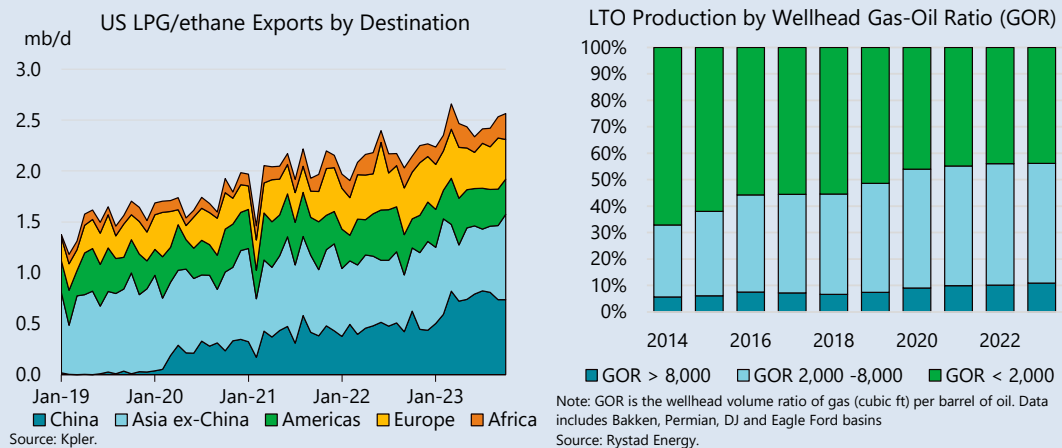
US NGLs continue unrelenting growth pace in 2024

While US demand for ethane and propane has grown quite considerably over the last decade, it has been outpaced by the unrelenting expansion in supply. NGL production growth averaged 9% per year over the 2014-22 period and 8% in 2023 to an annual average of 6.2 mb/d. If one were to consider US NGL supply as its own country, it would rank as the 4th largest producer in the world on a volumetric basis.

US NGL supply in 2023 was made up of 41% ethane, 31% propane, 16% butane and 12% pentanes. Growth has been driven primarily by associated gas production in the Permian basin, with the Gulf Coast PADD 3 region accounting for 77% of total US ethane growth last year and close to 60% of production increases since 2014. PADD 1, which includes most of the Marcellus shale play, makes up 25% of the last decade's ethane gains while PADD 2, which includes the Bakken basin and the western flank of the Marcellus, accounts for the remainder. Propane volumes show almost identical trends but with PADD 3 accounting for 70% of 2023's growth and closer to 50% of those in the last decade. PADD 4 makes up the other 10%.



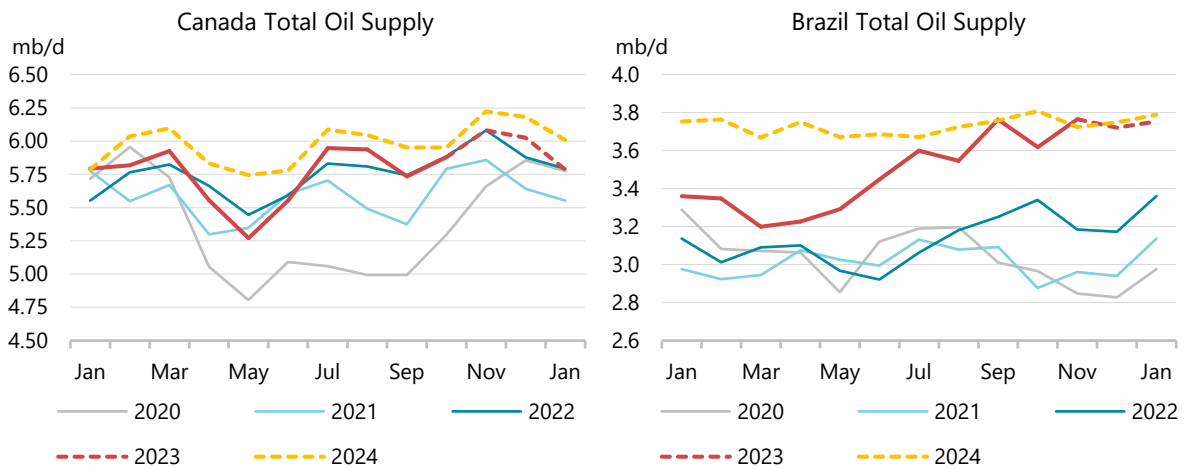
In addition to a growing US petrochemical industry, the country’s exports of ethane and LPG have increased by 930 kb/d since 2019, according to *Kpler* data, with close to three-quarters being directed to China. Chinese imports of US NGLs rose from practically nothing to 670 kb/d over the same period, with US exports squeezing out 120 kb/d of Middle Eastern feedstocks. Between feedstock and ethylene derivative imports, China has taken the equivalent of 820 kb/d of incremental US NGL supply since 2019 – accounting for just over half of the 1.6 mb/d of output growth (see web commentary [China’s petrochemical surge is driving global oil demand growth](#)).



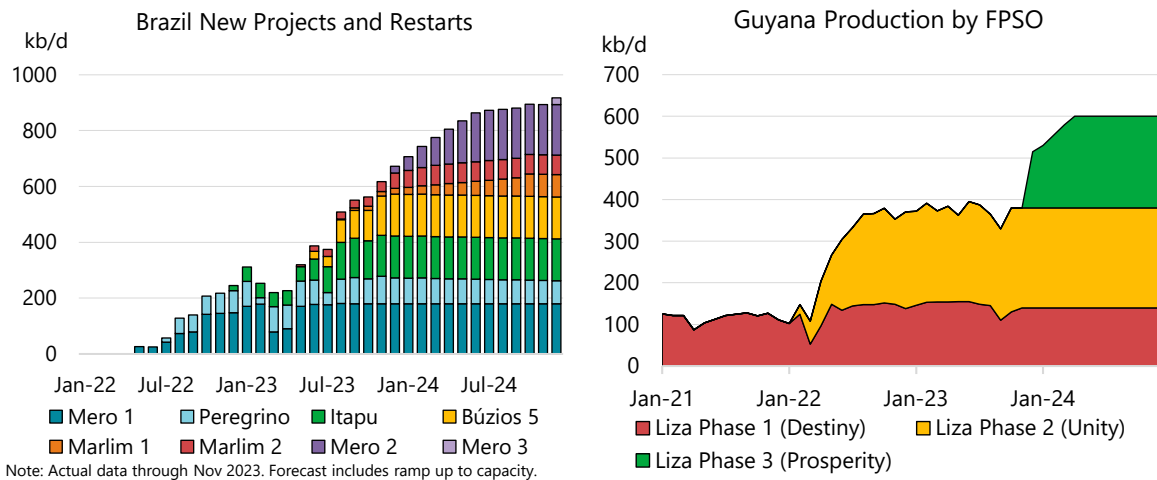
Out of the 480 kb/d of NGL gains in 2023, 220 kb/d or just under half was ethane, with another 25% of the increase being propane, similar to historical data. This year sees ethane and propane making up 75% of the 290 kb/d rise in output. While decelerating, NGL growth isn’t forecast to slow as sharply as US LTO growth as gas-oil ratios (GOR) have been increasing across key shale basins, due to reservoir dynamics and new drilling location quality.

Canadian supply rose by a further 200 kb/d m-o-m in November, matching the previous high of 6.1 mb/d, after October data was revised upwards by 150 kb/d, based on government data. December production came off November’s high by 60 kb/d, primarily on lower estimated bitumen output. The fourth quarter saw Canadian production rise 120 kb/d q-o-q. Suncor had their second-best quarter ever, producing more than 760 kb/d from Canada and successfully restarting the Terra Nova offshore Atlantic project. For the year as a whole, Canadian oil supply was up 40 kb/d, with another 180 kb/d of growth forecast for 2024, taking annual output to an all-time high

of 6 mb/d. The Trans Mountain Expansion Project (TMX), that is expected to begin commercial operations in 2Q24, will provide improved egress for Albertan crude and accommodate the next phase of expansions and debottlenecking in the province.



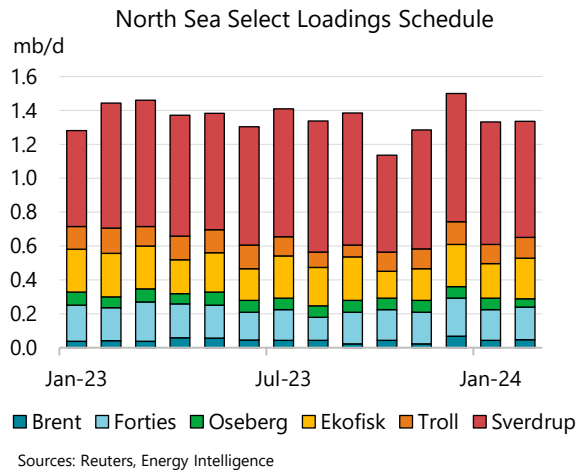
Brazilian output fell by 40 kb/d m-o-m in December, to 3.7 mb/d based on provisional daily data from the Agencia Nacional do Petroleo (ANP). This came after official November ANP data showed supply hit a new record high of 3.8 mb/d, the third new peak reached during 2023. Gains have been driven by operational efficiency, field reliability improvements and seven new floating production storage and offloading vessels (FPSO) brought online since the start of 2022, including the start-up of the 180 kb/d Mero 2 (FPSO Sepetiba) in December. Annual supply increased by 370 kb/d in 2023 to 3.5 mb/d and is forecast to grow by another 240 kb/d in 2024 to reach 3.7 mb/d.



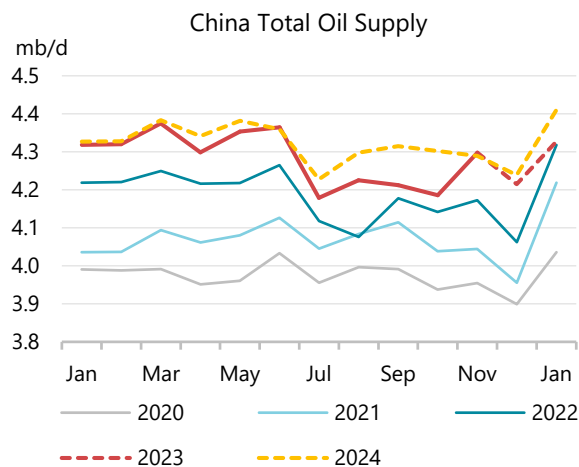
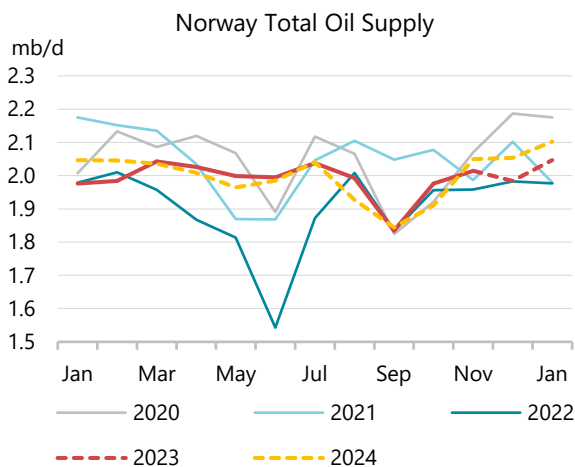
Elsewhere in Latin America, early December saw the first cargoes from the start-up of **Guyana's** Prosperity FPSO (Payara Gold). The ramp up of the project has exceeded expectations thus far, with *Kpler* data showing four cargoes totalling 140 kb/d having set sail in the first month of operations. We expect the FPSO to continue to ramp up towards its full 220 kb/d capacity by the end of the first quarter, bringing Guyana's total output for the year to 590 kb/d. **Argentinian** supply was flat on the month in December at 800 kb/d as growth in LTO offset underlying field declines in conventional production. Growth in 2024 is forecast to average 50 kb/d, the same as in 2023. With total oil output set to reach 810 kb/d this year, Argentina will surpass Colombia to become the continent's third largest producer after Brazil and Venezuela.

North Sea loadings (as measured by BFOE plus Troll and Johan Sverdrup) are scheduled at 1.34 mb/d in February, flat on the month and down 110 kb/d from the year prior with Johan Sverdrup and Troll making up most of the difference. Annually, Johan Sverdrup loadings were up 200 kb/d in 2023, its first full year of Phase 2 operations.

UK production fell by 30 kb/d in December to 710 kb/d, down 80 kb/d from a year ago. Reduced investment in the UK offshore sector has led to steady declines since 2019, and 2024 is no exception with supply forecast to fall by another 50 kb/d to 680 kb/d as new projects mitigate underlying base field declines.



Data from the **Norwegian** Offshore Directorate (SODIR, formerly the Norwegian Petroleum Directorate) show production in November rose by 40 kb/d to 2 mb/d, while December supply is estimated to have fallen by 30 kb/d. Annual output increased by 90 kb/d to 2 mb/d in 2023 and is expected to be relatively flat in 2024. SODIR released their annual retrospective report, [The Shelf in 2023](#), in which they noted 92 fields are currently producing in Norway with five having shut down over the year and four new fields having come online (Bauge, Bredablikk, Fenja and Tommeliten A). Additionally, 34 exploration wells were drilled over the year with 14 discoveries made.

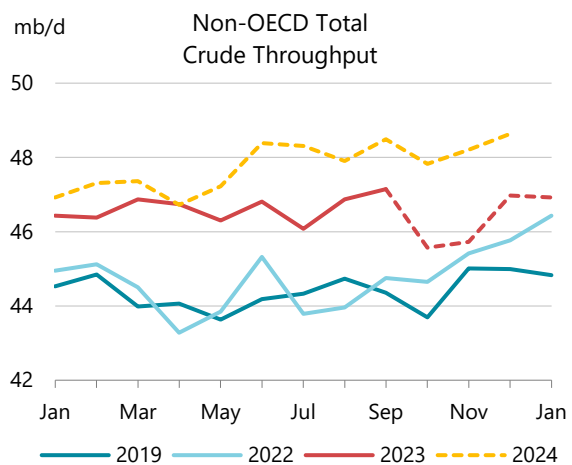
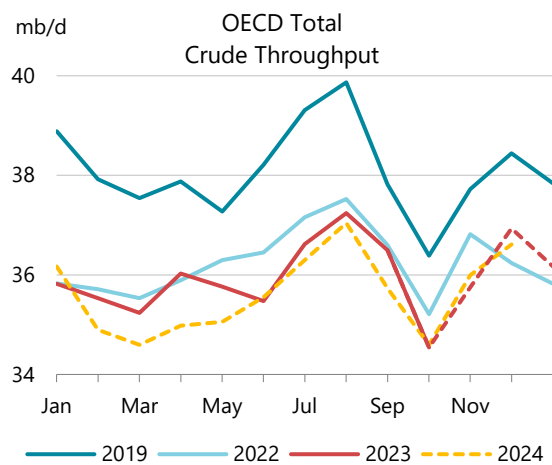


Chinese crude production rose by 110 kb/d m-o-m in November to 4.1 mb/d, bringing total oil supply to 4.3 mb/d on the month. Official Chinese data showed offshore South China Sea production, boosted by the Chinese National Offshore Oil Company's (CNOOC) Lufeng phase 2 project, to be exceptionally strong. Furthermore, December volumes followed seasonal trends and declined by 80 kb/d. For 2023 as a whole, Chinese oil production rose by 100 kb/d, with offshore fields accounting for close to 60% of the increase. Production growth is expected to slow to just 40 kb/d this year as fewer new fields come online to offset natural decline.

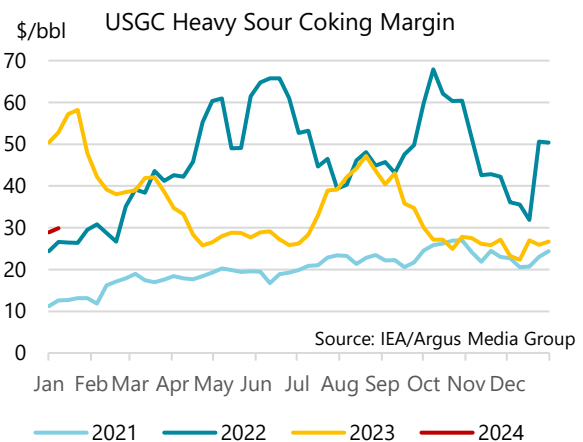
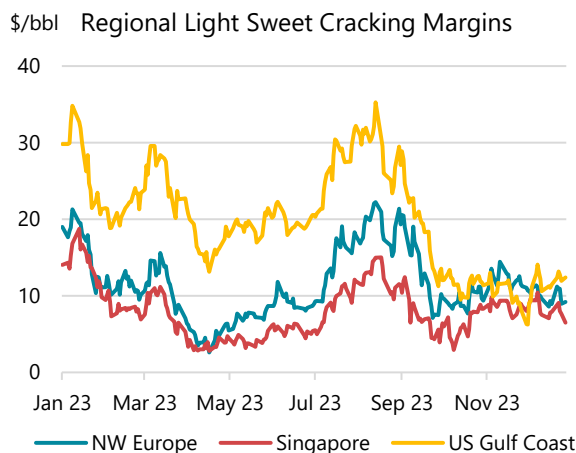
Refining

Overview

Refinery crude throughput rates are forecast to average a record high of 83.3 mb/d this year, outpacing 2023 and overtaking 2018's previous peak level. The disparity between OECD and non-OECD processing will widen further, with new refineries expected to start-up in Nigeria and China, the expansion of existing facilities in Bahrain and India, and the ramp-up of activity at refineries in Oman and Kuwait. Conversely, OECD refining capacity and processing rates continue to shrink, with closures expected in all three OECD regions over the next 12-24 months.



Refining margins, though still relatively healthy, weakened again in the Atlantic Basin during December. The US Gulf Coast (USGC) surrendered more of last summer's outperformance, as rising product inventory cover eased market tightness. By contrast, Singapore margins strengthened, as Asian crude availability improved. The disparity between regional refining profitability narrowed substantially over 4Q23, with December's average light sweet cracking margins in Europe, Singapore and the USGC all within a \$2.50/bbl range, compared with \$17/bbl spread seen in 3Q23. USGC coking margins remain the most profitable amongst key refining hubs.



Source: IEA/Argus Media Group

Regional refining developments

Global refinery throughputs reached a seasonal peak in December at 83.8 mb/d, according to preliminary data. Chinese runs remained weak last month, constrained by a combination of slower domestic demand and exhausted crude import and product export quotas. Global crude runs in 2023 are estimated to have averaged 82.3 mb/d, just shy of the 2018 record level of 82.5 mb/d. We expect this year's increase of 950 kb/d to lift global processing rates to a new all-time high of 83.3 mb/d as the 1.3 mb/d increase in non-OECD runs offsets weaker OECD throughputs.

Global Refinery Crude Throughput ¹														
(million barrels per day)														
	2019	2020	2021	2022	3Q23	Nov-23	Dec-23	4Q23	Jan-24	Feb-24	Mar-24	1Q24	2023	2024
Americas	19.1	16.6	17.7	18.7	19.3	18.4	19.2	18.4	18.6	17.8	18.0	18.1	18.7	18.5
Europe	12.2	10.7	11.0	11.5	11.7	11.4	11.6	11.4	11.4	11.0	10.8	11.1	11.4	11.3
Asia Oceania	6.8	5.9	5.8	6.1	5.7	6.0	6.1	6.0	6.1	6.1	5.9	6.0	5.9	5.8
Total OECD	38.1	33.1	34.5	36.3	36.8	35.8	36.9	35.7	36.2	34.9	34.6	35.2	36.0	35.6
FSU	6.9	6.5	6.8	6.5	6.6	6.6	6.8	6.6	6.6	6.8	6.6	6.6	6.6	6.6
Non-OECD Europe	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.4
China	13.4	13.7	14.4	13.7	15.4	14.7	14.8	14.9	15.2	15.4	15.6	15.4	15.0	15.4
Other Asia	10.4	9.3	9.7	10.2	10.1	10.5	10.6	10.4	10.8	10.7	10.5	10.7	10.5	10.7
Latin America	3.2	3.0	3.3	3.5	3.6	3.6	3.6	3.6	3.5	3.5	3.4	3.5	3.6	3.5
Middle East	7.9	7.1	7.8	8.3	8.7	8.2	8.9	8.4	8.6	8.7	9.1	8.8	8.5	9.2
Africa	2.0	1.9	1.8	1.8	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.6	1.9
Total Non-OECD	44.3	41.9	44.1	44.5	46.6	45.6	46.9	46.0	46.8	47.2	47.3	47.1	46.4	47.7
Total	82.4	75.0	78.6	80.8	83.4	81.4	83.8	81.7	83.0	82.1	81.9	82.3	82.3	83.3
<i>Year-on-year change</i>	<i>-0.1</i>	<i>-7.3</i>	<i>3.6</i>	<i>2.2</i>	2.2	-0.8	1.9	0.5	0.8	0.3	-0.1	0.3	1.6	0.9

¹ Preliminary and estimated runs based on capacity, known outages, economic runcuts and global demand forecast.

In the short term, demand for crude is expected to ease as seasonal maintenance activity builds, initially in North America and the Middle East, followed by Europe later in 1Q24. Crude runs are forecast to dip to 81.9 mb/d by March, nearly 2 mb/d below December's peak. Thereafter, the ramp up of crude runs at newly-commissioned capacity in Nigeria and China will boost global throughputs over the course of the year to 83.9 mb/d by 4Q24.

This month's assessment for 2023 crude runs of 82.3 mb/d is 70 kb/d lower than last month's *Report*. Revisions are concentrated in 4Q23 which was downgraded by 160 kb/d. With incorporation of preliminary data from the OECD and key non-OECD countries (e.g. China, India, Russia and Brazil), November's crude runs estimate is 140 kb/d lower than last month. Canada and Europe account for almost all the net reduction. December estimates are trimmed by 380 kb/d, largely due to continued weak Chinese activity levels. Elsewhere in 2023, another notable change included a 50 kb/d downgrade to Pakistan's crude throughput assessment, which is partly carried through into 2024.

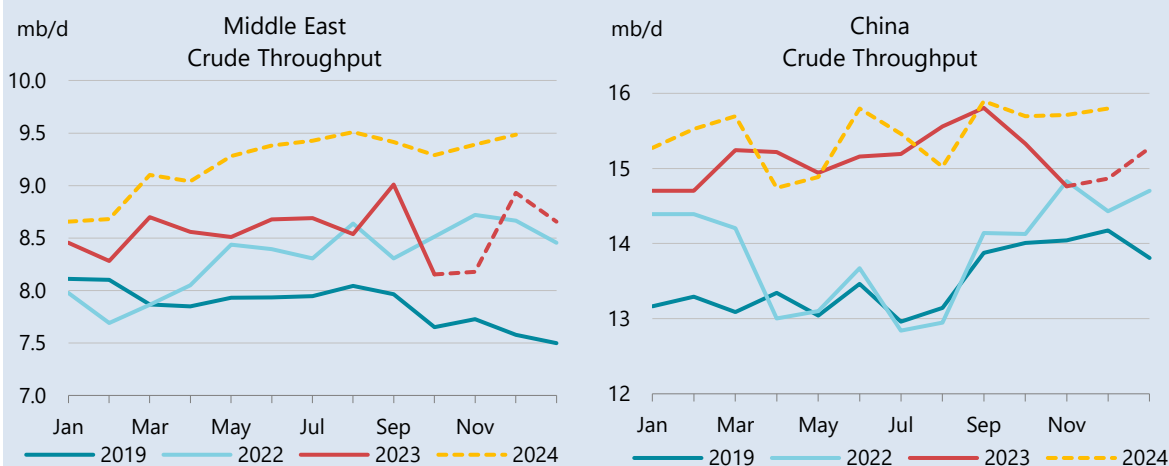
Global refined product demand growth of 1.24 mb/d this year tethers our expectation for growth in crude runs in 2024 to 950 kb/d. From a market balance perspective, we assume that the 300 kb/d of LPG demand growth is effectively supplied by continued strong US NGL supply gains. Nevertheless, we expect higher fuel consumption in Asia and the Middle East to support an increased call on refinery output.

The start-up of several world class refineries will pressure exports from existing and less competitive sites. European refiners will contend with reduced demand for their gasoline exports once Nigeria's 650 kb/d Dangote refinery is running at a steady state, which we assume will occur in 2H24. Similarly, commercial start-up of Pemex's Dos Bocas refinery, (we currently expect it in 2025) will

pressure USGC refiners for which Mexico is the largest gasoline export market. Consequently, US and European refiners will need to find new markets for their cargoes.

The Middle East, China and Africa set to lead crude throughput growth in 2024

China's dominance in global refinery activity growth will ease in 2024. The Middle East is expected to lead the gains in crude runs, with an increase of 650 kb/d. This assumes continued improvement in runs at Kuwait's 615 kb/d Al Zour refinery and Saudi Arabia's 400 kb/d Jizan plant, as well as Oman's 230 kb/d Duqm refinery operating at full capacity and the 110 kb/d expansion of Bahrain's Sitra refinery coming onstream.



For 2024, Chinese crude runs are forecast to increase by 330 kb/d y-o-y, with commercial operations at the 400 kb/d Yulong refinery now expected in 2H24. Beyond the overall level of Chinese demand growth, a key downside risks to the country's runs forecast comes from the level of crude import and product export quotas allocated by the government. The first batch of export quotas for 2024 was issued in December by the Ministry of Commerce for a total of 154 mb (equivalent to 840 kb/d for 1H24), broadly unchanged from last year's initial quota. If further quota allocations are limited, this could restrict runs later in the year, as was evident in 4Q23.

The third largest source of growth for this year is Africa at +220 kb/d. This increase rests largely on reports that Nigeria's Dangote refinery has started processing crude. Tanker tracking data points to 5.3 mb of Nigerian crude having been delivered to Dangote's offshore single point mooring buoy since the start of December, presumably for commissioning purposes. While these initial supplies of crude are necessary to commence test-runs, we assume that steady state commercial operations will start in early 2Q24. Last year, Oman's Duqm refinery received its first crude cargoes more than six months before commercial operations started. Reports that Nigeria's 210 kb/d Port Harcourt refinery is nearing the completion of its multi-year refurbishment project could further boost refinery demand for crude. For now, we view this as more likely in 2025, rather than this year. Elsewhere in Africa, we assume a 60 kb/d increase in Egyptian runs, towards 2022's level, after the poor performance of last year.

OECD throughputs are forecast to contract by 320 kb/d in 2024, with capacity closures in the United States and Japan weighing on activity levels. Upside risks to our OECD runs forecast remain, as the permanent closure of refining capacity is often delayed when margins remain healthy. The often-preferred option of converting refining assets to produce biofuels, either completely or on a co-processing basis as a strategy to boost low-carbon fuels, allows operators flexibility in timing the

closure. An alternative route for producing a low-carbon fuels is to convert refineries to produce e-fuels (see *Will e-fuels challenge conventional refineries in mature markets?*)

OECD crude runs averaged 35.8 mb/d in November, as lower seasonal maintenance in the United States, Canada and Japan all contributed towards the 1.2 mb/d m-o-m gain. OECD Americas drove much of the increase, rising 790 kb/d m-o-m, to 18.4 mb/d, as a heavy turnaround season neared completion. Gains in the United States, Mexico and Canada ranged from 200-390 kb/d. European runs increased by 185 kb/d overall to 11.4 mb/d, with gains in Germany, the United Kingdom and Sweden, outpacing the drop in the Netherlands. Crude runs in OECD Asia Oceania increased 230 kb/d on the month, to 6 mb/d, with Korean runs reaching a six-month high of 2.85 mb/d. The rebound nevertheless left OECD crude runs down 1.1 mb/d on a year ago, with US crude runs a substantial 700 kb/d lower y-o-y. The longer-than-normal US autumn 2023 maintenance season accounts for the shortfall. US crude runs improved over the course of December to reach a peak at 16.7 mb/d at the end of the year.

Refinery Crude Throughput and Utilisation in OECD Countries

(million barrels per day)

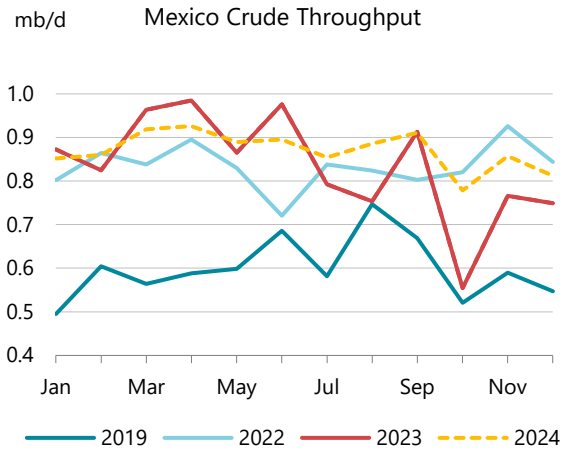
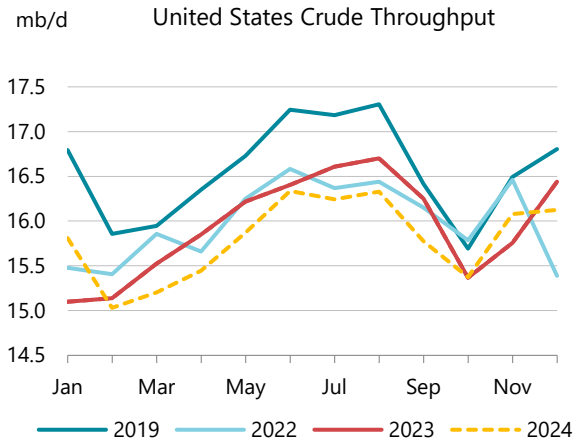
	Jun 23	Jul 23	Aug 23	Sep 23	Oct 23	Nov 23	Change from		Utilisation rate	
							Oct 23	Nov 22	Nov 23	Nov 22
US ¹	16.39	16.60	16.69	16.24	15.36	15.75	0.39	-0.71	88%	93%
Canada	1.81	1.85	1.85	1.74	1.51	1.72	0.20	-0.08	94%	99%
Chile	0.14	0.19	0.19	0.20	0.19	0.18	-0.01	0.02	80%	69%
Mexico	0.97	0.78	0.74	0.90	0.54	0.76	0.21	-0.16	47%	56%
OECD Americas¹	19.32	19.42	19.47	19.07	17.61	18.40	0.79	-0.92	85%	90%
France	0.99	1.04	1.08	1.05	0.95	0.96	0.01	0.07	79%	73%
Germany	1.68	1.71	1.72	1.59	1.51	1.62	0.11	-0.28	79%	93%
Italy	1.18	1.22	1.32	1.43	1.39	1.29	-0.10	0.02	74%	73%
Netherlands	0.98	0.98	1.12	1.09	1.15	1.17	0.03	0.24	94%	75%
Spain	1.17	1.29	1.27	1.31	1.21	1.24	0.03	0.06	84%	80%
United Kingdom	0.94	1.00	0.99	0.90	0.78	0.87	0.09	-0.12	73%	83%
Other OECD Europe ²	4.08	4.33	4.44	4.28	4.18	4.20	0.02	-0.07	87%	88%
OECD Europe	11.03	11.58	11.93	11.65	11.17	11.36	0.19	-0.07	83%	83%
Japan	2.18	2.39	2.75	2.49	2.44	2.60	0.16	-0.14	81%	82%
Korea	2.43	2.69	2.57	2.70	2.80	2.85	0.05	0.05	80%	78%
Other Asia Oceania ³	0.51	0.53	0.52	0.57	0.53	0.55	0.02	0.00	101%	100%
OECD Asia Oceania	5.13	5.61	5.84	5.76	5.76	6.00	0.23	-0.08	82%	82%
OECD Total	35.47	36.61	37.24	36.49	34.54	35.75	1.21	-1.06	84%	87%

¹ US includes US50, OECD Americas include Chile and US territories

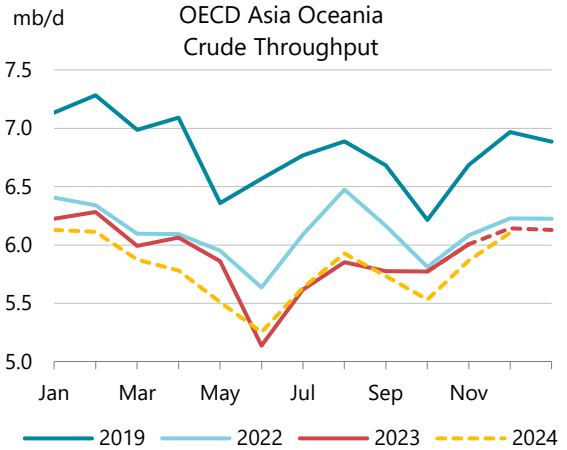
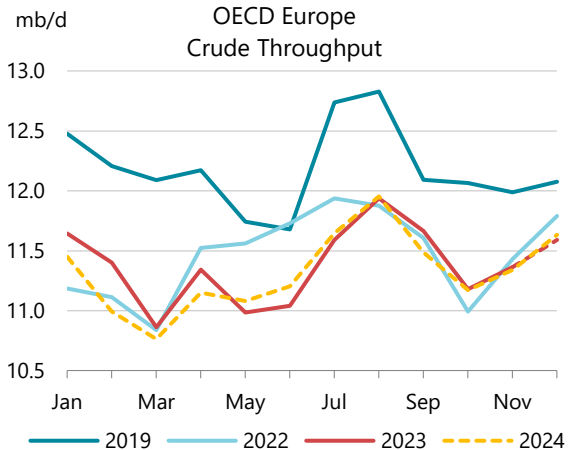
² Includes Lithuania

³ Includes Israel

OECD Americas runs are forecast to average 18.5 mb/d in 2024, a decline of 150 kb/d y-o-y. In the short term, runs are expected to dip as the spring maintenance season kicks off. Furthermore, the very cold weather currently sweeping across much of the United States is assumed to curb January runs by 200 kb/d. For now, we have not incorporated a repeat of the early 2021 extreme cold-weather snap that cut runs by nearly 5 mb/d over a two-week period into our forecast although this remains a possibility. Upside risks to the outlook centre on Pemex's target of raising Mexican crude runs to 1.5 mb/d this year. We currently assume a small y-o-y improvement in Mexican refinery throughputs over the course of the year, with more substantial improvements possible pending the successful commissioning of the Dos Bocas refinery.



OECD Europe refinery throughputs rebounded by 185 kb/d m-o-m to 11.4 mb/d in November, and were only 65 kb/d lower y-o-y. Regional runs are forecast to average 11.3 mb/d in 2024, a decline of 60 kb/d y-o-y. Europe’s structural bias towards middle distillate production provides strong support to processing levels within the current margin environment that has middle distillate cracks at a hefty premium to other clean products. Conversely, the region’s production of naphtha for petrochemical operations is a source of concern, given weak petrochemical operating rates and feedstock demand. Heavily integrated refineries could see further reductions in output if low petrochemical production morphs into capacity closures. Petroineos will shut its 150 kb/d Grangemouth refinery by 2025. Other refineries, including the 84 kb/d Livorno refinery in Italy, remain at risk of being shuttered, or conversion to a bio-fuels refinery, but arguably not within this *Report’s* forecast period.



OECD Asia Oceanian runs increased by 230 kb/d in November to 6 mb/d, as seasonal maintenance unwound. Japanese crude processing rose by 160 kb/d m-o-m to 2.6 mb/d ahead of stronger winter demand for heating fuels. We expect throughputs to have reached a peak of 2.7 mb/d in December and January, before tailing off seasonally in February. Korean crude runs reached an eight-month high of 2.85 mb/d (+50 kb/d m-o-m) amidst the tail-end of planned maintenance work. We expect Korean refinery activity to have increased further into year-end and have raised our 2024 forecast by 30 kb/d following the better-than-expected performance in the face of weak petrochemical margins. Nevertheless, average 2024 OECD Asia Oceania crude throughputs are expected to contract by 100 kb/d y-o-y to 5.8 mb/d, largely due to lower processing rates in Japan if the planned closure of Idemitsu’s 120 kb/d Yamaguchi plant in March goes ahead.

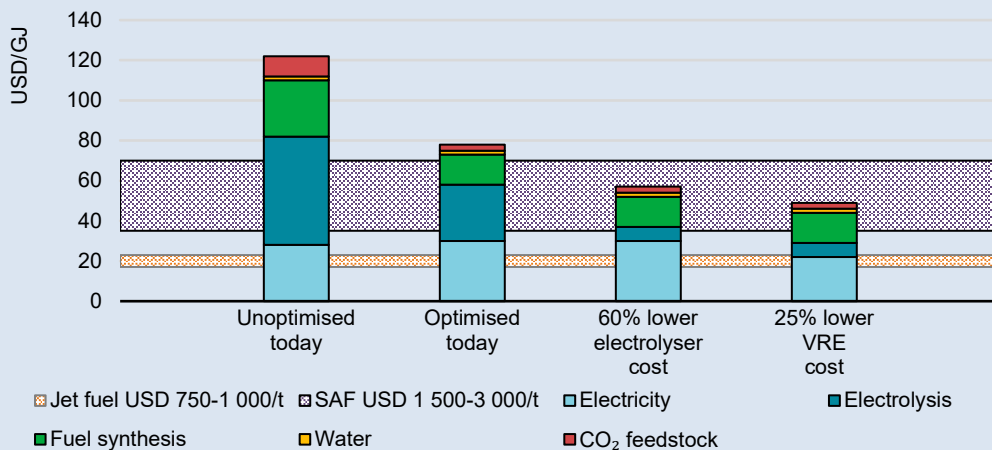
Will e-fuels challenge conventional refineries in mature markets?

Refineries that face declining fuel demand, increased maintenance spend, ageing infrastructure and higher operating costs are being converted, either partially or wholly, to bio-refineries. This trend has seen more than 50 refineries shift their focus to the production of low-carbon fuels, predominantly across Europe, Japan and the United States, with a cumulative output of 150 kb/d. In addition to production of bio-fuels, refinery operators are increasingly exploring the potential to switch towards fuels that are obtained from electrolytic hydrogen - also referred to as e-fuels. E-fuels are considered low-carbon if produced by hydrogen using low-emission electricity and biogenic CO₂. Hence refineries with integrated biofuels production could capture synergies between biofuels and e-fuels production.

E-fuels could add further competitive pressures to the refining sector by the end of the decade if governments push ahead with ambitious targets to help decarbonise the transport sector. Significant reductions in fossil fuel demand are possible in road transport through fuel efficiency improvements and the continued increase of electric vehicles (EVs) within the vehicle fleet. While the aviation and marine sectors continue to be more reliant on fuel-based solutions, sustainable aviation fuels are increasingly becoming part of the fuel mix, while orders for new ships are showing a trend towards alternative fuels.

Refiners certainly have the skills required to develop and produce e-fuels. Moreover, beyond the chemical engineering, if e-fuels are to be part of the solution for transportation markets, they will need to be developed at scale, in a cost-effective manner and suitably integrated into existing marketing and distribution logistics. Moreover, while potentially well placed to contribute to the development of future projects, this could be a viable pathway for refiners to meet decarbonisation targets. E-fuel production could be scaled up rapidly towards 2030, if underpinned by a massive expansion of cheaper renewable electricity and anticipated cost reductions for electrolyzers. A recent IEA Report, [The Role of E-fuels in Decarbonising Transport](#), highlights the potential for this development. It assesses the implications in terms of needed cost reductions, resources, and infrastructure investments for an assumed ambitious goal of achieving 10% shares of e-fuels in aviation and shipping by 2030.

Levelised cost of e-kerosene by potential cost reduction measure



IEA. CC BY 4.0.

Source: IEA 2023 [The Role of E-fuels in Decarbonising Transport](#).

Low-emission e-fuels are currently expensive to produce, but their cost gap with fossil fuels could be significantly reduced by 2030. By the end of the decade, expected cost reductions in electrolyzers could cut the cost of low-emission e-kerosene to \$2 150/Mt (\$50/GJ), which would enable it to compete with biomass-based sustainable aviation fuels. The cost of low-emission e-methanol could be cut to \$700/Mt

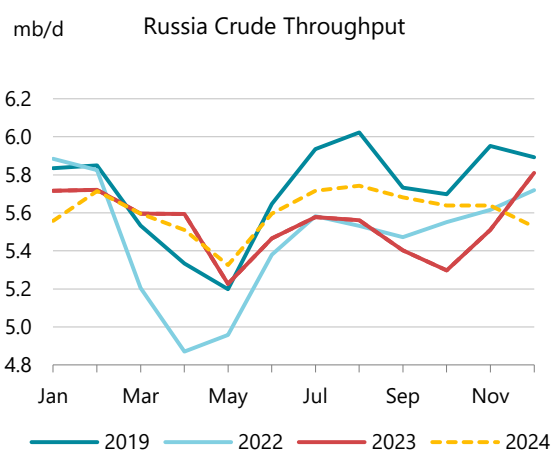
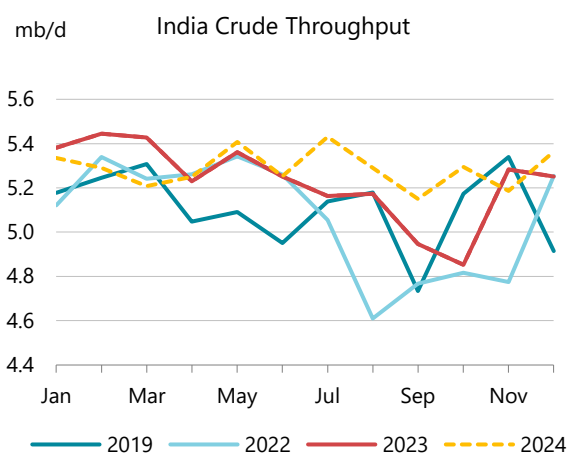
(\$35/GJ) and e-ammonia to \$550/Mt (\$30/GJ), making them cost comparable with the higher end of fossil methanol and ammonia prices over the 2010-2020 period as a chemical commodity - opening a door for their use as a low-emission fuels for shipping.

Low-emission e-fuels, while still costly in 2030, would have a limited impact on transport prices at a 10% share. At a cost of \$2 150/mt, e-kerosene would increase the ticket price of a flight by just 5%. Although e-methanol and e-ammonia are cheaper to produce than e-kerosene, their widespread use as shipping fuels will require significant investments in compatible bunkering infrastructure and ships. The total cost of ownership of a 100% e-ammonia or e-methanol-fuelled containership would be 75% higher than a conventional containership operating on fossil fuels. Although a substantial increase, the extra cost would represent less than 1% of the typical value of goods transported in containers and so could be passed on to consumers, without a significant impact.

To exploit potential decarbonisation options, while limiting the increase in consumer prices, operators need to achieve economies of scale, and this requires predictable demand. More than 200 e-fuels projects are currently under development around the world, although a large majority are at early stages. Accelerated deployment of these technologies remains reliant on governments adopting policies that create reliable demand for early projects, while supporting required infrastructure investments, driving down the cost of electrolyzers, encouraging R&D activities focused on developing new high-efficiency e-fuel technologies, and promoting the potential to exploit synergies among e-fuels, biofuels and carbon capture utilisation and storage.

While developing e-fuels at a commercial scale may take years to significantly impact markets/refiners, there remains the opportunity to leverage associated mid-stream infrastructure to seamlessly integrate increasing volumes of low-carbon fuels and capture processing synergies to improve investment economics.

Chinese crude runs remained relatively weak in November. According to Chinese government data, throughputs averaged 14.7 mb/d, some 300 kb/d below last month's estimate, as lacklustre demand and quota limits curtailed activity. We have revised December lower by a similar amount to 14.8 mb/d, but expect activity levels to pick up in 1Q24, to an average of 15.4 mb/d, following the issuance of new product export quotas



Indian throughputs rose by 430 kb/d m-o-m in November, to 5.3 mb/d, despite reports of increased maintenance activity during the month. We expect Indian crude runs to be maintained at close to, or

slightly above, this level as we head into 2024, before seasonal maintenance weighs on crude runs in the summer months. **Russian** November crude runs were 100 kb/d below forecast at 5.5 mb/d, but weekly data indicate that they improved further in December, and we estimate they averaged 5.8 mb/d last month. **Saudi Arabian** crude runs fell to a three-year low of 2.1 mb/d in October, as a heavy maintenance programme slashed runs by 750 kb/d m-o-m. We estimate runs recovered marginally in November, before normalising at close to 2.6 mb/d in 1Q24.

Product cracks and refinery margins

Refining margins fell on average in the Atlantic Basin during December but improved in Singapore. The US Gulf Coast's (USGC) m-o-m decline of between \$1.41-\$2.67/bbl, led the decline, surrendering more of last summer's out-performance. By historical standards, margins on the USGC remain healthy, but rising inventory cover across light and middle distillate markets during the month eased tightness and weighed on profitability. European margins edged lower by nearly \$1/bbl, with petrochemical integrated assets performing poorly. By contrast, Singapore margins strengthened on average during December, as tightness in the Asian crude markets eased, although here again, petrochemical integrated margins lost ground on a relative basis.

IEA Global Indicator Refining Margins										
\$/bbl	Monthly Average				Change		Average for week starting:			
	Sep 23	Oct 23	Nov 23	Dec 23	Nov - Dec	11 Dec	18-Dec	25-Dec	01-Jan	08-Jan
NW Europe										
Light sweet hydroskimming	12.36	4.76	7.43	6.81	-0.62	7.05	6.63	5.23	7.43	6.02
Light sweet cracking	16.57	8.95	11.65	10.69	-0.97	10.73	10.38	8.93	10.50	9.20
Light sweet cracking + Petchem	16.02	9.11	12.15	10.80	-1.35	10.99	10.23	8.81	10.53	9.24
Medium sour cracking*	23.38	14.23	18.81	18.27	-0.54	18.15	18.38	16.67	15.16	13.82
US Gulf Coast										
Light sweet cracking	23.53	12.40	11.73	10.10	-1.63	8.41	12.53	11.04	12.55	13.12
Medium sour cracking	30.55	20.14	17.96	16.55	-1.41	15.12	19.36	17.28	18.54	19.80
Heavy sour coking	38.46	27.26	27.18	24.51	-2.67	22.35	26.97	25.92	26.70	28.29
Singapore										
Light sweet cracking	8.89	4.49	7.72	8.23	0.51	8.55	8.99	7.74	8.16	6.49
Light sweet cracking + Petchem	9.24	5.23	8.58	8.43	-0.15	8.85	8.85	7.59	8.37	6.80
Medium sour cracking	12.31	6.67	7.18	9.76	2.58	10.27	10.80	9.54	10.11	9.32
Medium sour cracking + Petchem	12.65	7.40	8.03	9.96	1.92	10.56	10.66	9.39	10.32	9.63

Note: Mediterranean and US Midcontinent margins are available in Table 15 of this Report.

Source: IEA/Argus Media Group prices.

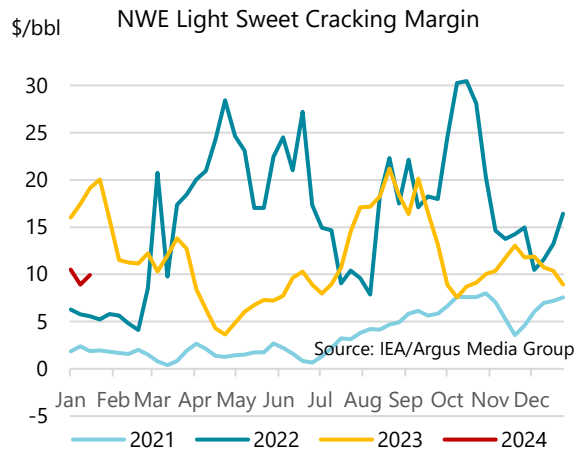
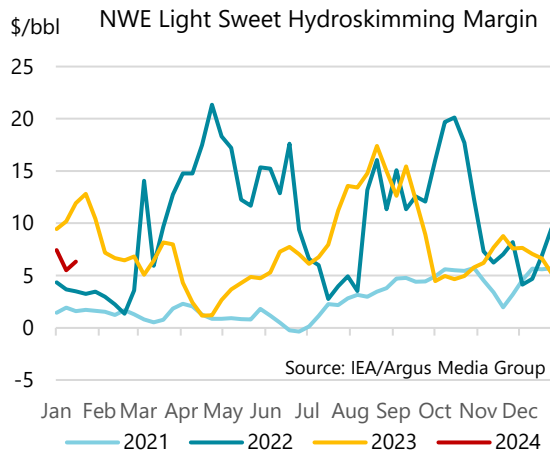
Methodology notes are available at <https://www.iea.org/topics/oil-market-report#methodology>

*From 1/12/2022, the basis has changed from Urals NWE to Argus Brent Sour

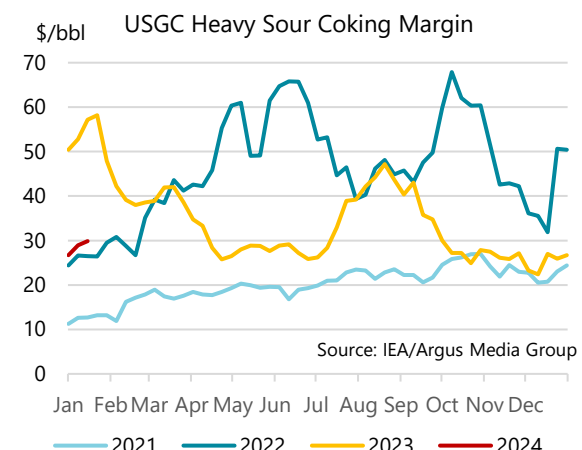
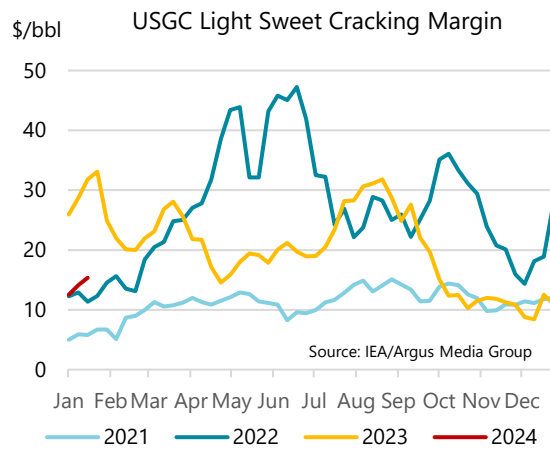
Global energy markets have undergone several dislocations following Russia's invasion of Ukraine in 1Q22. The loss of Russian product imports to European and US markets, and the re-routing of global trade flows, under the pressure of the EU embargo and G7 sanctions, boosted light and middle distillate cracks to the point that a new product market equilibrium could be reached. For Atlantic Basin markets, this new equilibrium appears to entail lower levels of inventory cover than the historical average, especially for jet fuel and diesel. Nevertheless, the narrowing of the spread between regional refining profitability measures in recent months points to a partial normalisation. December's average light sweet cracking margins in Europe, Singapore and the USGC were all within a \$2.50/bbl range, compared to the \$17/bbl spread seen in 3Q23.

European refining margins edged lower over the course of December, with **Northwest Europe** (NWE) finishing the month close to their 4Q23 lows. The decline in NWE margins was driven by weaker gasoline and middle distillate cracks and despite a further strengthening in regional naphtha cracks. As was the case in November, naphtha cracks improved as competing petrochemical

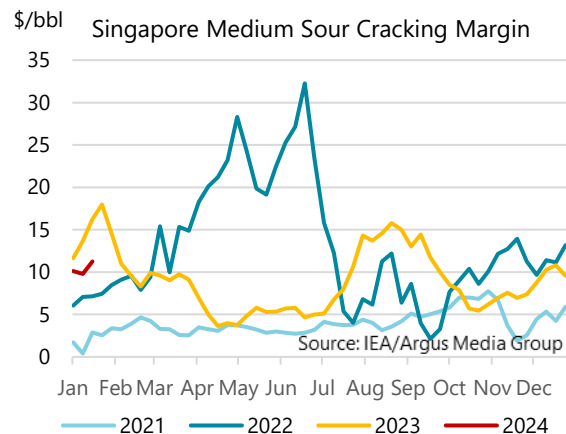
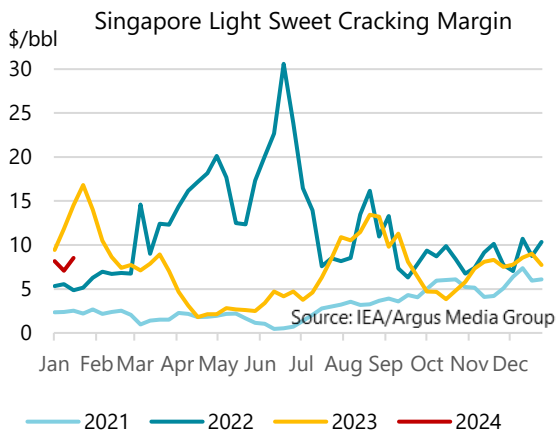
feedstock prices such as propane rallied. Naphtha cracks reached $-\$5.75/\text{bbl}$ in late December, the highest level since 1Q23. Conversely, **Mediterranean** margins strengthened by nearly $\$2/\text{bbl}$ on average m-o-m, adding to November's gains. Against the backdrop of stronger Mediterranean crude differentials, the loss of imported middle distillate supplies via the Suez Canal supported product cracks.



USGC refining margins slumped to a two-and-a-half-year low in mid-December, as diesel and gasoline cracks weakened for another month. Margins subsequently recovered and are now close to pre-Ukrainian conflict levels. Diesel cracks remain the main support for the overall level of margins, notwithstanding the further $\$6.55/\text{bbl}$ m-o-m decline in December. Coking margins recovered towards year-end and into early January. Additional supplies of Venezuelan crude may boost complex refining margins in the coming months, but the prospect of reduced Mexican heavy sour crude availability, and the start of the TMX expansion, will likely tighten USGC sour crude differentials.



Singapore margins strengthened in December, extending November's gains, although petrochemical profitability weighed on integrated refining margins. The easing of regional sour crude market tightness helped support margins, as the Dubai M1-M3 price market structure eased, narrowing by $\$1.40/\text{bbl}$ m-o-m in December. Consequently, sour crude margins regained a premium to light sweet crude processing. Furthermore, lower Chinese product exports, as quotas were exhausted for some refiners, tightened regional product markets and increased the region's reliance on Middle East product exports.



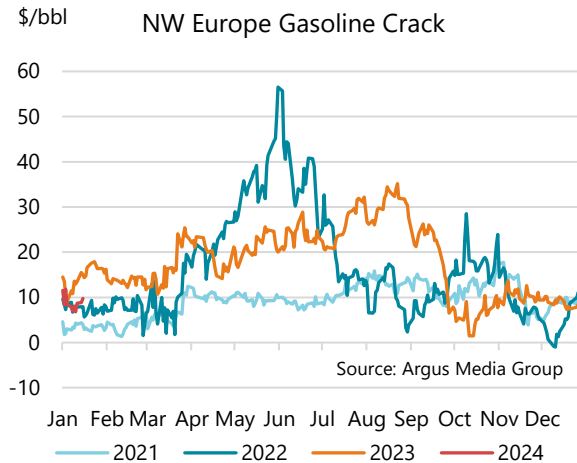
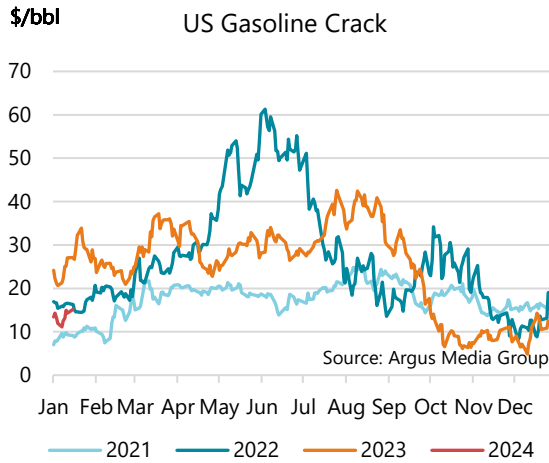
Product prices fell m-o-m across the board in December, except for naphtha, which rallied in Singapore and Europe, and fuel oil on the USGC. This extended October and November's weaker pricing trend and broadly tracked the decline in crude pricing. Jet fuel prices led the decline, falling by \$9.38/bbl m-o-m on average across the three regions we track. Nevertheless, jet fuel remains more expensive on a per barrel and per tonne basis than diesel as it competes for an increased share of product yields. Diesel prices fell by \$9.09/bbl m-o-m on average, as middle distillate market tightness eased. Gasoline prices also weakened by \$5.32/bbl on average. For the third month running, the USGC saw the largest monthly drop in average prices, closely followed by Europe.

Product Prices and Differentials (\$/bbl)													
	Prices			Differentials				Week Starting					
	Oct	Nov	Dec	Oct	Nov	Dec	Nov-Dec chg	11-Dec	18-Dec	25-Dec	01-Jan	08-Jan	
Northwest Europe				to North Sea Dated									
Gasoline	97.21	93.53	86.69	6.09	10.48	8.85	-1.63	9.26	7.96	8.37	10.03	7.88	
Diesel	122.28	114.84	105.48	31.15	31.78	27.63	-4.15	26.51	27.80	25.08	26.08	24.80	
Jet/Kero	123.52	117.16	107.57	32.40	34.11	29.72	-4.39	28.59	31.95	28.79	30.25	30.37	
Naphtha	72.52	70.58	71.51	-18.61	-12.48	-6.34	6.14	-5.47	-7.14	-6.48	-5.90	-6.07	
HSFO	76.14	70.01	67.09	-14.98	-13.04	-10.76	2.29	-9.61	-11.97	-12.49	-9.23	-10.32	
0.5% Fuel Oil	90.09	86.22	81.16	-1.04	3.16	3.31	0.15	3.37	3.15	3.51	5.44	2.88	
US Gulf Coast				to WTI Houston									
Gasoline	96.33	87.71	83.67	9.87	9.10	9.71	0.62	7.44	12.72	11.96	13.22	13.21	
Diesel	124.95	111.15	99.94	38.48	32.53	25.99	-6.55	24.00	29.06	26.49	28.32	32.11	
Jet/Kero	119.20	113.64	100.03	32.74	35.03	26.07	-8.96	24.96	29.40	25.02	27.95	33.43	
Naphtha	74.40	71.31	67.36	-12.06	-7.30	-6.59	0.71	-5.62	-6.24	-8.04	-7.07	-5.73	
HSFO	74.51	70.92	72.91	-11.96	-7.69	-1.04	6.65	1.18	-3.07	-2.65	-1.43	-6.06	
0.5% Fuel Oil	93.96	87.05	84.31	7.49	8.44	10.35	1.91	10.36	9.69	10.23	12.83	14.84	
Singapore				to Dubai									
Gasoline	93.71	92.36	87.26	2.62	7.25	8.56	1.31	8.84	9.34	8.80	8.78	8.32	
Diesel	117.46	106.48	99.78	26.37	21.37	21.08	-0.29	21.46	22.14	20.13	20.98	21.91	
Jet/Kero	113.58	106.63	101.70	22.50	21.52	22.99	1.48	23.28	23.93	20.01	21.51	22.26	
Naphtha	70.80	69.57	72.69	-20.29	-15.54	-6.02	9.52	-5.30	-4.53	-4.75	-7.16	-8.21	
HSFO	72.99	69.51	67.93	-18.10	-15.60	-10.78	4.82	-9.85	-10.40	-10.77	-8.17	-11.74	
0.5% Fuel Oil	100.04	99.03	88.96	8.96	13.92	10.26	-3.66	9.26	10.97	10.55	10.47	7.65	

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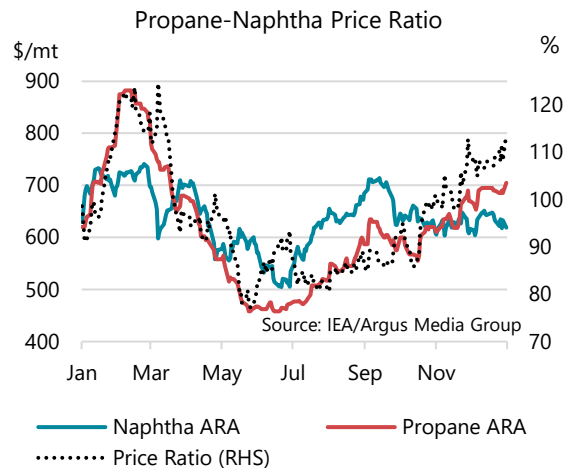
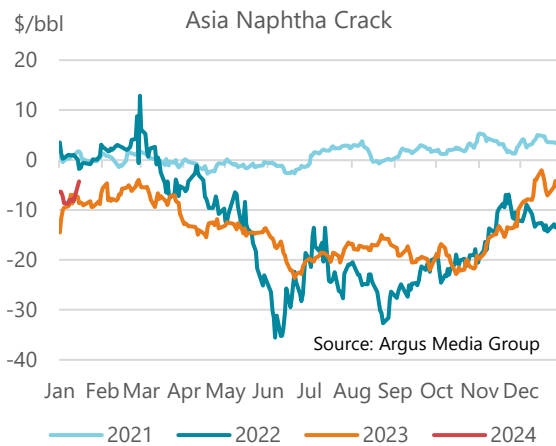
HSFO and VLSFO prices almost universally declined, with Singapore VLSFO falling by \$10.07/bbl m-o-m, following the restart of the Al Zour refinery that eased market tightness. USGC HSFO increased by \$2/bbl, bucking the weakness in Europe and Singapore.

Gasoline prices fell globally in December, by between -\$4.04/bbl and -\$6.84/bbl m-o-m, with losses in Northwest Europe outpacing those elsewhere. Consequently, European gasoline cracks fell, but improved on the USGC and Singapore by around \$1/bbl. European gasoline cracks gave back nearly half of their November increase in December but had recovered to above \$10/bbl by early January. By mid-December, USGC cracks reversed their weakness from earlier in the month and rallied from sub-\$7/bbl, to above \$13/bbl in mid-January.

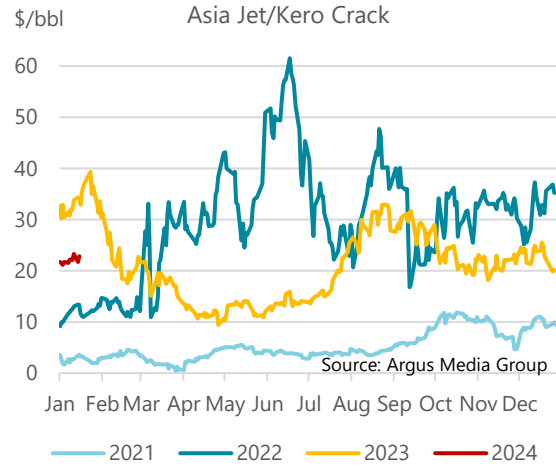
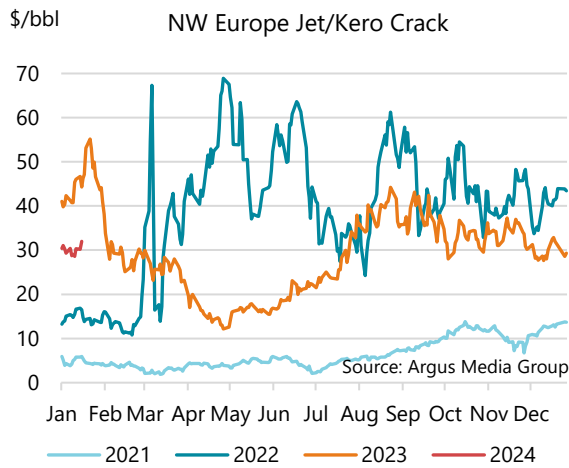


Naphtha prices rallied in Singapore, by \$3/bbl m-o-m, while European naphtha prices gained \$1/bbl in December, bucking the broader product price decline. As highlighted last month, naphtha pricing for both these markets is driven by competition in petrochemical feedstock markets from propane. Consequently, as propane has continued to strengthen, so too naphtha prices in Asia and Europe rallied. As a result, naphtha cracks improved by more than \$6/bbl in Europe and \$9/bbl Singapore, as colder Northern Hemisphere weather supported propane demand and pricing.

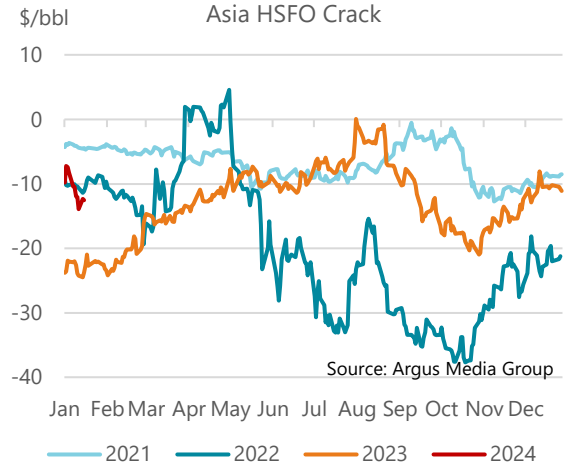
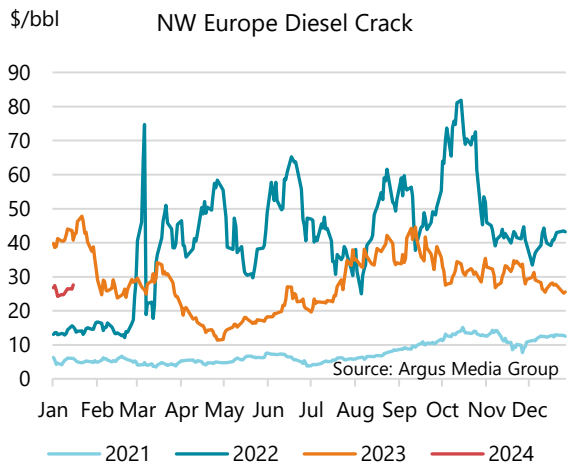
Conversely, USGC naphtha values fell m-o-m by \$4/bbl. The different pricing dynamic is driven by USGC naphtha being closely tied to gasoline prices, as the benchmark regional naphtha grade is reformer-feed specification, rather than being used as a petrochemical feedstock for ethylene production.



Jet fuel prices were the worst performing amongst all products in December, with the USGC leading the decline. USGC jet fell by \$13.62/bbl m-o-m, setting the global floor for much of the first half of December (see *Changing product market dynamics lift European middle distillate premiums* in the December 2023 OMR). Declines in Europe and Singapore were more measured, dropping by \$4.93-\$9.6/bbl m-o-m. The collapse in USGC pricing cut jet fuel cracks by \$9/bbl, to \$26/bbl, while European cracks slipped by \$4.39/bbl to \$30/bbl. Singapore cracks rallied \$1.48/bbl to \$23/bbl. Despite this decline, jet cracks remain above diesel on both a per barrel and per tonne basis in all three pricing hubs.



Diesel prices continued to decline in December, again outpacing the losses in crude prices, albeit only marginally in Singapore. In common with jet fuel, USGC prices led December’s drop, falling by \$11.20/bbl m-o-m. USGC diesel prices retreated to seven-month lows in December, averaging less than \$100/bbl for the first time since June 2023. Declines in Europe and Singapore were less severe, dropping by \$9.36/bbl and \$6.70/bbl, respectively m-o-m. The collapse in USGC pricing cut diesel cracks by \$6.55/bbl, to \$26/bbl, while European cracks slipped by \$4.15/bbl to \$27.6/bbl and, Singapore cracks eased \$0.29/bbl to \$21/bbl. European cracks have regained their premium to other regions as the threat to imports from the Middle East and Asian refineries boosted values.



High sulphur fuel oil (HSFO) prices declined further in December in Europe and Singapore, although on the USGC prices improved. Consequently, HSFO cracks, though still negative, posted average m-o-m gains during December of between \$2-7/bbl, with the USGC strongest. By mid-January, Europe and Singapore cracks are close to four-month highs, at around -\$12/bbl.

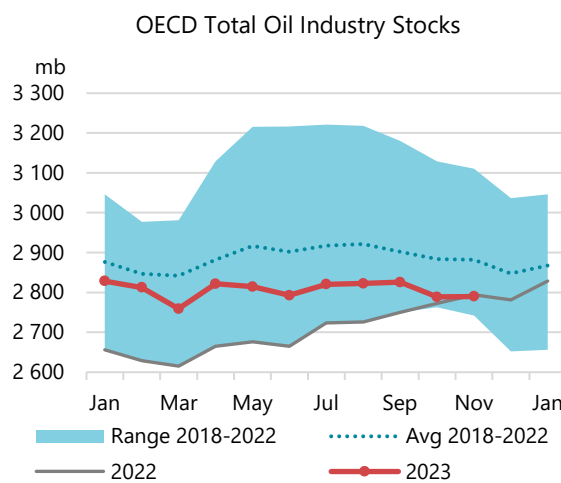
Stocks

Overview

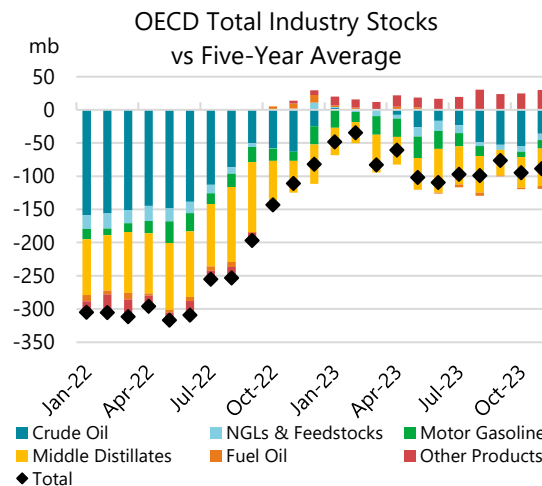
Global observed oil inventories were down by 8.4 mb in November to their lowest since July 2022. A decline in oil on water (-12 mb) was partially offset by on-land stock builds (+3.6 mb), mainly in OECD countries (+3.3 mb). Oil products decreased by a substantial 24.6 mb, while crude oil rose by 16.2 mb. Refinery throughputs rebounded but remained at a three-year seasonal low. Chinese crude stocks fell despite a sharp drop in refinery intake as imports slumped due to limited crude import quotas. Preliminary data suggest the global inventories rose in December, as oil on water surged while both OECD and non-OECD onshore stocks declined.



Sources: IEA, Kayrros, Kpler, FEDCom/S&P Global Platts, Enterprise Singapore



OECD industry stocks rose by a modest 1.3 mb in November, to 2 790 mb, which covered 61.3 days of forward demand. Commercial inventories remained 92 mb below the five-year average with all categories in deficit, except other products, which include LPG. Crude, NGL and feedstock inventories rose counter-seasonally by 17 mb. This was due to a significant build of 18.1 mb in the OECD Americas. Product stocks drew by a larger-than-normal 15.7 mb, led by middle distillates (-8.4 mb). Middle distillate inventories stood at 483.3 mb at end-month, the lowest for November since 1988 according to the available data. In OECD Europe, they notably drew by 8.4 mb to their lowest level in our records, which go back 16 years. Other product stocks fell by 11.9 mb, largely in line with the seasonal norm. Gasoline inventories rose by 4.6 mb, half the level of the historical trend (+8.8 mb). Fuel oil stocks edged up by 0.1 mb.



Preliminary data for December show a stock draw of 23.3 mb, with declines in the United States (-14.1 mb), Japan (-6.2 mb) and Europe (-3 mb). Crude oil, NGL and feedstock inventories reversed the builds seen in the previous month, falling by 19.1 mb, mainly in the United States (-16.4 mb). Oil

product stocks decreased by 4.2 mb, led by Japan (-3.6 mb) and Europe (-3 mb). Seasonal declines in other products (-31.5 mb) were mostly offset by increases in gasoline (+17.5 mb) and middle distillates (+12.5 mb). Fuel oil inventories were down by 2.7 mb.

Preliminary OECD Industry Stock Change in November 2023 and Third Quarter 2023												
	November 2023 (preliminary)				Third Quarter 2023							
	(million barrels)				(million barrels per day)							
	Am	Europe	As.Ocean	Total	Am	Europe	As.Ocean	Total	Am	Europe	As.Ocean	Total
Crude Oil	18.8	-3.4	5.3	20.6	0.6	-0.1	0.2	0.7	-0.4	-0.2	-0.1	-0.7
Gasoline	4.0	0.6	0.0	4.6	0.1	0.0	0.0	0.2	0.1	0.1	0.0	0.2
Middle Distillates	1.4	-8.4	-1.4	-8.4	0.0	-0.3	0.0	-0.3	0.1	0.1	0.1	0.3
Residual Fuel Oil	-1.3	1.6	-0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Other Products	-10.7	-1.4	0.2	-11.9	-0.4	0.0	0.0	-0.4	0.5	0.1	0.0	0.5
Total Products	-6.6	-7.6	-1.5	-15.7	-0.2	-0.3	-0.1	-0.5	0.6	0.3	0.1	1.0
Other Oils ¹	-0.7	-1.6	-1.3	-3.6	0.0	-0.1	0.0	-0.1	0.1	-0.1	0.1	0.1
Total Oil	11.5	-12.7	2.5	1.3	0.4	-0.4	0.1	0.0	0.3	0.0	0.1	0.4

¹ Other oils includes NGLs, feedstocks and other hydrocarbons.

OECD commercial stocks for October were revised down by 23.7 mb following the submission of more complete data. The largest adjustment came from OECD Americas (-14.3 mb), followed by OECD Europe (-11.9 mb). Middle distillate inventories were revised down by 14.7 mb, mainly in OECD Europe (-12.8 mb). Crude oil stocks were raised by 2.2 mb as upward adjustments in OECD Asia Oceania (+6.3 mb) and OECD Europe (+2.7 mb) were partially offset by downward revisions in OECD Americas (-6.8 mb). September data for overall stocks were also lowered, by 5.8 mb.

OECD Industry Stock Revisions versus December 2023 Oil Market Report								
	(million barrels)							
	Americas		Europe		Asia Oceania		OECD	
	Sep-23	Oct-23	Sep-23	Oct-23	Sep-23	Oct-23	Sep-23	Oct-23
Crude Oil	-2.3	-6.8	-0.8	2.7	0.0	6.3	-3.1	2.2
Gasoline	0.0	-1.8	-0.3	-0.2	0.0	-0.4	-0.3	-2.4
Middle Distillates	0.0	-1.0	-1.9	-12.8	-0.9	-0.9	-2.8	-14.7
Residual Fuel Oil	0.0	-1.1	0.0	0.0	0.0	0.0	0.0	-1.0
Other Products	0.0	-1.7	0.1	-1.3	0.0	-2.5	0.1	-5.4
Total Products	0.0	-5.5	-2.1	-14.3	-0.9	-3.7	-3.0	-23.5
Other Oils ¹	0.0	-2.0	0.3	-0.3	0.0	-0.1	0.3	-2.4
Total Oil	-2.2	-14.3	-2.6	-11.9	-0.9	2.5	-5.8	-23.7

¹ Other oils includes NGLs, feedstocks and other hydrocarbons.

Implied balance

In November, global observed inventories fell by 280 kb/d. OECD industry crude stocks rose by 570 kb/d but were partially offset by a 520 kb/d draw in OECD commercial products. OECD government inventories built by 70 kb/d. Non-OECD crude stocks were unchanged from the previous month while product stocks increased by a marginal 10 kb/d. Oil on water fell by 400 kb/d, mainly in products (-310 kb/d). Global demand and supply forecasts imply a 1.4 mb/d stock build in the month. The 1.7 mb/d discrepancy between the global balance and observed stock changes may be attributed to differences in the timing for reporting of supply, demand and inventory changes, as well as product stock changes not well covered in available data.

IEA Global oil balance (implied stock change) (mb/d)									
	2020	2021	2022	1Q23	2Q23	3Q23	Oct-23	Nov-23	Dec-23
Global oil balance	2.21	-2.01	0.63	1.61	-0.01	-0.92	0.00	1.44	0.26
Observed stock changes									
OECD industry stocks	0.41	-1.06	0.35	-0.25	0.37	0.36	-1.19	0.04	-0.75
OECD government stocks	0.02	-0.16	-0.74	0.03	-0.12	0.03	-0.04	0.07	0.09
Non-OECD crude stocks*	0.43	-0.46	0.26	0.20	0.53	-0.19	-0.71	0.00	-0.63
Selected non-OECD product stocks**	0.12	-0.02	-0.01	0.35	-0.17	0.03	-0.12	0.01	0.11
Oil on water	0.03	-0.04	0.28	0.16	-0.66	-0.54	0.88	-0.40	
Total observed stock changes	1.01	-1.73	0.15	0.49	-0.06	-0.32	-1.19	-0.28	
Unaccounted for balance	1.21	-0.27	0.48	1.13	0.05	-0.60	1.19	1.72	

*Crude stock change data from Kayrros and estimated Saldanha Bay data from Kpler.

Kayrros data are available for selected countries and include only, and not all, above-ground storage.

**JODI data adjusted for monthly gaps in reporting, latest data for October 2023, plus Fujairah and Singapore inventories.

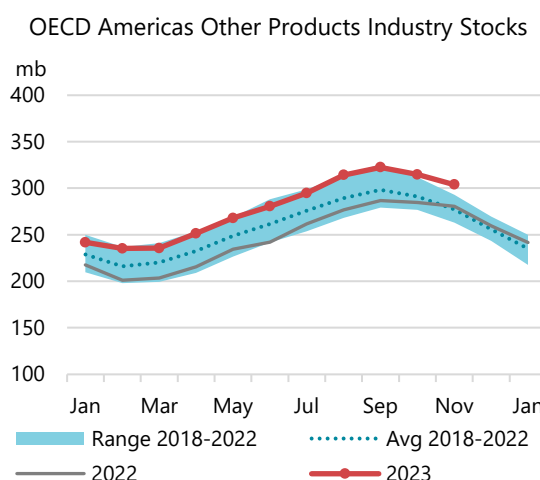
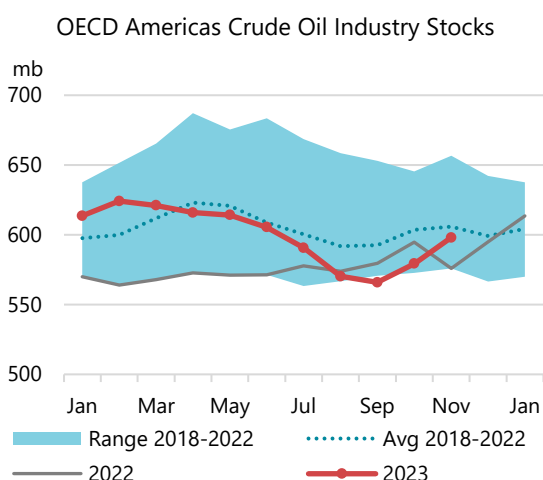
Sources: IEA, EIA, PAJ, Euroilstock, Kayrros, JODI, Kpler, FEDCom/S&P Global Platts and Enterprise Singapore.

Recent OECD industry stock changes

OECD Americas

Industry stocks in the OECD Americas built by 11.5 mb to 1 531 mb in November. Regional inventories were only 10.8 mb below the 2018-2022 average, as other products were 26.5 mb above the historical norm and as crude oil stocks rose by 18.8 mb to a five-month high. Regional refinery intake increased seasonally but was still 900 kb/d lower than a year ago. NGL and feedstock inventories edged down by 0.7 mb.

Oil product stocks in the region declined by 6.6 mb. The decrease was led by other products (-10.7 mb), but the drop was smaller than usual due to weak demand. Fuel oil inventories fell by 1.3 mb to 32 mb. In the United States, they fell by 1.5 mb, to the lowest level since December 2021, suggesting persistent difficulties in finding alternatives to Russian supply. Gasoline stocks increased by 4 mb, largely in line with the seasonal trend. Middle distillate inventories rose by 1.4 mb but, at 179.3 mb, they were a record low for November in the available data since 1988. US diesel inventories have been particularly low since 2022.

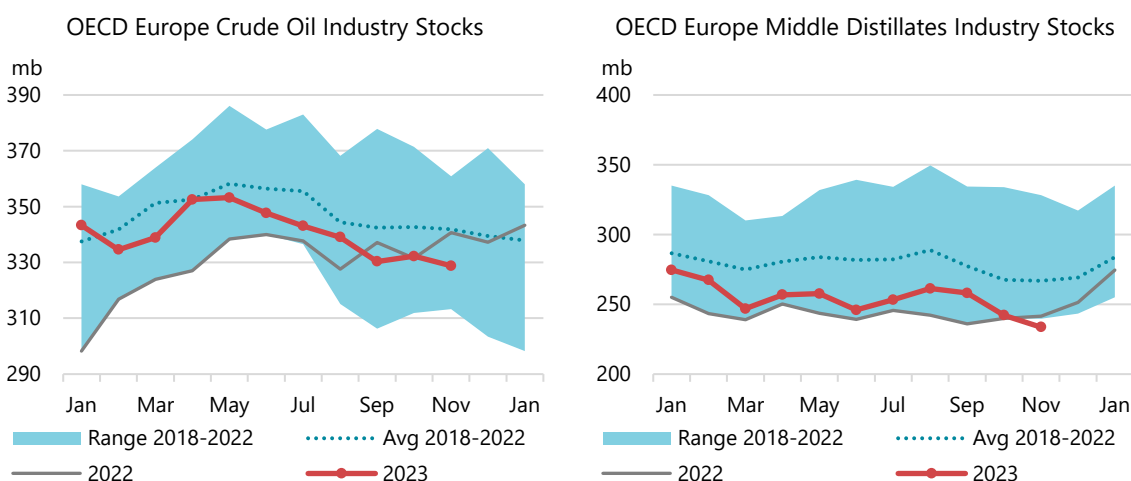


Weekly data from the US Energy Information Administration (EIA) suggest that industry stocks fell by 14.1 mb in December. Crude oil inventories declined by 13.4 mb, twice the level of the five-year average. Other oil stocks decreased by 3 mb, in line with the seasonal trend. Oil product inventories rose by 2.3 mb. Middle distillate stocks posted the largest increase, up by 18.2 mb, mostly in diesel (16.5 mb). Gasoline stocks increased more than the historical pattern by 16.8 mb. Other products led the declines with a massive 31.8 mb draw due to higher demand and robust LPG exports. Fuel oil stocks inched down by 0.9 mb. US refinery runs were 1 mb/d higher than a year ago, which partially explains lower crude oil and higher gasoline and diesel inventories.

OECD Europe

Commercial stocks in OECD Europe dipped by 12.7 mb in November, when they usually rise by 3.7 mb. At 894.6 mb, they were the lowest since March 2022 and 59 mb below the five-year average. Crude oil stocks fell by 3.4 mb, led by Italy (-3 mb), Spain (-2.2 mb) and Sweden (-2.2 mb), while they built by 3.3 mb in the Netherlands. NGL and feedstock inventories also declined, by 1.6 mb.

Petroleum product stocks dropped counter-seasonally by 7.6 mb, to a 20-month low. Middle distillate inventories plunged by 8.4 mb to 233.6 mb, the lowest level in 16 years. The United Kingdom posted the largest decrease at 3 mb and their stocks fell to their lowest level since 1996. Other product inventories fell counter-seasonally by 1.4 mb. Gasoline stocks increased less than usual by 0.6 mb and fell to below the five-year range. Fuel oil rose by 1.6 mb, largely in line with the five-year average.



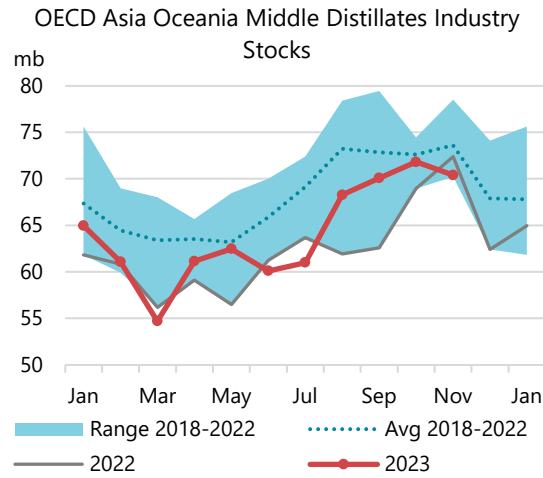
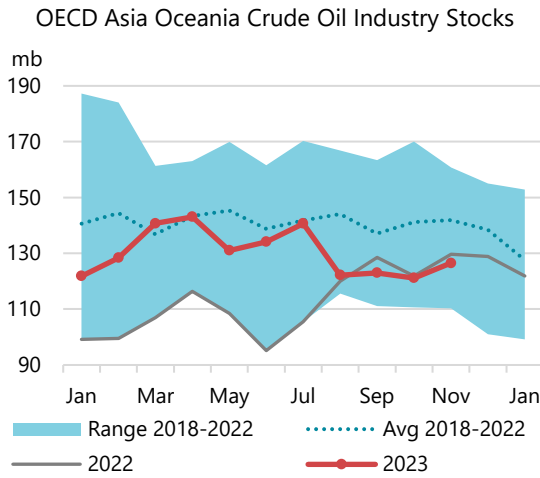
European industry stocks fell by 3 mb in December, according to preliminary data from *Euroilstock*. Regional crude oil inventories were unchanged as large stock builds in Italy (+3.7 mb) were offset by draws in Germany (-1.1 mb) and Spain (-1.1 mb). Oil product inventories declined by 3 mb. Middle distillate stocks dropped again, by 2 mb. Fuel oil also fell by 2 mb, led by Italy (-1.1 mb). Gasoline stocks rose by 1 mb, while naphtha inventories were stable.

OECD Asia Oceania

Commercial oil inventories in OECD Asia Oceania rose by 2.5 mb in November. They stood at 364.1 mb, 22.3 mb below the five-year average. Crude oil stocks increased by 5.3 mb, led by a 3.9 mb build in Japan. Korean crude stocks also built, by 1.4 mb, following seven consecutive months of decline. NGL and feedstock inventories fell by 1.3 mb.

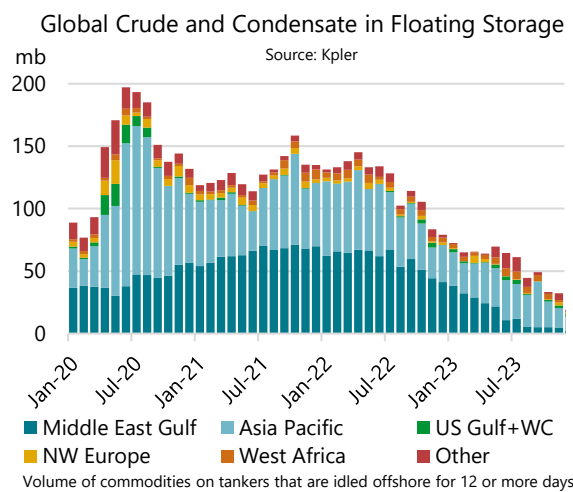
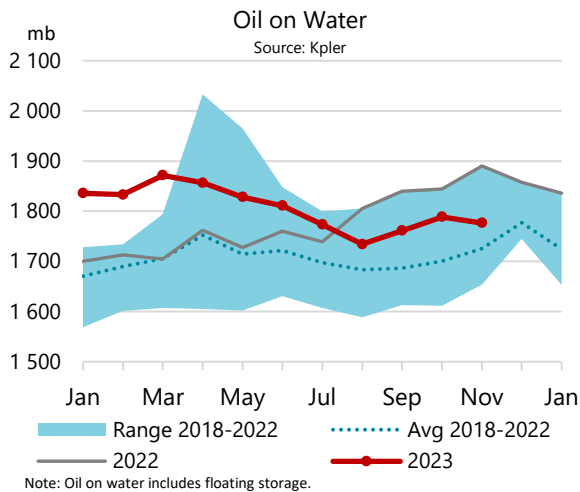
Oil product stocks were down by 1.5 mb, in line with the seasonal norm. Middle distillate stocks decreased counter-seasonally by 1.4 mb, led by Japan (-1 mb). Fuel oil edged down by 0.2 mb. By

contrast, other products rose by a marginal 0.2 mb when they usually decline by 1.9 mb. Korean other product stocks rose counter-seasonally, by 1.6 mb, to a record seasonal high of 21.2 mb. Gasoline inventories were stable in the month when they typically fall by 1 mb.



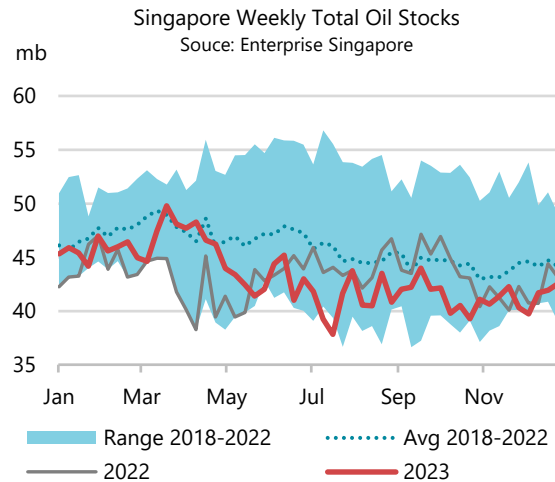
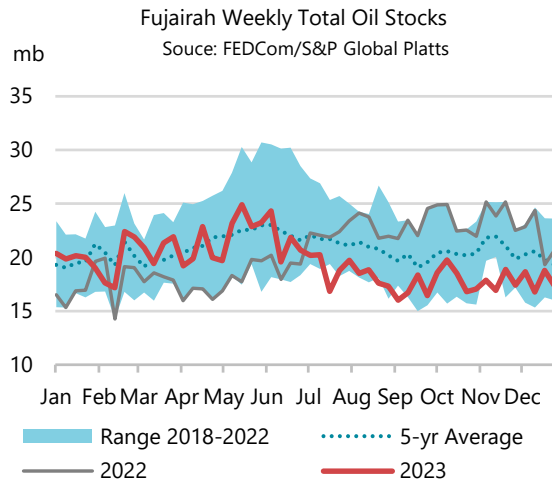
Preliminary data from the *Petroleum Association of Japan (PAJ)* show industry inventories declined by 6.2 mb in December. Crude oil stocks fell counter-seasonally by 1.3 mb, despite lower refinery crude input (-150 kb/d y-o-y). Crude imports were 2.3 mb/d, a seasonal low since at least 2013, according to *Kpler*. Other oil inventories also decreased by 1.3 mb, in line with the five-year average. Petroleum product stocks declined by 3.6 mb, matching the historical pattern. Middle distillate inventories decreased by 3.7 mb as the heating season started. Gasoline stocks eased by 0.3 mb while fuel oil and other product inventories rose by a modest 0.2 mb and 0.3 mb, respectively.

Other stock developments



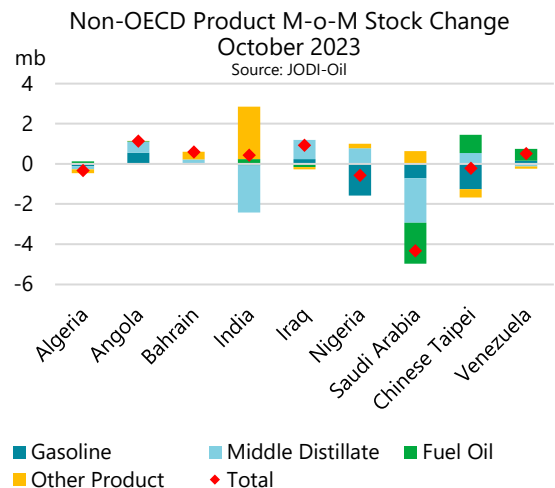
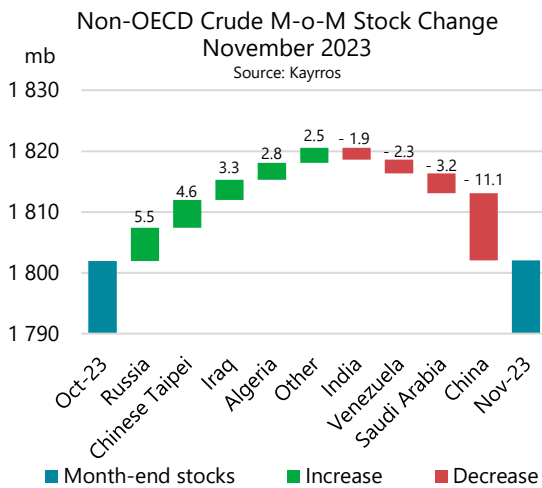
Oil on water, including floating storage, dropped by 12 mb to 1 777 mb in November, according to tanker tracking data from *Kpler*. Crude oil fell by 2.7 mb. Oil products were down by 9.2 mb, led by naphtha (-4.3 mb) and fuel oil (-7.2 mb), while LPG (+4.6 mb) increased. The volume of LPG on water hit a record high at 120 mb, due to robust exports from the United States and longer voyage times because of the limited Panama Canal crossings. Crude oil in floating storage decreased by 1.1 mb to 32.2 mb. They declined in Asia (-5 mb) and West Africa (-2.5 mb) but rose in other areas such as Northwest Europe and North Africa. Floating storage for oil products dipped by 0.9 mb

to 51.9 mb, mainly in Asia and West Africa. Early data suggest a substantial increase in oil on water in December.



Independent product stocks in Fujairah rose by 0.8 mb to 17.9 mb in November, according to *FEDCom* and *S&P Global Platts* data. Middle distillate inventories increased by 1.1 mb to a five-month high. Light distillate stock gained by 0.8 mb and recovered to the five-year range. By contrast, heavy distillate and residue inventories declined by 1.1 mb. In December, total stocks built by a further 1 mb to 18.9 mb, led by light distillates (+1.9 mb).

In Singapore, the world's largest bunkering hub, product stocks inched down by 0.6 mb in November, according to data from *Enterprise Singapore*. At 40.2 mb, they were the lowest since the end of 2021. Residual fuel inventories were unchanged but light and middle distillates drew by 0.3 mb each. In December, total stocks rose by 2.4 mb to a five-month high, as a result of builds in residual fuels (+2.4 mb) and light distillates (+1.3 mb), while middle distillates (-1.3 mb) fell below year-ago levels.



Non-OECD crude oil stocks in floating-roof tanks were largely unchanged in November, according to satellite images from *Kayrros*. Chinese crude inventories fell for a fourth consecutive month, by 11.1 mb, to their lowest since April 2023, despite lower refinery activity. In Venezuela, crude oil stocks fell by 2.3 mb to 18.7 mb, the lowest since at least 2016, as easing sanctions gave way to higher exports. By contrast, Iraqi inventories built by 3.3 mb, hitting a new record in the available data. Crude stocks in Russia jumped by 5.5 mb due to export disruptions at Novorossiysk. In December, non-OECD crude oil inventories declined by 19.5 mb to a 14-month low. Egyptian crude

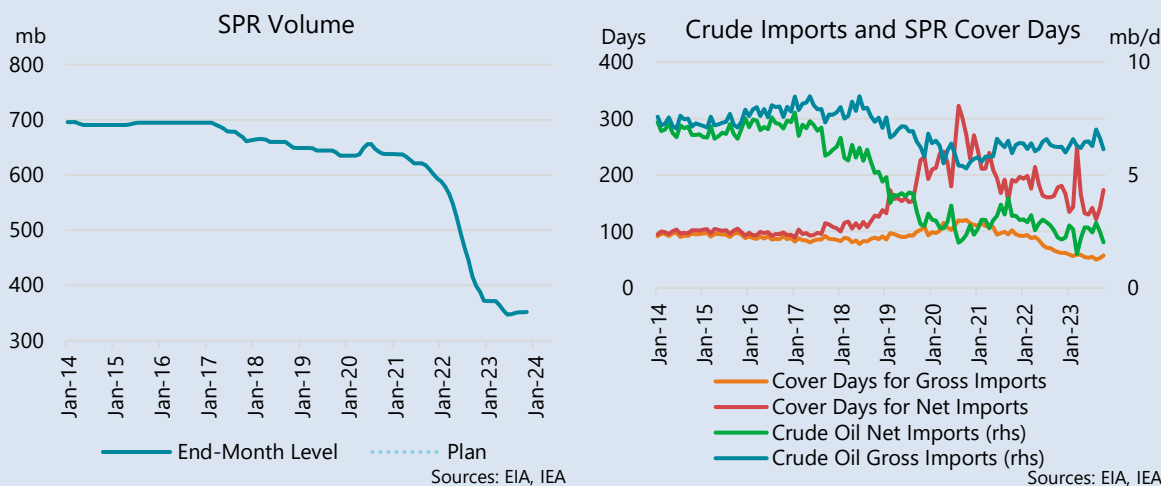
oil stocks fell by 5.6 mb. Inventories at the Sidi Kerir terminal fell by 4.2 mb as crude imports at Ain Sukhna have been lowered since July when Saudi Arabia started the extra cuts, according to *Kpler*.

In October, oil product stocks in the 11 non-OECD economies reporting to the *JODI-Oil World Database* fell by 1.8 mb. Saudi Arabia (-4.3 mb) led the decrease, mainly in middle distillates (-2.2 mb) and fuel oil (-2 mb), as refinery output slumped to a three-year low. In Nigeria, product stocks were down by 0.6 mb due to lower gasoline inventories (-1.6 mb). The declines were partially offset by other countries such as Angola (+1.1 mb), Iraq (+0.9 mb), and Bahrain (+0.6 mb).

United States is progressively replenishing their strategic oil reserve

Following the release of a record 180 mb of crude oil stocks from its Strategic Petroleum Reserve (SPR) in the aftermath of Russia’s invasion of Ukraine and 26 mb of Congress mandatory sales, the United States are gradually replenishing its emergency stocks. So far, 13.8 mb of crude oil have been purchased for the SPR since last summer, according to the U.S. Department of Energy (DOE). Purchases planned from October to December 2023 were cancelled amid crude oil prices above \$80/bbl. However, a further 3 mb per month of tenders have been announced for April and May, taking the total to 20 mb, or roughly 11% of the volumes released in 2022.

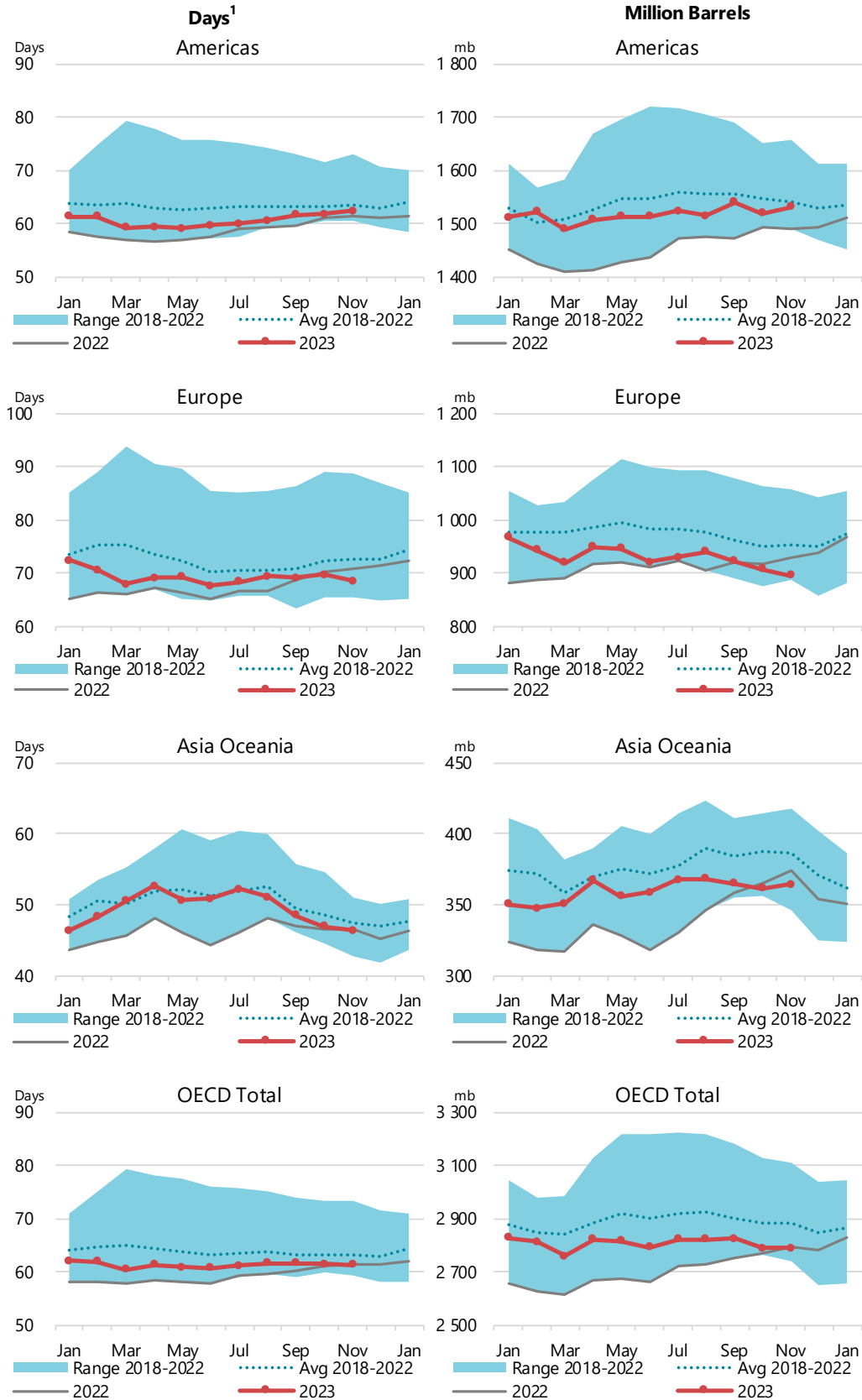
As a net exporter, the United States is not obligated to hold emergency oil stocks under IEA membership requirements. US net crude oil imports have fallen dramatically from 8 mb/d 10 years ago to around 2 mb/d, thanks to robust light tight oil (LTO) production, while product exports have increased to around 5 mb/d. However, while the United States is currently the world’s largest oil producer, it is also the second largest importing country globally after China, importing 6 mb/d on average. This is due not only to Western Canada’s restricted access to export markets outside the United States, but also due to complex refinery configurations on the Gulf Coast, better suited for heavier crudes than lighter domestic grades. The refining industry’s persistent dependence on foreign grades to optimise operations, means that their SPR remains critical avoiding supply disruptions.



DOE officials have stated that SPR buying is limited to 3 mb per month, or 100 kb/d, due to physical constraints. The oil purchased for the SPR so far cost \$75.63/bbl on average, well below the \$95/bbl received for the 2022 sales. At similar prices, approximately 50 mb, or more than one year at the maximum pace of fills, could be purchased with the remaining funds from the SPR release in 2022.

Regional OECD End-of-Month Industry Stocks

(in days of forward demand and million barrels of total oil)



¹ Days of forward demand are based on average OECD demand over the next three months.

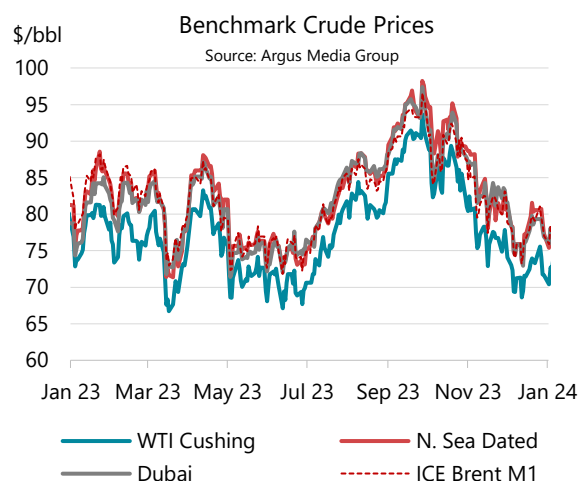
Prices

Overview

Oil prices strengthened to \$80/bbl in mid-January in the wake of missile attacks on ships in the Red Sea by Yemen's Iran-backed Houthi forces, thereby reviving the geopolitical risk premium. Exchange short covering added to the rebound after investor positioning in December had turned ultra-bearish, making for a crowded trade. North Sea Dated fell \$3/bbl in December to \$77/bbl, the benchmark's third consecutive monthly decline. As record US oil production made its way into the Atlantic Basin and the pace of oil demand growth slowed, physical balances remained comfortable. The impact of the attacks was more apparent in the forward price structure, which firmed on the view that geopolitical tensions are rising and diverted cargoes will lengthen vessel journey times.

North Sea Dated ended the year about \$20/bbl below September's year-high, and declined by \$4/bbl during 2023 – its first annual drop since 2020. Early January saw prices recover somewhat, after Libya's largest oil field, Shahara, was shut by protesters and joint US/UK airstrikes were launched against the Houthi militia. These developments outweighed bearish factors following Saudi Aramco's decision to lower official selling prices for Asian buyers. At the time of writing, North Sea Dated was trading around \$80/bbl.

December's crude price slump stood in marked contrast to booming stock and bond markets. Investor sentiment, already benign, turned euphoric after the US Federal Reserve effectively pivoted from raising to lowering interest rates in its December meeting, pencilling in three rate cuts in 2024. Economic data readings stayed mostly supportive at year end, adding to the optimism. Major stock market indices in the United States and Europe broke new record highs, while the 10-year US Treasury rate pulled below 4%, compared to an October high of 5%.



Even if the now-mainstream view of a soft landing materialises, 2024 looks set to be a year of subdued global economic growth, weighed down by the lagged impact of monetary tightening and a squeeze in bank lending. Regionally, US economic resilience compares with a flagging eurozone that may well re-enter recession, and a Chinese economy at risk of sliding into a deflationary spiral. Underscoring China's economic troubles, its benchmark CSI 300 stock market index was down by around -11% in 2023 - in sharp contrast to large gains elsewhere.

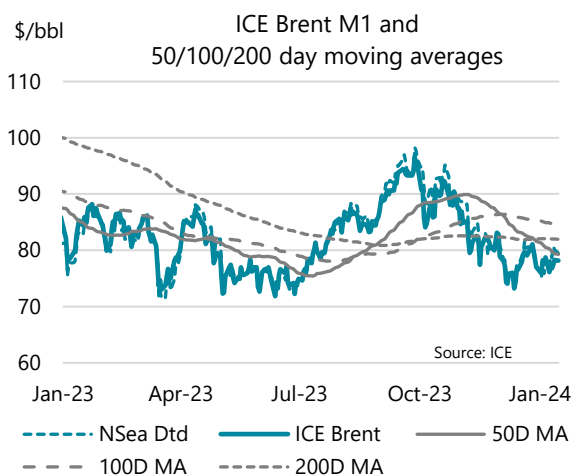
Crude Prices and Differentials (\$/bbl)								
	Month		Week of:	Last:	Changes Dec-23			
	Oct 2023	Nov 2023	Dec 2023	25 Dec	12 Jan	*Monthly Δ	m-o-m Δ	y-o-y Δ
Crude Futures (M1)								
NYMEX WTI	85.47	77.38	72.12	73.28	72.68	-4.31	-5.25	-4.39
ICE Brent	88.70	82.03	77.32	79.04	78.29	-5.79	-4.71	-4.02
Crude Marker Grades								
North Sea Dated	91.12	83.05	77.85	79.03	80.06	-3.23	-5.21	-2.51
WTI (Cushing)	85.57	77.44	72.08	73.28	72.68	-4.31	-5.35	-4.42
Dubai (London close)	89.27	83.33	77.16	78.06	78.36	-4.82	-6.17	0.09
Differential to North Sea Dated								
WTI (Cushing)	-5.55	-5.62	-5.77	-5.75	-7.38	-1.08	-0.15	-1.91
Dubai (London close)	-1.86	0.28	-0.69	-0.96	-1.70	-1.59	-0.96	2.60
Differential to ICE Brent								
North Sea Dated	2.42	1.02	0.52	-0.01	1.77	2.56	-0.50	1.51
NYMEX WTI	-3.24	-4.65	-5.20	-5.76	-5.61	1.48	-0.55	-0.38

Sources: Argus Media Group, ICE, NYMEX (NYMEX WTI = NYMEX Light Sweet Crude).

*Monthly Δ refers to the difference in price between the current and previous end of month.

Futures markets

Crude oil futures fell by about \$5/bbl during December. Discounting ongoing positive macro sentiment and a weaker US dollar, traders focussed on well-supplied physical balances. December brought another month of solid US crude stock builds in the NYMEX delivery hub of Cushing, Oklahoma, as well as in refined products. Prices recovered some of their losses mid-month after a spate of missile attacks targeting oil tankers navigating the Red Sea forced investors to rethink the widely-accepted view that the Israel-Hamas war would not affect physical oil flows. Crude's technicals remained dismal, with prices trading below key moving averages during the entire month. Brent ended December \$5/bbl, \$8/bbl and \$5/bbl below its 50-, 100-, and 200-day resistance levels, respectively.



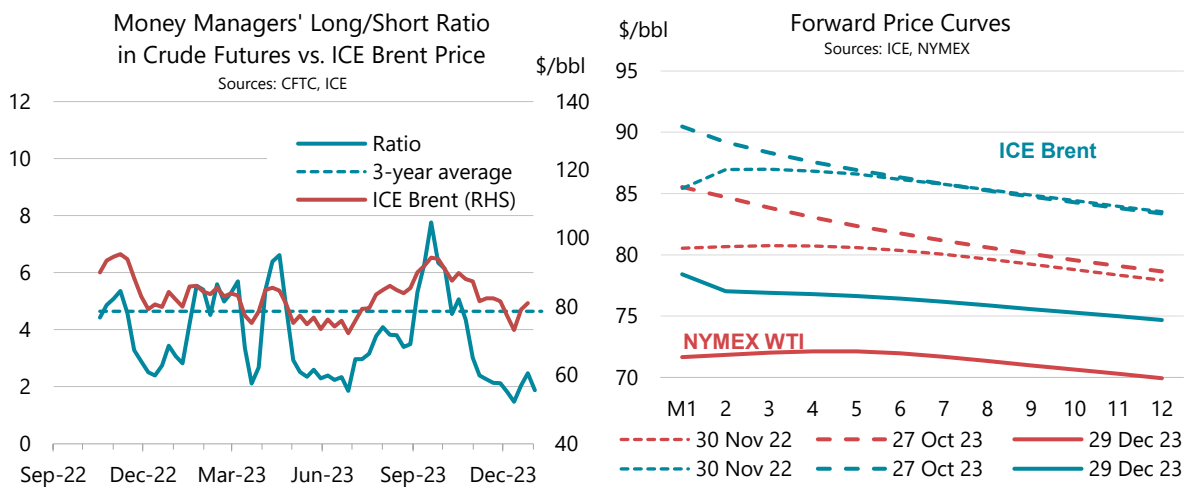
Forward price curves for WTI and Brent were little changed m-o-m at around \$2-3/bbl backwardated for 1-12 months. Time spreads narrowed initially – the 1m-12m WTI spread briefly dipped into contango after nine straight weeks of Cushing inventory builds. The price structure then strongly rebounded as Red Sea shipping disruptions escalated, on the view that longer routes by sailing around Africa would stretch supply chains, thereby delaying flows into the Atlantic Basin. Conversely, the Dubai forward curve weakened, its front-end briefly flipping into contango as Middle Eastern crudes, seeing reduced access to their key Red Sea outlet, were seen at risk of becoming stranded east of Suez.

The RBOB gasoline versus WTI crack was stable, gaining \$1/bbl m-o-m. The margin had recovered steadily since trading at 10-year seasonal lows in October but gave back about \$2/bbl in early

January, after weekly EIA data showed US gasoline inventories building by more than 10 million barrels – their biggest one-week increase in 40 years. Diesel cracks fell \$5/bbl m-o-m but remained near all-time highs, except for 2022.

Speculative selling of crude continued unabated in early December. By mid-month, investment funds had been net sellers of crude in 10 of the most recent 12 weeks, sending the ratio of long-to-short crude future holdings by money managers to 1.5, a multi-year low. Net speculative Brent holdings fell below 100 mb for the first time in 2023 while WTI positions took an even bigger hit, falling to 31 mb, their lowest since the aftermath of the 2007/08 Global Financial Crisis. Sentiment subsequently reversed after the Red Sea attacks prompted a combination of fresh buying and short covering, with Brent holdings doubling to end the year at 200 mb. The long-to-short ratio recovered to 2.5 – still well below the historical average of 4.7.

In December, total open interest in the five main ICE and NYMEX futures contracts was virtually unchanged m-o-m, at 4 780 mb.



Prompt Month Oil Futures Prices
(monthly and weekly averages, \$/bbl)

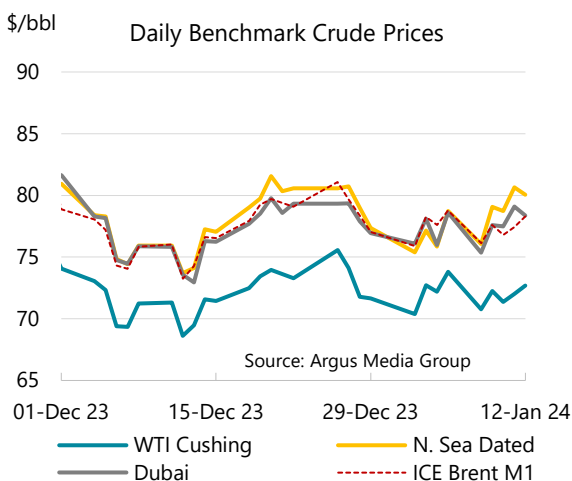
	Dec 2023			Week Commencing:			Last:				
	Oct 2023	Nov 2023	Dec 2023	*Monthly Δ	m-o-m Δ	y-o-y Δ	04 Dec	11 Dec	18 Dec	25 Dec	12 Jan
NYMEX											
Light Sweet Crude Oil (WTI) 1st contract	85.47	77.38	72.12	-4.31	-5.25	-4.39	71.06	70.48	73.52	73.28	72.68
Light Sweet Crude Oil (WTI) 12th contract	78.80	76.06	72.68	3.38	-3.38	-2.50	70.55	70.88	73.32	72.43	70.74
RBOB	95.50	92.50	88.41	-4.08	-4.09	-5.16	86.74	86.55	91.13	89.26	89.05
ULSD	128.80	119.93	110.05	-11.65	-9.88	-21.15	109.26	108.16	113.03	109.22	112.11
ULSD (\$/mmbtu)	23.20	21.60	19.82	-2.10	-1.78	-3.81	19.68	19.48	20.36	19.68	20.20
NYMEX Natural Gas (\$/mmbtu)	3.15	3.06	2.54	-0.29	-0.52	-3.23	2.63	2.39	2.52	2.56	3.31
ICE											
Brent 1st contract	88.70	82.03	77.32	-5.79	-4.71	-4.02	75.88	75.34	79.07	79.04	78.29
Brent 12th; contract	82.85	80.14	76.92	3.11	-3.22	-2.54	74.63	75.07	77.62	77.03	75.21
Gasoil	121.22	111.95	104.01	-6.82	-7.94	-15.27	104.69	100.76	106.33	102.99	105.49
Prompt Month Differentials											
NYMEX WTI - ICE Brent	-3.24	-4.65	-5.20	1.48	-0.55	-0.38	-4.82	-4.86	-5.55	-5.76	-5.61
NYMEX WTI 1st vs. 12th	6.66	1.32	-0.55	-7.69	-1.87	-1.89	0.51	-0.40	0.19	0.84	1.94
ICE Brent 1st - 12th	5.85	1.89	0.41	-8.90	-1.48	-1.48	1.25	0.27	1.45	2.01	3.08
NYMEX ULSD - WTI	43.33	42.55	37.92	-7.34	-4.63	-16.75	38.20	37.68	39.52	35.95	39.43
NYMEX RBOB - WTI	10.04	15.12	16.29	0.23	1.17	-0.76	15.67	16.07	17.62	15.99	16.37
NYMEX 3-2-1 Crack (RBOB)	21.14	24.26	23.50	-2.30	-0.76	-6.09	23.18	23.27	24.92	22.64	24.06
NYMEX ULSD - Natural Gas (\$/mmbtu)	20.05	18.55	17.29	-1.81	-1.26	-0.58	17.06	17.09	17.84	17.12	16.88
ICE Gasoil - ICE Brent	32.52	29.92	26.69	-1.03	-3.24	-11.26	28.81	25.42	27.27	23.95	27.20

Sources: ICE, NYMEX

*Monthly Δ refers to the difference in price between the current and previous end of month.

Spot crude oil prices

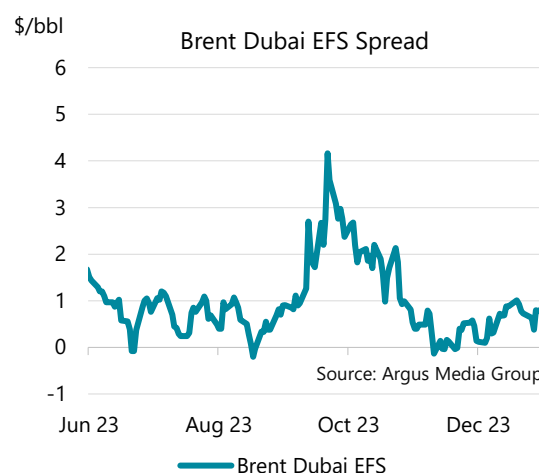
Spot crude oil prices continued their bearish momentum in December, as an overhang in both sweet and sour grades due to soft demand in the East pushed benchmark prices lower. North Sea Dated fell by \$5.21/bbl m-o-m to \$77.85/bbl in the wake of the \$4.71/bbl decline in ICE Brent futures to



\$77.32/bbl. The US marker WTI at Cushing slipped by \$5.35/bbl to \$72.08/bbl, while the Middle East benchmark Dubai posted the sharpest decline, down \$6.10/bbl to \$77.31/bbl. The diminishing physical premium for North Sea Dated versus futures underscored the ample regional sweet crude supply. North Sea Dated versus ICE Brent narrowed to \$0.52/bbl m-o-m, down from \$1.02/bbl in November. However, in early January that spread sharply widened, approaching \$3/bbl, as demand for prompt delivery increased due to escalating tensions in the Red Sea. The

surplus of sour crude showed similar trends, with the forward Dubai structure briefly slipping into contango in mid-December. The Dubai M1 to M3 price curve narrowed (-\$1.40/bbl) from \$1.57/bbl to \$0.17/bbl in December but recovered to a \$0.93/bbl premium in early January.

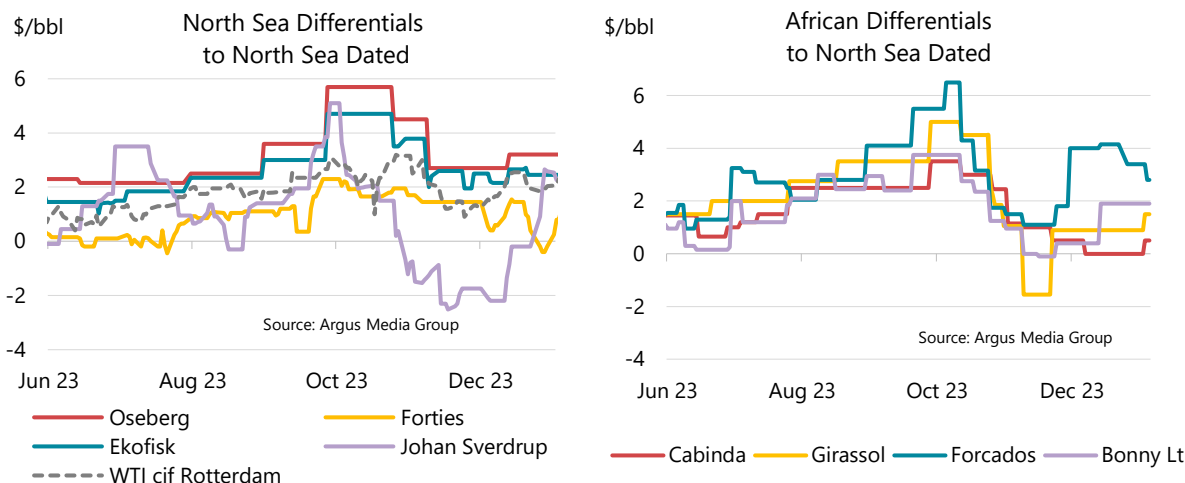
Amidst ample supply in both the Atlantic Basin and the Middle East, refiners have been shifting their focus away from Dubai-linked sour crudes over the past few months, preferring Brent-linked Atlantic Basin grades. The Brent to Dubai EFS, a measure of west-east arbitrage, began to narrow sharply in October and teetered at a discount for a brief period in November as OPEC supply cuts tightened the sour market, bolstering the Dubai complex. This, in turn, pushed refiners towards more Brent-linked crudes. The Brent to Dubai EFS in December widened marginally by \$0.16/bbl to \$0.56/bbl but remained narrower than the October average of \$2.13/bbl. With spring maintenance on the horizon, demand for sour crudes in the East



has been muted. Escalating tensions in the Red Sea have aggravated prompt Atlantic Basin demand to offset delays for delivery of Middle East sour crudes via the Cape instead of the Suez Canal. BP, Equinor, and Maersk each announced a cessation of all shipments from the Red Sea. It is expected that more vessels will avoid the Bab-el-Mandeb Strait and reroute transit. At the time of writing, tanker tracking data showed a marked decline in volumes through the Suez Canal, weighing on the Dubai complex in differentials.

Crude price differentials for North Sea grades against Dated generally declined in December but regained momentum towards the end of the month as Red Sea tensions prompted refineries to seek alternative crude sources to mitigate the impact of increased delivery times via the Cape. Early in the month, an open arbitrage for sour crude to move East elevated the Forties spread, which initially

rose to \$1.45/bbl but ultimately dropped to \$0.40/bbl by the end of the month, giving way to a monthly average of \$1.05/bbl in December. The discount for Johan Sverdrup against North Sea Dated fell by \$0.13/bbl m-o-m to \$1.41/bbl. However, the discount narrowed sharply after the Red Sea tanker attacks, flipping to a three-month high, with a \$2.66/bbl premium in early January, as European refineries sought prompt alternatives to Middle East sour crudes. Similarly, sweeter grades in the basket experienced a decline in premiums early in the month but recovered losses towards the end, influenced by an overhang in December cargoes. Year-end tax strategies prompted traders to deplete inventories on the US Gulf Coast, resulting in a surplus of WTI to Europe, which kept a lid on prices. Ekofisk and Oseberg saw premiums decline to \$2.36/bbl and \$2.86/bbl, respectively (-\$0.70/bbl and -\$0.74/bbl), while WTI CIF Rotterdam dipped to \$1.75/bbl (-\$0.47/bbl).

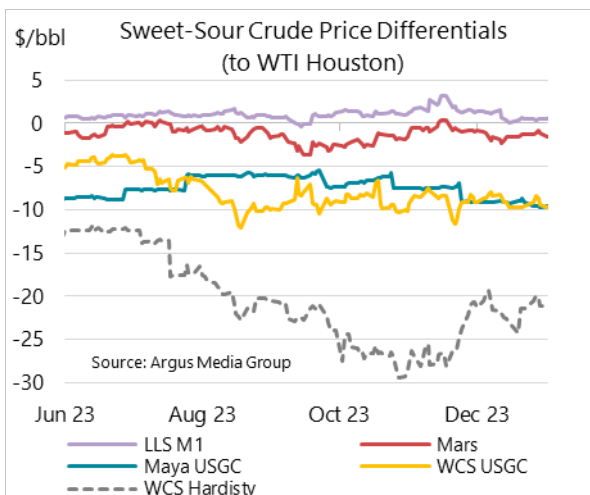
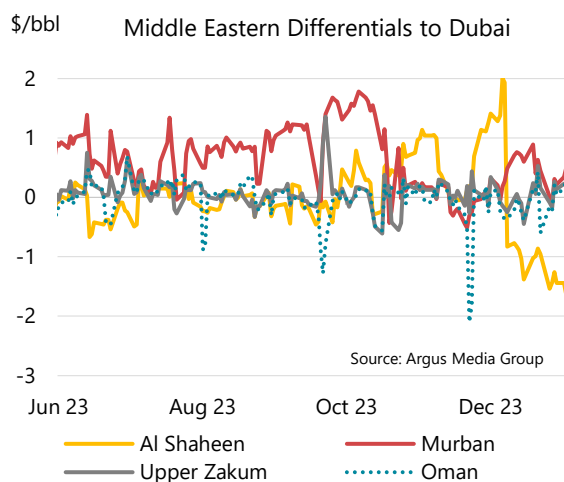
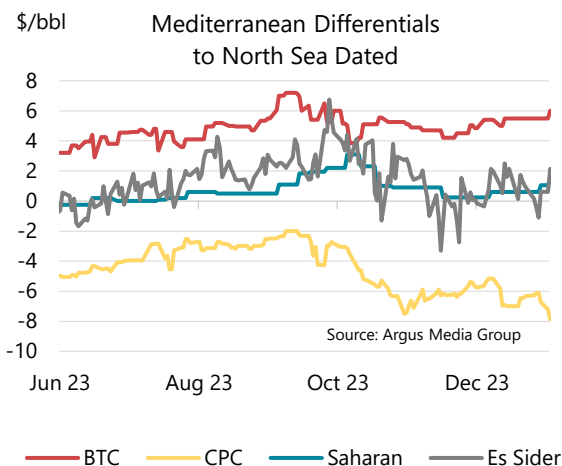


In December, differentials for West African crudes versus North Sea Dated surged as a result of firm interest from European refiners and notably increased purchases from Asian buyers. During the month, Western Africa crude oil exports reached their highest since March 2021, at close to 3.8 mb/d. Spreads against North Sea Dated widened substantially mid-month, partly due to the tensions in the Red Sea. Additionally, the long-awaited Dangote refinery has begun to build inventory, pulling in more than 5 mb of Nigerian crude from December to early January. As a result, Forcados against Dated saw its premium move \$3/bbl higher, ending December at a \$4.15/bbl premium. Brass River moved out of a discount by \$1.08/bbl m-o-m to a \$0.50/bbl premium and jumped \$1.90/bbl by the end of the month. Similarly, Bonny Light was up \$0.28/bbl m-o-m to \$0.79/bbl on average, closing the month at a \$1.90/bbl premium. Qua Iboe increased by a marginal \$0.11/bbl m-o-m to \$1.18/bbl. Despite strong exports, Angolan crudes were under pressure in December due to subdued demand from Chinese refiners and a surplus of WTI. Cabinda fell \$1.17/bbl m-o-m to \$0.24/bbl, slipping gradually throughout the month, while Girassol saw premiums rise \$0.73/bbl m-o-m to \$0.90/bbl.

Mediterranean light sweet crude grades remained attractive to refiners, despite the Atlantic Basin being saturated with WTI. BTC blend was up by \$0.45/bbl to \$5.20/bbl as Suez Canal uncertainties and competition from Asia Pacific buyers eroded availability of the grade. This had a knock-on effect on the comparable grade Es Sider, which has a dedicated European market base. Differentials for the grade flipped from a discount to a \$0.25/bbl premium to Dated (+\$0.64/bbl m-o-m). The spread increased even further to \$0.65/bbl by December 29. At the same time, CPC's discount narrowed by \$0.49/bbl m-o-m to -\$5.97/bbl. Algerian crude Saharan Blend was the only exception, as premiums fell for a second month, down by \$0.29/bbl m-o-m to \$0.43/bbl. Pressure from ample supply of WTI to Europe and limited interest in the East pushed prices lower. Russian Urals prices lost ground in November and continued into December, owing to the rally in freight rates and increased risk premiums following tighter sanction enforcement from the United States. The discount

for Urals FOB Primorsk compared with Dated fell in December by \$2.23/bbl to -\$18.22/bbl m-o-m, while Urals FOB Novorossiysk declined by \$3.95/bbl m-o-m to -\$18.20/bbl. ESPO prices against Dubai were relatively unchanged at an average -\$5.10/bbl (+\$0.25/bbl).

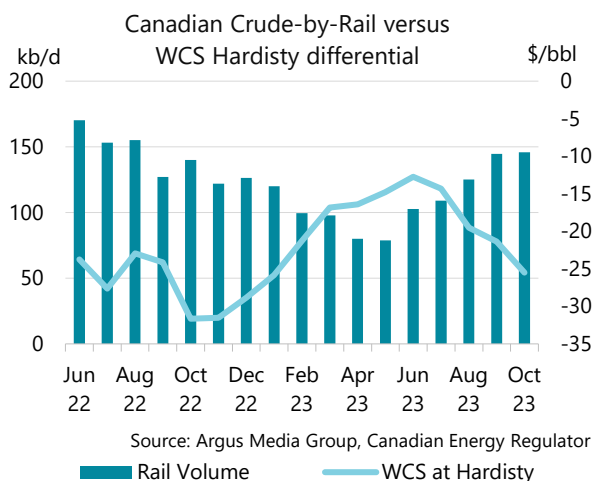
Middle East sour crude differentials relative to Dubai were under pressure in December amid an overhang of crude supplies. Spot cargo pricing for February delivery of medium sour crudes witnessed a significant decline. Sluggish demand from China due to upcoming spring maintenance pushed prices lower. The disruption to the Red Sea shipping routes sent many Atlantic Basin traders looking elsewhere. Increased exports due to maintenance at Oman's Sohar refinery and the UAE's Ruwais refinery added to the glut. Qatari Al-Shaheen crude lost \$0.31/bbl m-o-m versus Dubai, averaging \$0.19/bbl, but quickly lost ground in early January after tensions rose in the Red Sea, with premiums flipping to a discount of -\$1.86/bbl. At the same time, the premium for Upper Zakum fell by \$0.11/bbl m-o-m to just \$0.02/bbl above Dubai. Despite increased availability, UAE light sour Murban rose to a premium of \$0.37/bbl m-o-m against the Dubai benchmark. In November, Murban reached parity with Dubai, flipping into a brief discount, with the lowest price spread since March 2021. As Murban competes favourably with WTI and with spot prices relatively low, it continues to be an attractive option for buyers east of Suez which has supported prices. Differentials for Oman against the benchmark also rose marginally, by \$0.07/bbl m-o-m, bringing the discount up to -\$0.10/bbl.



On the US Gulf Coast, December witnessed robust exports driven by strong domestic production, while simultaneously the region's refiners unwound crude inventories for year-end tax purposes. According to *Kpler*, overall US seaborne exports were 30 kb/d shy of record highs, but at the same time surpassed all-time highs for shipments to Europe. While still wide open, the transatlantic arbitrage represented by WTI Houston to the North Sea Dated second month forward was unchanged at -\$3.62/bbl, maintaining the widest spread since March 2023. Despite the strong exports, Cushing experienced a build-up in storage volumes as Midcontinent refiners could not absorb the excess crude, partly from Western Canada. This pushed the premium for WTI Houston to Cushing to an average of \$1.87/bbl in December (+\$0.70/bbl m-o-m), reaching \$3/bbl in the last

week of the year, the widest in ten months. Similarly, Midland WTI's discount to Houston blew out to \$1.44/bbl (+\$0.49/bbl). Heavy sour crudes were under pressure from growing supplies in the Gulf Coast as Venezuelan, Guyanese, and Colombian crudes continued to move to the region. The discount for Maya against WTI Houston widened by \$1.60/bbl to -\$9.07/bbl, while Mars slid by \$0.55/bbl to -\$1.38/bbl.

WCS's differential to WTI Houston narrowed by \$0.38/bbl to -\$8.93/bbl in Houston and by \$6.24/bbl to -\$19.76/bbl at the Hardisty terminal in Alberta, as Canadian refineries came back online in November after maintenance. Since August, the discount of WCS at Hardisty against WTI Houston has been below \$20/bbl, as the Enbridge pipeline faced significant apportionment amid robust Canadian output resulting in increased crude-by-rail movements. Canadian crude-by-rail exports rose for a fifth consecutive month in October, to its highest level since August 2022 at 146 kb/d. The steep discounts continue to support the viability of crude-by-rail movements that are expected to remain at high levels in coming months until start-up of the TMX pipeline.



Spot Crude Oil Prices and Differentials

(monthly and weekly averages, \$/bbl)

	Dec 2023			Week Commencing:			Last:				
	Oct 2023	Nov 2023	Dec 2023	*Monthly Δ	m-o-m Δ	y-o-y Δ	04 Dec	11 Dec	18 Dec	25 Dec	12 Jan
Crudes											
North Sea Dated	91.12	83.05	77.85	-3.23	-5.21	-2.51	76.38	75.60	80.24	79.03	80.06
North Sea Mth 1	90.62	82.60	77.77	-3.11	-4.84	-3.55	76.60	75.32	79.86	78.94	79.94
North Sea Mth 2	88.78	82.24	77.58	-2.97	-4.67	-3.88	76.31	75.36	79.56	78.83	78.68
WTI (Cushing) Mth 1	85.57	77.44	72.08	-4.31	-5.35	-4.42	71.06	70.48	73.35	73.28	72.68
WTI (Cushing) Mth 2	84.39	77.46	72.34	-4.21	-5.12	-4.28	71.31	70.76	73.69	73.47	72.79
WTI (Houston) Mth 1	86.47	78.61	73.95	-3.91	-4.66	-3.25	72.59	72.08	75.81	75.27	74.61
Urals FOB Primorsk	77.39	67.07	59.63	-4.88	-7.44	16.28	58.46	57.11	61.95	60.39	62.26
Dubai (1st month)	89.81	83.41	77.31	-8.02	-6.10	0.22	76.97	75.11	78.12	78.51	78.95
Differentials to Futures											
North Sea Dated vs. ICE Brent	2.42	1.02	0.52	2.56	-0.50	1.51	0.49	0.26	1.18	-0.01	1.77
WTI (Cushing) Mth1 vs. NYMEX	0.11	0.06	-0.04	0.00	-0.10	-0.02	0.00	0.00	-0.17	0.00	0.00
Differentials to Physical Markers											
WTI (Houston) vs. North Sea Mth 2	-2.31	-3.63	-3.62	-0.94	0.01	0.63	-3.72	-3.29	-3.76	-3.56	-4.08
WTI (Houston) vs. WTI (Cushing)	0.89	1.18	1.87	0.40	0.70	1.17	1.53	1.60	2.46	1.99	1.92
Urals FOB Prim vs. North Sea Dated	-13.73	-15.99	-18.22	-1.65	-2.23	18.79	-17.92	-18.49	-18.29	-18.63	-17.80
Dubai vs. ICE Brent	1.11	1.38	-0.02	-2.23	-1.40	4.35	1.08	-0.22	-0.95	-0.52	0.66
Dubai vs. WTI (Cushing) Mth 2	5.42	5.95	4.96	-3.81	-0.99	4.50	5.66	4.35	4.43	5.05	6.16
Prompt Month Differentials											
Forward North Sea Mth1-Mth2	1.84	0.36	0.19	-0.14	-0.17	0.33	0.30	-0.04	0.29	0.11	1.26
Forward WTI Cushing Mth1-Mth2	1.18	-0.03	-0.26	-0.10	-0.24	-0.14	-0.24	-0.28	-0.34	-0.19	-0.11
Forward Dubai Mth1-Mth2	1.49	0.97	-0.02	-1.30	-0.98	-0.64	0.22	0.02	-0.12	-0.35	0.70

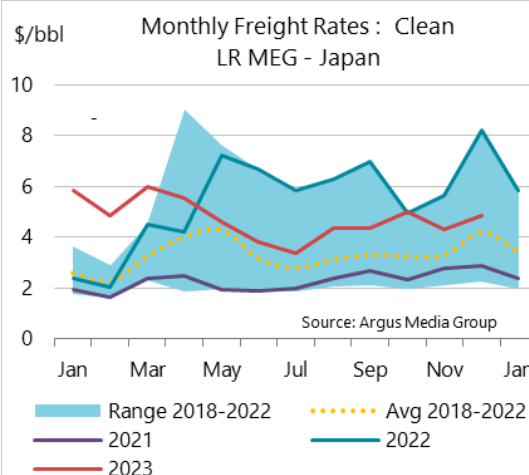
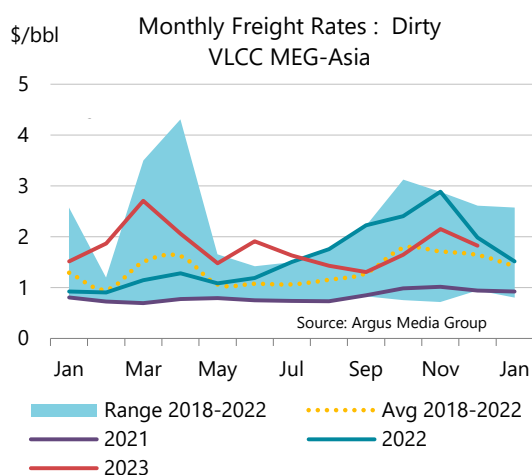
Sources: Argus Media group, ICE, NYMEX

*Monthly Δ refers to the difference in price between the current and previous end of month.

Freight

Throughout December, there was minimal impact on global freight rates from the ongoing tensions in the Red Sea, which now poses a significant risk for charterers navigating the Suez Canal (see *Red Sea tanker attacks raise supply risks via oil choke points*). Dirty tanker rates declined by 15% m-o-m

on average but are trending higher into January. Product tanker rates saw a slight uptick for Long-Range (LR) rates from Middle East to Asia. However, the rise in rates was well below normal seasonal trends.



Dirty rates for VLCC shipments dropped by \$0.33/bbl m-o-m to \$1.82/bbl on average, following a decline from November's peak of \$2.08/bbl. Increased supply of vessels in December, particularly in the Atlantic Basin, and reduced VLCC movements in Asia contributed to the downward pressure on prices. VLCC rates, however, have been supported by an increase in crude movements on large carriers from the US to Europe, which have risen from only marginal volumes in early 2022 to around 500 kb/d currently, or 10% of total US crude exports. Suezmax rates from Western Africa to Europe fell \$0.35/bbl m-o-m to \$2.65/bbl but rose sharply in early January to \$3.45/bbl in the week of 8 January as strong interest in the region tightened tonnage lists. Similarly, freight rates for a Suezmax moving from the USGC to Europe dropped by \$0.71/bbl m-o-m, to \$2.81/bbl in December and rebounded sharply to \$3.92/bbl at the start of the year. Rates for Aframax shipments out of the North Sea slid by \$0.21/bbl m-o-m to \$1.35/bbl in December, with rates moving marginally higher into the first week of January (\$1.52/bbl).

Freight Costs											
(monthly and weekly averages, \$/bbl)											
	Dec-23					Week Commencing					
	Oct 23	Nov 23	Dec 23	m-o-m chg	y-o-y chg	04-Dec	11-Dec	18-Dec	25-Dec	01-Jan	08-Jan
Crude Tankers											
VLCC MEG-Asia	1.65	2.15	1.82	-0.33	-0.16	2.05	1.78	1.70	1.63	1.59	1.87
130Kt WAF - UKC	2.94	3.00	2.65	-0.35	-0.91	2.71	2.59	2.60	2.77	3.06	3.45
130Kt USGC to EUR	3.23	3.53	2.81	-0.71	-0.78	2.79	2.71	2.70	3.10	3.34	3.92
North Sea Aframax	1.27	1.56	1.35	-0.21	-0.70	1.25	1.19	1.45	1.61	1.52	1.54
Product Tankers											
LR MEG - Japan	4.98	4.31	4.86	0.55	-3.36	3.83	4.46	5.66	5.96	5.24	4.79
MR Sing - JPN	3.54	2.49	2.97	0.48	-2.18	2.86	3.09	2.99	3.01	3.06	3.08
MR Carib - US Atlantic	2.75	3.84	4.35	0.51	0.25	5.17	4.62	3.88	3.40	2.75	2.70
MR UK-US Atlantic	3.41	4.07	3.96	-0.12	-2.02	4.06	4.03	3.83	3.67	2.72	2.23

Source: Argus Media Group

Clean tanker rates rose during the month, with the exception of Medium Range (MR) charters from the UK to the US, which fell to \$3.96/bbl (-\$0.12/bbl). LR clean tanker rates for Middle East to Asia increased by \$0.55/bbl m-o-m to \$4.86/bbl, with rates climbing from mid-December due to escalating pressures in the Red Sea. Product tanker rates rose for shipments within Asia, adding \$0.48/bbl m-o-m to \$2.97/bbl. Demand for products tankers in and out of China has been strong ahead of the Chinese lunar New Year. Rates for clean tankers from the Caribbean also rose, to \$4.35/bbl (+\$0.51/bb), the highest on record, buoyed by the persistent backlog through the Panama Canal.

Table 2a
OECD REGIONAL OIL DEMAND¹
(million barrels per day)

	2021	2022	4Q22	1Q23	2Q23	3Q23	Aug 23	Sep 23	Oct 23 ²	Latest month vs.	
										Sep 23	Oct 22
Americas											
LPG and ethane	3.78	3.90	3.93	4.07	3.93	3.89	3.82	3.71	4.25	0.54	0.44
Naphtha	0.26	0.23	0.22	0.22	0.25	0.23	0.21	0.24	0.19	-0.04	-0.02
Motor gasoline	10.26	10.38	10.33	10.15	10.72	10.66	10.95	10.45	10.65	0.20	0.27
Jet and kerosene	1.56	1.84	1.86	1.84	1.97	2.05	2.05	2.00	1.94	-0.06	0.10
Gasoil/diesel oil	4.98	5.17	5.17	5.13	4.97	5.02	5.25	5.06	5.21	0.15	-0.12
Residual fuel oil	0.58	0.57	0.55	0.53	0.44	0.49	0.56	0.44	0.49	0.05	-0.06
Other products	2.86	2.71	2.64	2.52	2.88	3.01	3.07	3.03	2.67	-0.36	0.03
Total	24.28	24.79	24.70	24.46	25.18	25.35	25.92	24.92	25.40	0.48	0.64
Europe											
LPG and ethane	1.09	1.04	0.99	1.10	1.11	1.05	1.09	1.06	0.96	-0.09	0.07
Naphtha	1.16	0.96	0.84	0.97	0.83	0.77	0.74	0.84	0.80	-0.03	-0.01
Motor gasoline	1.93	2.04	2.02	1.98	2.20	2.24	2.25	2.24	2.16	-0.08	0.18
Jet and kerosene	0.86	1.29	1.32	1.26	1.46	1.64	1.64	1.63	1.58	-0.05	0.16
Gasoil/diesel oil	6.29	6.25	6.31	5.98	6.06	5.99	5.82	6.05	6.24	0.20	0.06
Residual fuel oil	0.72	0.78	0.77	0.76	0.73	0.71	0.74	0.69	0.67	-0.02	-0.08
Other products	1.16	1.16	1.11	1.05	1.16	1.22	1.18	1.26	1.22	-0.04	0.04
Total	13.19	13.51	13.35	13.09	13.55	13.62	13.46	13.76	13.64	-0.12	0.42
Asia Oceania											
LPG and ethane	0.76	0.79	0.80	0.90	0.70	0.74	0.77	0.74	0.73	-0.01	0.06
Naphtha	1.97	1.85	1.84	1.94	1.69	1.74	1.77	1.77	1.74	-0.03	0.03
Motor gasoline	1.39	1.44	1.49	1.41	1.43	1.51	1.55	1.48	1.43	-0.05	-0.02
Jet and kerosene	0.60	0.68	0.83	0.94	0.67	0.64	0.64	0.64	0.75	0.12	0.10
Gasoil/diesel oil	1.86	1.87	1.94	1.89	1.84	1.83	1.79	1.83	1.82	-0.01	-0.03
Residual fuel oil	0.45	0.50	0.51	0.54	0.42	0.42	0.40	0.42	0.41	-0.01	-0.05
Other products	0.30	0.24	0.22	0.19	0.19	0.17	0.16	0.16	0.14	-0.01	-0.08
Total	7.34	7.38	7.63	7.81	6.95	7.05	7.07	7.04	7.04	0.00	-0.00
OECD											
LPG and ethane	5.62	5.74	5.71	6.07	5.74	5.68	5.68	5.51	5.95	0.44	0.56
Naphtha	3.39	3.04	2.89	3.13	2.78	2.74	2.72	2.84	2.73	-0.11	-0.01
Motor gasoline	13.58	13.85	13.84	13.54	14.34	14.41	14.75	14.16	14.24	0.08	0.43
Jet and kerosene	3.02	3.81	4.01	4.03	4.10	4.34	4.33	4.27	4.27	0.00	0.36
Gasoil/diesel oil	13.12	13.30	13.42	13.00	12.88	12.83	12.86	12.93	13.27	0.34	-0.09
Residual fuel oil	1.75	1.84	1.83	1.83	1.60	1.62	1.70	1.55	1.57	0.02	-0.19
Other products	4.33	4.11	3.97	3.76	4.23	4.39	4.41	4.45	4.03	-0.42	-0.02
Total	44.81	45.68	45.67	45.36	45.68	46.02	46.45	45.72	46.08	0.36	1.05

¹ Demand, measured as deliveries from refineries and primary stocks, comprises inland deliveries, international bunkers and refinery fuel. It includes crude for direct burning, oil from non-conventional sources and other sources of supply. Jet/kerosene comprises jet kerosene and non-aviation kerosene. Gasoil comprises diesel, light heating oil and other gasoils. Americas comprises US 50 states, US territories, Mexico, Canada and Chile.

² Latest official OECD submissions (MOS).

Table 4
OECD STOCKS AND QUARTERLY STOCK CHANGES

	RECENT MONTHLY STOCKS ²					PRIOR YEARS' STOCKS ²			STOCK CHANGES			
	in Million Barrels					in Million Barrels			in mb/d			
	Jul2023	Aug2023	Sep2023	Oct2023	Nov2023 ³	Nov2020	Nov2021	Nov2022	4Q2022	1Q2023	2Q2023	3Q2023
OECD INDUSTRY-CONTROLLED STOCKS¹												
OECD Americas												
Crude	590.6	570.2	565.8	579.2	597.9	656.7	604.6	575.9	0.17	0.29	-0.17	-0.43
Motor Gasoline	247.6	244.8	256.4	246.3	250.3	271.3	247.4	248.3	0.17	0.03	-0.07	0.10
Middle Distillate	191.8	189.1	192.1	177.9	179.3	225.2	196.8	185.4	0.10	-0.04	0.03	0.09
Residual Fuel Oil	34.2	31.9	34.0	33.2	32.0	38.0	35.2	35.6	0.03	-0.02	0.01	-0.03
Total Products ⁴	768.3	780.0	804.8	772.0	765.5	827.3	745.3	750.0	0.00	-0.30	0.47	0.62
Total⁵	1522.6	1514.2	1539.0	1519.5	1531.0	1658.3	1509.7	1490.6	0.20	-0.03	0.27	0.28
OECD Europe												
Crude	343.0	339.0	330.3	332.2	328.8	360.9	313.2	340.6	0.00	0.02	0.10	-0.19
Motor Gasoline	84.8	86.3	86.2	86.0	86.6	102.0	88.3	87.9	0.00	0.02	-0.10	0.06
Middle Distillate	253.1	261.3	258.0	242.1	233.6	328.2	254.1	241.3	0.17	-0.05	-0.01	0.13
Residual Fuel Oil	63.0	62.6	64.4	62.2	63.8	66.1	60.8	69.1	0.04	-0.03	-0.02	-0.01
Total Products ⁴	509.4	522.8	520.2	502.1	494.5	611.8	500.0	504.5	0.19	-0.14	-0.11	0.26
Total⁵	930.0	940.3	921.9	907.3	894.6	1056.6	886.4	929.5	0.20	-0.19	0.01	0.02
OECD Asia Oceania												
Crude	140.7	122.2	123.0	121.1	126.5	155.5	110.2	129.7	0.00	0.13	-0.07	-0.12
Motor Gasoline	23.4	24.0	24.5	24.4	24.4	25.5	24.5	25.9	0.01	0.00	0.01	-0.01
Middle Distillate	61.0	68.3	70.1	71.8	70.4	71.4	70.2	72.4	0.00	-0.09	0.06	0.11
Residual Fuel Oil	17.7	18.7	18.8	18.2	18.0	16.1	16.0	19.5	0.00	0.00	0.01	0.02
Total Products ⁴	167.5	181.7	178.7	178.4	176.9	178.3	174.8	184.3	-0.04	-0.08	0.11	0.12
Total⁵	367.5	367.9	364.5	361.6	364.1	395.8	345.4	373.5	-0.06	-0.03	0.09	0.06
Total OECD												
Crude	1074.3	1031.4	1019.1	1032.5	1053.2	1173.0	1028.0	1046.2	0.17	0.44	-0.15	-0.74
Motor Gasoline	355.8	355.0	367.0	356.7	361.2	398.8	360.2	362.1	0.18	0.04	-0.16	0.15
Middle Distillate	506.0	518.6	520.1	491.8	483.3	624.8	521.1	499.1	0.27	-0.17	0.08	0.33
Residual Fuel Oil	114.9	113.3	117.2	113.6	113.7	120.3	112.0	124.3	0.07	-0.05	0.00	-0.02
Total Products ⁴	1445.2	1484.4	1503.7	1452.5	1436.8	1617.4	1420.2	1438.8	0.15	-0.52	0.47	1.01
Total⁵	2820.1	2822.4	2825.4	2788.4	2789.7	3110.6	2741.5	2793.6	0.34	-0.25	0.37	0.36
OECD GOVERNMENT-CONTROLLED STOCKS⁶												
OECD Americas												
Crude	347.5	350.3	351.3	351.3	351.8	638.1	601.5	388.4	-0.48	-0.01	-0.26	0.04
Products	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.00	0.00	0.00	0.00
OECD Europe												
Crude	191.1	191.1	191.4	191.7	191.9	207.1	202.4	195.9	-0.01	-0.06	0.02	0.02
Products	279.0	279.5	278.1	276.5	276.6	282.0	275.1	256.2	0.15	0.05	0.09	-0.01
OECD Asia Oceania												
Crude	348.1	349.1	349.2	348.6	349.8	374.5	370.5	346.4	0.01	0.06	0.04	-0.02
Products	35.5	34.8	35.1	35.6	35.7	39.1	38.9	35.9	-0.02	0.00	0.00	-0.01
Total OECD												
Crude	886.6	890.6	891.8	891.6	893.5	1219.7	1174.3	930.7	-0.49	-0.01	-0.21	0.04
Products	316.4	316.3	315.2	314.0	314.2	323.0	316.1	294.0	0.13	0.04	0.09	-0.01
Total⁵	1205.2	1209.1	1208.9	1207.7	1209.8	1544.7	1492.3	1226.1	-0.35	0.03	-0.12	0.03

1 Stocks are primary national territory stocks on land (excluding utility stocks and including pipeline and entropot stocks where known) and include stocks held by industry to meet IEA, EU and national emergency reserve commitments and are subject to government control in emergencies.

2 Closing stock levels.

3 Estimated.

4 Total products includes gasoline, middle distillates, fuel oil and other products.

5 Total includes NGLs, refinery feedstocks, additives/oxygenates and other hydrocarbons.

6 Includes government-owned stocks and stock holding organisation stocks held for emergency purposes.

Table 5
TOTAL STOCKS ON LAND IN OECD COUNTRIES¹
(millions of barrels¹ and days²)

	End September 2022		End December 2022		End March 2023		End June 2023		End September 2023 ³	
	Stock Level	Days Fwd ² Demand	Stock Level	Days Fwd Demand	Stock Level	Days Fwd Demand	Stock Level	Days Fwd Demand	Stock Level	Days Fwd Demand
OECD Americas										
Canada	188.1	76	199.8	86	188.3	76	180.0	68	185.4	-
Chile	10.6	29	10.6	28	10.8	29	10.9	29	11.3	-
Mexico	36.7	20	36.6	20	37.3	20	35.8	19	36.7	-
United States ⁴	1634.0	82	1596.6	81	1603.5	79	1613.6	79	1636.7	-
Total⁴	1891.4	77	1865.7	76	1862.0	74	1862.3	73	1892.3	76
OECD Asia Oceania										
Australia	35.8	32	38.7	35	39.8	35	38.9	35	39.8	-
Israel	-	-	-	-	-	-	-	-	-	-
Japan	522.4	146	513.9	138	492.5	159	510.7	165	520.8	-
Korea	174.5	69	173.8	68	196.0	84	190.8	78	182.5	-
New Zealand	5.7	33	5.5	36	5.8	38	5.4	38	5.5	-
Total	738.4	97	731.8	94	734.0	106	745.8	106	748.7	100
OECD Europe⁵										
Austria	17.4	72	21.3	91	22.6	91	22.0	89	22.2	-
Belgium	45.4	77	45.7	73	45.5	77	46.9	84	48.5	-
Czech Republic	22.6	105	23.1	116	23.6	113	22.0	98	23.4	-
Denmark	21.1	142	23.6	167	22.8	149	21.8	134	21.7	-
Estonia	2.3	80	3.4	120	3.2	110	3.0	95	2.5	-
Finland	40.4	219	38.0	222	35.9	198	36.4	223	35.1	-
France	142.3	97	151.3	99	138.7	89	151.8	96	154.7	-
Germany	265.6	125	271.7	132	264.3	126	264.8	131	261.9	-
Greece	30.4	97	31.9	118	32.1	107	31.6	93	32.6	-
Hungary	28.6	172	28.7	177	30.5	172	30.7	167	30.4	-
Ireland	10.3	65	11.0	70	10.3	67	10.3	71	10.2	-
Italy	123.3	104	120.0	106	122.9	104	117.7	96	123.8	-
Latvia	2.8	82	2.9	89	1.9	55	3.0	77	3.0	-
Lithuania	8.2	115	8.3	133	8.7	122	8.5	117	8.4	-
Luxembourg	0.6	14	0.5	11	0.5	10	0.5	11	0.5	-
Netherlands	125.2	141	139.8	155	130.1	142	126.3	145	119.2	-
Norway	28.0	128	27.2	123	27.8	115	26.1	120	27.7	-
Poland	82.1	116	83.8	128	88.5	125	87.5	117	84.2	-
Portugal	21.1	103	20.0	91	18.9	86	19.1	89	20.1	-
Slovak Republic	13.5	141	13.1	141	13.5	146	13.5	142	13.8	-
Slovenia	4.5	85	4.9	100	4.5	92	4.7	102	5.3	-
Spain	111.5	87	109.5	87	110.2	88	112.9	88	113.3	-
Sweden	34.5	118	36.0	121	36.9	121	39.2	137	38.3	-
Switzerland	28.2	140	27.4	145	28.4	144	29.0	154	30.3	-
Republic of Türkiye	86.6	83	88.6	92	87.9	82	93.9	77	91.2	-
United Kingdom	71.1	52	65.9	47	69.6	48	66.9	48	71.2	-
Total	1365.8	102	1397.5	107	1379.7	102	1390.2	102	1393.3	104
Total OECD	3995.6	87	3995.0	88	3975.7	87	3998.2	87	4034.3	88
DAYS OF IEA Net Imports⁶ -	242	-	242	-	243	-	143	-	144	-

1 Total Stocks are industry and government-controlled stocks (see breakdown in the table below). Stocks are primary national territory stocks on land (excluding utility stocks and including pipeline and entropot stocks where known) they include stocks held by industry to meet IEA, EU and national emergency reserves commitments and are subject to government control in emergencies.

2 Note that days of forward demand represent the stock level divided by the forward quarter average daily demand and is very different from the days of net imports used for the calculation of IEA Emergency Reserves.

3 End September 2023 forward demand figures are IEA Secretariat forecasts.

4 US figures exclude US territories. Total includes US territories.

5 Data not available for Iceland.

6 Reflects stock levels and prior calendar year's net imports adjusted according to IEA emergency reserve definitions (see www.iea.org/hetimports.asp). Net exporting IEA countries are excluded.

TOTAL OECD STOCKS

CLOSING STOCKS	Total	Government ¹ controlled		Industry	Total	Government ¹ controlled	
		Millions of Barrels				Days of Fwd. Demand ²	
3Q2020	4732	1551		3181	110	36	74
4Q2020	4578	1541		3037	108	36	71
1Q2021	4470	1546		2924	102	35	66
2Q2021	4405	1524		2882	96	33	63
3Q2021	4281	1513		2769	91	32	59
4Q2021	4136	1484		2652	90	32	58
1Q2022	4057	1442		2615	90	32	58
2Q2022	4008	1343		2664	87	29	58
3Q2022	3996	1246		2750	87	27	60
4Q2022	3995	1214		2781	88	27	61
1Q2023	3976	1217		2759	87	27	60
2Q2023	3998	1206		2792	87	26	61
3Q2023	4034	1209		2825	88	26	62

1 Includes government-owned stocks and stock holding organisation stocks held for emergency purposes.

2 Days of forward demand calculated using actual demand except in 3Q2023 (where latest forecasts are used).

Table 6
IEA MEMBER COUNTRY DESTINATIONS OF SELECTED CRUDE STREAMS¹
(million barrels per day)

	2020	2021	2022	4Q22	1Q23	2Q23	3Q23	Aug 23	Sep 23	Oct 23	Year Earlier	
											Oct 22	change
Saudi Light & Extra Light												
Americas	0.26	0.34	0.46	0.41	0.39	0.39	0.24	0.39	0.03	-	0.35	-
Europe	0.59	0.48	0.62	0.67	0.73	0.67	0.47	0.50	0.45	0.40	0.57	-0.17
Asia Oceania	1.39	1.30	1.51	1.58	1.58	1.43	1.39	1.28	1.53	1.32	1.48	-0.15
Saudi Medium												
Americas	0.14	0.01	-	-	-	-	-	-	-	-	-	-
Europe	0.02	0.01	0.02	0.01	0.01	-	0.01	-	-	-	0.00	-
Asia Oceania	0.25	0.21	0.23	0.23	0.25	0.16	0.24	0.33	0.18	0.18	0.17	0.01
Canada Heavy												
Americas	2.39	2.59	2.61	2.63	2.70	2.57	2.56	2.47	2.76	2.31	2.72	-0.41
Europe	0.03	0.03	0.08	0.11	0.07	0.14	0.10	0.13	0.06	0.11	0.11	0.00
Asia Oceania	0.00	0.02	0.01	-	-	-	-	-	-	-	-	-
Iraqi Basrah Light²												
Americas	0.11	0.08	0.21	0.13	0.33	0.18	0.22	0.34	0.14	0.14	0.19	-0.05
Europe	0.58	0.62	0.69	0.69	0.71	0.75	0.82	0.79	0.89	1.02	0.64	0.38
Asia Oceania	0.22	0.17	0.23	0.26	0.27	0.26	0.23	0.25	0.23	0.29	0.22	0.07
Kuwait Blend												
Americas	-	-	-	-	-	-	-	-	-	-	-	-
Europe	0.04	-	-	-	-	-	-	-	-	0.02	-	-
Asia Oceania	0.55	0.48	0.48	0.46	0.51	0.45	0.47	0.41	0.51	0.35	0.41	-0.06
Iranian Light												
Americas	-	-	-	-	-	-	-	-	-	-	-	-
Europe	-	-	-	-	-	-	-	-	-	-	-	-
Asia Oceania	-	-	-	-	-	-	-	-	-	-	-	-
Iranian Heavy³												
Americas	-	-	-	-	-	-	-	-	-	-	-	-
Europe	-	-	-	-	-	-	-	-	-	-	-	-
Asia Oceania	-	-	-	-	-	-	-	-	-	-	-	-
BFOE												
Americas	-	0.00	-	-	-	-	0.01	-	-	0.01	-	-
Europe	0.42	0.36	0.41	0.38	0.50	0.47	0.54	0.49	0.59	0.35	0.35	0.00
Asia Oceania	0.03	0.05	0.03	-	-	-	-	-	-	0.04	-	-
Kazakhstan												
Americas	-	0.01	-	-	-	-	-	-	-	-	-	-
Europe	0.74	0.69	0.73	0.70	0.98	0.97	0.88	0.92	0.78	0.89	0.55	0.34
Asia Oceania	0.07	0.09	0.13	0.14	0.15	0.14	0.08	0.07	0.03	0.07	0.11	-0.04
Venezuelan 22 API and heavier												
Americas	-	-	-	-	-	0.03	0.06	0.09	-	0.12	-	-
Europe	0.04	-	0.01	0.02	0.01	0.02	0.03	0.03	0.01	0.01	-	-
Asia Oceania	-	-	-	-	-	-	-	-	-	-	-	-
Mexican Maya												
Americas	0.48	0.40	0.40	0.36	0.43	0.38	0.40	0.39	0.44	0.42	0.46	-0.04
Europe	0.16	0.14	0.10	0.12	0.09	0.10	0.07	0.08	0.09	0.03	0.10	-0.06
Asia Oceania	0.12	0.14	0.06	0.08	0.05	0.05	0.05	-	0.10	0.03	0.10	-0.06
Russian Urals												
Americas	-	-	-	-	-	-	-	-	-	-	-	-
Europe	1.12	1.05	0.74	0.40	0.13	0.09	0.09	0.09	0.08	0.08	0.50	-0.42
Asia Oceania	-	0.01	-	-	-	-	-	-	-	-	-	-
Cabinda and Other Angola												
North America	0.01	-	0.00	-	-	-	-	-	-	-	-	-
Europe	0.12	0.03	0.23	0.31	0.35	0.22	0.30	0.37	0.35	0.22	0.28	-0.06
Pacific	-	-	0.00	0.01	-	-	-	-	-	-	0.03	-
Nigerian Light⁴												
Americas	-	0.02	0.00	-	-	-	-	-	-	-	-	-
Europe	0.49	0.41	0.41	0.46	0.53	0.43	0.44	0.51	0.34	0.55	0.23	0.32
Asia Oceania	0.02	0.01	0.01	0.02	0.00	0.00	-	-	-	0.03	0.02	0.01
Libya Light and Medium												
Americas	-	0.02	-	-	-	-	-	-	-	-	-	-
Europe	0.19	0.80	0.63	0.76	0.65	0.76	0.79	0.80	0.64	0.79	0.86	-0.07
Asia Oceania	0.01	0.02	0.01	0.01	0.02	0.00	0.01	0.02	-	0.02	-	-

¹ Data based on monthly submissions from IEA countries to the crude oil import register (in '000 bbl), subject to availability. May differ from Table 8 of the Report. IEA Americas includes United States and Canada. IEA Europe includes all countries in OECD Europe except Estonia, Hungary, Slovenia and Latvia. IEA Asia Oceania includes Australia, New Zealand, Korea and Japan.

² Iraqi Total minus Kirkuk.

³ Iranian Total minus Iranian Light.

⁴ 33° API and lighter (e.g., Bonny Light, Escravos, Qua Iboe and Oso Condensate).

Table 7
REGIONAL OECD IMPORTS^{1,2}
(thousand barrels per day)

	2020	2021	2022	4Q22	1Q23	2Q23	3Q23	Aug 23	Sep 23	Oct 23	Year Earlier	
											Oct 22	% change
Crude Oil												
Americas	1895	2077	2116	2129	2105	2182	2406	2599	2364	1892	1969	-4%
Europe	8349	8520	9090	8986	8368	8337	8679	8848	8838	8753	8627	1%
Asia Oceania	5579	5526	5878	5731	5934	5407	5487	5051	5812	5479	5370	2%
Total OECD	15823	16123	17084	16846	16408	15926	16573	16498	17014	16125	15966	1%
LPG												
Americas	28	21	25	18	31	23	25	21	32	22	14	59%
Europe	422	404	525	578	543	538	512	540	515	475	564	-16%
Asia Oceania	559	562	579	538	677	486	504	586	410	466	490	-5%
Total OECD	1009	987	1130	1134	1251	1048	1042	1146	956	962	1067	-10%
Naphtha												
Americas	7	8	7	8	5	14	5	5	2	1	2	-46%
Europe	409	513	306	195	176	134	158	171	111	224	231	-3%
Asia Oceania	1003	1146	1046	1074	1118	933	1021	1116	1050	1073	1088	-1%
Total OECD	1419	1667	1359	1277	1298	1082	1183	1292	1163	1299	1321	-2%
Gasoline³												
Americas	576	805	675	590	548	988	874	912	877	741	579	28%
Europe	109	106	101	69	63	53	56	56	49	57	82	-31%
Asia Oceania	116	153	176	179	197	196	190	201	161	203	184	10%
Total OECD	800	1064	953	838	808	1237	1120	1169	1087	1001	845	18%
Jet & Kerosene												
Americas	159	165	134	177	178	160	136	111	130	131	163	-20%
Europe	337	329	453	536	383	478	605	585	606	542	599	-9%
Asia Oceania	60	69	87	139	161	113	128	110	161	152	121	26%
Total OECD	556	563	674	852	722	751	869	805	897	824	882	-7%
Gasoil/Diesel												
Americas	134	197	99	120	158	59	51	50	58	92	50	84%
Europe	1192	1188	1225	1486	1164	1261	1053	992	949	799	1500	-47%
Asia Oceania	328	349	319	325	336	384	424	416	380	292	298	-2%
Total OECD	1654	1735	1644	1931	1658	1705	1528	1458	1387	1183	1849	-36%
Heavy Fuel Oil												
Americas	143	102	122	132	105	51	59	57	91	73	118	-39%
Europe	295	374	260	241	146	158	124	119	84	137	277	-51%
Asia Oceania	88	119	89	75	107	86	131	120	153	129	90	44%
Total OECD	526	594	470	448	358	295	314	296	328	339	486	-30%
Other Products												
Americas	592	581	498	457	473	477	411	379	384	417	496	-16%
Europe	574	605	629	605	561	615	630	649	603	490	604	-19%
Asia Oceania	207	199	189	188	167	193	182	193	188	141	206	-32%
Total OECD	1373	1386	1316	1250	1201	1285	1222	1221	1175	1048	1307	-20%
Total Products												
Americas	1639	1879	1560	1502	1499	1772	1560	1534	1573	1476	1422	4%
Europe	3339	3518	3500	3711	3035	3238	3137	3111	2916	2724	3857	-29%
Asia Oceania	2360	2598	2486	2517	2761	2391	2580	2742	2504	2456	2477	-1%
Total OECD	7339	7995	7546	7730	7295	7401	7277	7387	6994	6656	7756	-14%
Total Oil												
Americas	3535	3957	3676	3632	3604	3954	3967	4133	3937	3368	3391	-1%
Europe	11688	12037	12590	12697	11403	11574	11816	11959	11754	11478	12485	-8%
Asia Oceania	7939	8124	8363	8247	8696	7799	8067	7792	8317	7935	7847	1%
Total OECD	23162	24119	24630	24576	23703	23327	23850	23885	24008	22781	23722	-4%

1 Based on Monthly Oil Questionnaire data submitted by OECD countries in tonnes and converted to barrels conversion factors available at <https://www.iea.org/articles/oil-market-report-glossary#a>.

2 Excludes intra-regional trade.

3 Includes additives.

Table 7a
REGIONAL OECD IMPORTS FROM NON-OECD COUNTRIES^{1,2}
(thousand barrels per day)

	2020	2021	2022	4Q22	1Q23	2Q23	3Q23	Aug 23	Sep 23	Oct 23	Year Earlier	
											Oct 22	% change
Crude Oil												
Americas	1835	1982	2049	2057	2053	2110	2358	2575	2296	1859	1895	-2%
Europe	7115	7265	7523	7251	6564	6441	6511	6573	6650	6701	7036	-5%
Asia Oceania	5051	4917	5299	5089	5380	4920	5028	4761	5303	4798	4697	2%
Total OECD	14002	14164	14872	14398	13998	13472	13897	13909	14248	13358	13628	-2%
LPG												
Americas	22	20	25	18	31	23	25	21	32	22	14	59%
Europe	252	243	256	283	263	275	246	246	239	224	276	-19%
Asia Oceania	58	46	62	52	50	34	24	20	25	14	46	-70%
Total OECD	331	309	343	353	345	332	295	286	296	259	336	-23%
Naphtha												
Americas	1	4	3	6	3	6	3	1	1	1	0	7744%
Europe	390	426	272	194	162	103	136	137	91	197	228	-13%
Asia Oceania	832	974	945	958	1047	889	959	1072	940	993	975	2%
Total OECD	1223	1404	1220	1158	1212	998	1098	1211	1032	1191	1203	-1%
Gasoline³												
Americas	195	248	174	137	155	329	279	259	291	264	104	154%
Europe	104	100	84	58	49	38	40	38	30	31	68	-55%
Asia Oceania	98	149	176	179	197	196	190	201	161	203	184	10%
Total OECD	397	497	434	374	400	562	509	498	483	497	356	40%
Jet & Kerosene												
Americas	55	63	48	89	91	60	66	39	74	20	104	-80%
Europe	297	294	393	423	370	423	506	497	456	486	455	7%
Asia Oceania	60	69	87	139	161	113	128	110	161	152	120	26%
Total OECD	413	426	528	650	622	597	701	645	691	658	680	-3%
Gasoil/Diesel												
Americas	103	134	43	48	98	39	40	43	41	17	4	310%
Europe	1062	1107	1120	1315	1008	1021	852	805	842	716	1359	-47%
Asia Oceania	323	349	319	325	336	384	424	415	380	292	298	-2%
Total OECD	1488	1591	1482	1688	1441	1444	1316	1263	1263	1025	1661	-38%
Heavy Fuel Oil												
Americas	110	86	90	96	86	38	54	57	91	38	92	-58%
Europe	279	347	239	220	126	133	103	82	64	72	261	-72%
Asia Oceania	88	119	89	75	107	86	131	120	153	129	90	44%
Total OECD	477	552	418	390	318	257	288	259	308	240	443	-46%
Other Products												
Americas	514	530	421	360	385	421	317	287	284	344	385	-11%
Europe	352	427	443	415	314	365	413	402	361	358	440	-19%
Asia Oceania	130	121	116	116	101	105	110	101	128	90	116	-23%
Total OECD	996	1078	980	890	800	890	840	790	774	792	942	-16%
Total Products												
Americas	1001	1086	804	754	848	917	784	707	814	706	703	1%
Europe	2735	2944	2806	2907	2291	2357	2296	2207	2083	2084	3087	-32%
Asia Oceania	1590	1827	1794	1843	1999	1807	1966	2039	1949	1873	1830	2%
Total OECD	5326	5857	5404	5504	5138	5081	5046	4953	4846	4664	5619	-17%
Total Oil												
Americas	2836	3068	2853	2811	2901	3027	3143	3282	3110	2566	2598	-1%
Europe	9850	10209	10330	10158	8855	8799	8806	8780	8732	8785	10123	-13%
Asia Oceania	6641	6744	7094	6933	7379	6727	6994	6800	7252	6671	6527	2%
Total OECD	19327	20020	20277	19902	19135	18553	18943	18862	19094	18022	19248	-6%

1 Based on Monthly Oil Questionnaire data submitted by OECD countries in tonnes and converted to barrels conversion factors available at <https://www.iea.org/articles/oil-market-report-glossary#a>.

2 Excludes intra-regional trade.

3 Includes additives.

Table 7b
INTER-REGIONAL OECD TRANSFERS^{1,2}
(thousand barrels per day)

	2020	2021	2022	4Q22	1Q23	2Q23	3Q23	Aug 23	Sep 23	Oct 23	Year Earlier	
											Oct 22	% change
Crude Oil												
Americas	60	95	66	72	52	71	48	25	68	33	74	-55%
Europe	1234	1255	1567	1735	1804	1895	2169	2275	2188	2053	1591	29%
Asia Oceania	527	610	578	641	554	487	459	289	510	681	673	1%
Total OECD	1821	1959	2212	2448	2410	2454	2676	2589	2766	2767	2338	18%
LPG												
Americas	6	1	1	0	0	0	0	0	0	0	0	na
Europe	171	161	269	296	280	264	267	294	276	251	288	-13%
Asia Oceania	501	516	517	486	626	452	480	566	384	452	444	2%
Total OECD	678	678	787	782	906	716	747	860	660	703	731	-4%
Naphtha												
Americas	6	4	3	2	2	8	2	4	1	0	2	-100%
Europe	20	87	35	1	14	31	21	34	20	27	3	830%
Asia Oceania	170	172	101	115	70	44	62	44	110	80	113	-29%
Total OECD	196	263	139	119	86	83	85	82	131	108	118	-9%
Gasoline³												
Americas	381	557	501	452	394	660	595	653	585	477	475	1%
Europe	5	6	17	11	15	15	16	18	19	26	14	88%
Asia Oceania	18	5	0	0	0	0	0	0	0	0	0	39%
Total OECD	403	567	518	464	408	675	611	670	604	503	489	3%
Jet & Kerosene												
Americas	103	102	87	88	87	99	69	72	57	110	59	86%
Europe	40	35	60	114	12	54	99	88	150	56	143	-61%
Asia Oceania	0	0	0	0	0	0	0	0	0	0	0	na
Total OECD	144	137	147	202	100	154	168	160	207	166	203	-18%
Gasoi/Diesel												
Americas	31	63	56	72	61	20	11	7	17	75	46	64%
Europe	131	81	106	171	156	241	201	187	107	83	142	-42%
Asia Oceania	4	0	0	0	0	0	0	0	0	0	0	na
Total OECD	166	144	162	243	217	261	212	194	124	158	187	-16%
Heavy Fuel Oil												
Americas	33	16	31	35	20	12	5	0	0	34	26	31%
Europe	16	27	21	22	21	26	21	37	20	64	17	289%
Asia Oceania	0	0	0	0	0	0	0	0	0	0	0	-100%
Total OECD	49	42	52	57	40	38	26	37	20	99	43	129%
Other Products												
Americas	78	51	78	98	88	56	94	92	100	73	111	-34%
Europe	222	178	186	190	247	250	217	246	242	133	164	-19%
Asia Oceania	77	78	73	71	66	88	72	92	60	51	90	-43%
Total OECD	377	307	336	359	401	394	383	431	402	256	365	-30%
Total Products												
Americas	639	794	756	748	650	855	776	827	759	769	719	7%
Europe	604	574	694	805	744	881	841	904	834	640	770	-17%
Asia Oceania	770	771	691	673	763	584	615	702	555	583	647	-10%
Total OECD	2013	2139	2141	2226	2158	2320	2232	2434	2148	1993	2137	-7%
Total Oil												
Americas	699	889	823	820	702	927	824	852	827	803	793	1%
Europe	1838	1829	2261	2539	2548	2776	3010	3179	3022	2693	2361	14%
Asia Oceania	1297	1381	1270	1314	1317	1072	1073	992	1065	1264	1320	-4%
Total OECD	3834	4098	4353	4674	4568	4774	4907	5023	4914	4760	4475	6%

1 Based on Monthly Oil Questionnaire data submitted by OECD countries in tonnes and converted to barrels conversion factors available at <https://www.iea.org/articles/oil-market-report-glossary#>.

2 Excludes intra-regional trade.

3 Includes additives.

Table 9
REGIONAL OECD GASOLINE IMPORTS BY SOURCE¹
(thousand barrels per day)

	2020	2021	2022	4Q22	1Q23	2Q23	3Q23	Aug 23	Sep 23	Oct 23	Year Earlier		
											Oct 22	change	
OECD Americas													
Venezuela	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Central & South America	40	41	45	62	49	65	56	38	84	61	12	49	
ARA (Belgium Germany Netherlands)	148	194	170	100	97	216	214	247	174	109	111	-1	
Other Europe	213	327	293	320	259	389	337	368	346	336	334	2	
FSU	56	83	8	-	-	-	0	0	-	-	-	-	
Saudi Arabia	6	24	27	20	8	33	37	42	34	2	18	-15	
Algeria	4	1	1	1	-	21	12	14	1	-	-	-	
Other Middle East & Africa	13	13	14	13	15	20	20	21	28	17	17	-1	
Singapore	1	4	2	2	10	29	38	29	50	49	-	-	
OECD Asia Oceania	21	37	38	32	38	63	47	38	67	35	31	5	
Non-OECD Asia (excl. Singapore)	72	81	76	38	71	153	115	115	92	132	57	75	
Other	-	0	0	0	-	-	-	-	-	-	-	-	
Total²	576	805	675	590	548	988	874	912	877	741	579	162	
of which Non-OECD	195	248	174	137	155	329	279	259	291	264	104	160	
OECD Europe													
OECD Americas	3	5	16	11	11	14	15	18	16	26	14	12	
Venezuela	0	2	2	2	3	2	1	-	1	1	5	-4	
Other Central & South America	4	7	10	6	7	6	3	5	2	1	6	-6	
Non-OECD Europe	16	10	8	6	8	9	9	6	12	14	5	9	
FSU	31	8	9	2	7	1	1	0	1	2	2	0	
Saudi Arabia	8	3	1	-	0	-	4	1	1	-	-	-	
Algeria	1	-	6	4	7	2	5	6	-	6	10	-4	
Other Middle East & Africa	3	5	8	5	5	5	4	3	5	2	3	-1	
Singapore	2	0	2	3	2	3	4	4	6	4	1	2	
OECD Asia Oceania	1	1	1	1	4	1	1	-	2	0	-	-	
Non-OECD Asia (excl. Singapore)	0	3	3	3	3	4	4	9	-	0	7	-7	
Other	37	63	36	26	8	6	6	5	3	2	28	-26	
Total²	107	106	101	69	63	53	56	56	49	57	82	-25	
of which Non-OECD	104	100	84	58	49	38	40	38	30	31	68	-37	
OECD Asia Oceania													
OECD Americas	4	1	0	0	0	0	0	0	0	0	0	0	
Venezuela	-	-	-	-	-	-	-	-	-	-	-	-	
Other Central & South America	-	-	-	-	-	0	-	-	-	-	-	-	
ARA (Belgium Germany Netherlands)	4	4	0	0	0	0	0	0	0	0	0	0	
Other Europe	10	0	0	0	0	0	0	0	0	0	0	0	
FSU	0	-	-	-	-	-	-	-	-	-	-	-	
Saudi Arabia	-	-	-	-	-	4	-	-	-	-	-	-	
Algeria	-	-	-	-	-	-	-	-	-	-	-	-	
Other Middle East & Africa	1	-	-	-	-	-	0	0	-	-	-	-	
Singapore	51	100	126	125	141	123	105	105	83	118	111	7	
Non-OECD Asia (excl. Singapore)	37	29	30	27	38	53	63	80	46	69	26	42	
Other	9	20	21	27	17	17	21	16	32	16	47	-31	
Total²	116	153	176	179	197	196	190	201	161	203	184	19	
of which Non-OECD	98	149	176	179	197	196	190	201	161	203	184	19	
Total OECD Trade²	798	1064	953	838	808	1237	1120	1169	1087	1001	845	156	
of which Non-OECD	397	497	434	374	400	562	509	498	483	497	356	141	

¹ Based on Monthly Oil Questionnaire data submitted by OECD countries in tonnes.

² Total figure excludes intra-regional trade.

Table 10
REGIONAL OECD GASOIL/DIESEL IMPORTS BY SOURCE¹
(thousand barrels per day)

	2020	2021	2022	4Q22	1Q23	2Q23	3Q23	Aug 23	Sep 23	Oct 23	Year Earlier		
											Oct 22	change	
OECD Americas													
Venezuela	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Central and South America	34	28	6	3	15	17	29	14	37	9	4	5	
ARA (Belgium Germany Netherlands)	11	34	15	11	3	1	1	2	2	4	1	3	
Other Europe	4	5	2	3	0	0	1	0	-	-	0	-	
FSU	12	25	6	-	-	1	-	-	-	-	-	-	
Saudi Arabia	8	15	9	5	9	-	-	-	-	-	-	-	
Algeria	-	-	-	-	-	-	-	-	-	-	-	-	
Other Middle East and Africa	9	25	4	8	7	8	1	-	-	-	-	-	
Singapore	-	2	1	2	3	-	2	6	-	6	-	-	
OECD Asia Oceania	16	25	39	58	57	19	9	5	15	70	44	26	
Non-OECD Asia (excl. Singapore)	34	27	5	17	52	12	9	22	4	1	-	-	
Other	6	12	11	13	12	-	-	-	-	-	-	-	
Total²	134	197	99	120	158	59	51	50	58	92	50	42	
of which Non-OECD	103	134	43	48	98	39	40	43	41	17	4	13	
OECD Europe													
OECD Americas	99	38	76	126	126	214	184	170	101	58	92	-34	
Venezuela	-	-	-	-	-	-	-	-	-	-	-	-	
Other Central and South America	3	1	1	0	-	-	0	1	0	7	0	7	
Non-OECD Europe	30	35	44	45	24	32	27	47	28	35	59	-25	
FSU	627	612	530	538	299	287	278	248	257	209	454	-245	
Saudi Arabia	193	141	169	221	231	209	131	139	97	66	213	-147	
Algeria	2	-	-	-	-	-	-	-	-	-	-	-	
Other Middle East and Africa	71	156	161	200	208	270	252	236	251	215	247	-31	
Singapore	17	19	37	33	33	32	20	22	11	32	34	-2	
OECD Asia Oceania	32	42	30	45	30	26	17	17	6	25	50	-25	
Non-OECD Asia (excl. Singapore)	101	123	152	269	204	182	140	104	198	124	346	-222	
Other	15	21	23	9	9	7	3	8	0	28	6	22	
Total²	1190	1188	1223	1486	1164	1260	1052	992	949	799	1500	-702	
of which Non-OECD	1062	1107	1120	1315	1008	1021	852	805	842	716	1359	-643	
OECD Asia Oceania													
OECD Americas	4	0	0	0	0	-	0	-	0	-	-	-	
Venezuela	-	-	-	-	-	-	-	-	-	-	-	-	
Other Central and South America	0	-	-	-	-	-	-	-	-	-	-	-	
ARA (Belgium Germany Netherlands)	0	0	0	0	0	0	0	0	-	-	-	-	
Other Europe	-	0	0	-	0	-	-	-	-	-	-	-	
FSU	2	1	-	-	-	-	-	-	-	-	-	-	
Saudi Arabia	-	-	-	-	-	-	-	-	-	-	-	-	
Algeria	-	-	-	-	-	-	-	-	-	-	-	-	
Other Middle East and Africa	13	4	6	-	-	3	5	-	-	-	-	-	
Singapore	91	109	112	97	123	77	85	86	86	86	97	-10	
Non-OECD Asia (excl. Singapore)	208	229	191	209	209	297	322	327	260	204	164	40	
Other	9	6	10	20	3	7	12	2	34	2	38	-36	
Total²	328	349	319	325	336	384	424	416	380	292	298	-6	
of which Non-OECD	323	349	319	325	336	384	424	415	380	292	298	-6	
Total OECD Trade²	1652	1734	1641	1931	1658	1704	1528	1458	1387	1182	1849	-666	
of which Non-OECD	1488	1591	1482	1688	1441	1444	1316	1263	1263	1025	1661	-636	

¹ Based on Monthly Oil Questionnaire data submitted by OECD countries in tonnes.

² Total figure excludes intra-regional trade.

Table 11
REGIONAL OECD JET AND KEROSENE IMPORTS BY SOURCE¹
(thousand barrels per day)

	2020	2021	2022	4Q22	1Q23	2Q23	3Q23	Aug 23	Sep 23	Oct 23	Year Earlier		
											Oct 22	change	
OECD Americas													
Venezuela	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Central and South America	5	1	0	1	1	3	1	-	3	-	3	-	
ARA (Belgium Germany Netherlands)	-	5	0	0	-	1	1	-	-	-	1	-	
Other Europe	4	7	1	4	11	1	1	2	-	-	0	-	
FSU	0	4	1	-	-	-	-	-	-	-	-	-	
Saudi Arabia	6	6	1	1	3	5	5	-	-	3	-	-	
Algeria	1	4	0	1	-	-	-	-	-	-	-	-	
Other Middle East and Africa	11	18	16	38	33	32	27	11	22	16	52	-37	
Singapore	4	2	1	2	-	5	2	5	3	1	-	-	
OECD Asia Oceania	100	91	85	85	80	97	68	70	57	110	59	52	
Non-OECD Asia (excl. Singapore)	23	27	24	44	48	12	24	14	46	1	48	-48	
Other	4	1	3	1	4	3	7	10	-	-	-	-	
Total²	159	165	134	177	178	160	136	111	130	131	163	-32	
of which Non-OECD	55	63	48	89	91	60	66	39	74	20	104	-83	
OECD Europe													
OECD Americas	13	3	6	11	6	6	9	19	3	2	17	-15	
Venezuela	-	-	-	-	-	-	-	-	-	-	-	-	
Other Central and South America	0	0	0	-	3	-	1	-	3	-	-	-	
Non-OECD Europe	0	0	3	5	1	3	3	-	0	8	0	8	
FSU	21	27	16	14	15	19	11	10	13	18	15	3	
Saudi Arabia	40	27	57	61	45	51	60	51	66	65	73	-8	
Algeria	9	5	4	-	-	-	-	-	-	-	-	-	
Other Middle East and Africa	155	153	172	145	186	199	282	306	201	262	168	94	
Singapore	10	11	13	10	11	-	3	3	-	1	9	-8	
OECD Asia Oceania	27	32	54	102	6	49	90	69	147	54	127	-73	
Non-OECD Asia (excl. Singapore)	50	61	121	187	107	149	138	124	153	130	189	-59	
Other	10	9	5	0	1	0	1	1	0	-	-	-	
Total²	336	328	452	536	380	475	598	583	587	540	599	-59	
of which Non-OECD	297	294	393	423	370	423	506	497	456	486	455	31	
OECD Asia Oceania													
OECD Americas	-	0	0	0	0	0	0	-	0	0	0	0	
Venezuela	-	-	-	-	-	-	-	-	-	-	-	-	
Other Central and South America	-	-	-	-	-	-	-	-	-	-	-	-	
ARA (Belgium Germany Netherlands)	-	0	0	0	-	-	-	-	-	0	-	-	
Other Europe	-	0	0	-	-	0	0	0	-	-	-	-	
FSU	-	-	-	-	-	-	-	-	-	-	-	-	
Saudi Arabia	-	-	-	-	-	-	-	-	-	-	-	-	
Algeria	-	-	-	-	-	-	-	-	-	-	-	-	
Other Middle East and Africa	-	1	0	0	0	0	2	0	0	0	-	-	
Singapore	14	16	34	39	44	41	34	40	39	37	43	-6	
Non-OECD Asia (excl. Singapore)	28	34	38	72	83	41	66	57	77	70	63	7	
Other	18	19	15	27	33	32	26	13	45	45	14	31	
Total²	60	69	87	139	161	113	128	110	161	152	121	31	
of which Non-OECD	60	69	87	139	161	113	128	110	161	152	120	31	
Total OECD Trade²	555	562	673	852	720	748	861	804	878	823	882	-60	
of which Non-OECD	413	426	528	650	622	597	701	645	691	658	680	-21	

¹ Based on Monthly Oil Questionnaire data submitted by OECD countries in tonnes.

² Total figure excludes intra-regional trade.

Table 12
REGIONAL OECD RESIDUAL FUEL OIL IMPORTS BY SOURCE¹
(thousand barrels per day)

	2020	2021	2022	4Q22	1Q23	2Q23	3Q23	Aug 23	Sep 23	Oct 23	Year Earlier	
											Oct 22	change
OECD Americas												
Venezuela	-	-	-	-	-	-	-	-	-	-	-	-
Other Central and South America	52	34	53	69	44	16	42	46	79	33	55	-22
ARA (Belgium Germany Netherlands)	12	6	12	18	9	4	1	-	0	19	19	0
Other Europe	21	10	19	18	11	1	3	0	-	15	7	8
FSU	43	34	21	9	1	4	-	-	-	-	21	-
Saudi Arabia	2	0	7	6	3	0	-	-	-	-	-	-
Algeria	2	7	4	1	18	4	-	-	-	-	-	-
Other Middle East and Africa	10	8	4	5	15	10	9	2	13	-	4	-
Singapore	1	0	-	-	-	-	1	2	-	-	-	-
OECD Asia Oceania	-	0	-	-	-	8	-	-	-	-	-	-
Non-OECD Asia (excl. Singapore)	-	2	2	6	4	4	3	5	-	5	12	-6
Other	-	-	-	-	-	-	0	1	-	-	-	-
Total²	143	102	122	132	105	51	59	57	91	73	118	-46
of which Non-OECD	110	86	90	96	86	38	54	57	91	38	92	-54
OECD Europe												
OECD Americas	12	24	13	11	5	16	15	30	7	64	10	55
Venezuela	-	-	-	-	-	-	-	-	-	-	-	-
Other Central and South America	6	4	5	10	4	11	6	3	1	-	-	-
Non-OECD Europe	13	12	31	25	21	25	21	25	15	18	54	-36
FSU	141	247	121	63	45	59	61	42	40	32	53	-21
Saudi Arabia	2	-	-	-	10	0	-	-	-	0	-	-
Algeria	2	2	5	2	5	9	6	7	2	15	-	-
Other Middle East and Africa	13	14	21	31	27	26	4	5	4	6	44	-39
Singapore	3	3	2	0	1	-	-	-	-	-	-	-
OECD Asia Oceania	4	3	8	11	16	10	6	7	13	-	7	-
Non-OECD Asia (excl. Singapore)	-	0	2	6	8	-	-	-	-	0	7	-7
Other	93	59	45	67	2	1	2	1	1	1	62	-61
Total²	288	368	254	227	144	157	123	119	84	136	237	-101
of which Non-OECD	279	347	239	220	126	133	103	82	64	72	261	-189
OECD Asia Oceania												
OECD Americas	-	-	0	-	-	-	-	-	-	-	-	-
Venezuela	-	-	-	-	-	-	-	-	-	-	-	-
Other Central and South America	0	-	-	-	-	-	-	-	-	-	-	-
ARA (Belgium Germany Netherlands)	-	0	0	0	-	-	-	-	-	-	0	-
Other Europe	-	-	0	0	-	-	-	-	-	-	0	-
FSU	5	0	-	-	-	-	-	-	-	-	-	-
Saudi Arabia	1	13	16	7	7	11	13	10	-	19	-	-
Algeria	-	-	-	-	-	-	-	-	-	-	-	-
Other Middle East and Africa	38	30	7	13	9	7	13	-	41	-	14	-
Singapore	18	29	22	14	37	19	33	18	19	40	4	36
Non-OECD Asia (excl. Singapore)	26	47	44	41	54	49	68	88	87	70	71	-1
Other	-	-	-	-	-	-	3	4	6	0	-	-
Total²	88	119	89	75	107	86	131	120	153	129	90	39
of which Non-OECD	88	119	89	75	107	86	131	120	153	129	90	40
Total OECD Trade²	519	588	464	434	356	293	312	296	328	338	445	-108
of which Non-OECD	477	552	418	390	318	257	288	259	308	240	443	-203

¹ Based on Monthly Oil Questionnaire data submitted by OECD countries in tonnes.

² Total figure excludes intra-regional trade.

Table 13
AVERAGE IEA CIF CRUDE COST AND SPOT CRUDE AND PRODUCT PRICES

	2020	2021	2022	4Q22	1Q23	2Q23	3Q23	Jul 23	Aug 23	Sep 23	Oct 23	Nov 23	Dec 23
CRUDE PRICES													
IEA CIF Average Import¹													
IEA Europe	42.91	70.67	100.22	89.42	82.16	79.75	87.94	81.61	87.93	94.77	94.31		
IEA Americas	37.31	64.78	90.77	77.18	67.91	70.63	78.24	72.27	78.62	84.15	82.48		
IEA Asia Oceania	46.28	70.41	102.56	96.43	86.14	83.19	84.91	80.59	84.18	89.69	95.02		
IEA Total	42.19	68.87	98.2	87.96	79.25	78.03	84.49	78.77	84.35	90.6	91.58		
SPOT PRICES²													
North Sea Dated	41.76	70.82	101.10	88.36	81.11	78.02	86.74	80.09	86.18	93.96	91.12	83.05	77.85
North Sea Dated M1	42.90	71.51	101.17	89.54	82.37	78.02	86.69	80.50	85.87	93.76	90.62	82.60	77.77
WTI (Cushing) M1	39.25	68.10	94.58	82.82	75.96	73.54	82.51	76.39	81.41	89.57	85.57	77.44	72.08
WTI (Houston) M1	40.71	69.01	96.19	84.33	77.74	74.69	84.01	77.91	82.97	91.01	86.47	78.61	73.95
Urals	41.21	69.00	76.58	62.46	46.77	54.63	72.79	63.31	72.91	82.13	80.00	70.16	62.34
Dubai M1	42.36	69.35	96.27	84.68	80.20	77.56	86.54	80.33	86.44	93.19	89.81	83.41	77.31
PRODUCT PRICES²													
Northwest Europe													
Gasoline	44.64	80.07	117.01	99.41	96.17	99.44	112.44	105.34	116.85	114.93	97.21	93.53	86.69
Diesel	49.34	78.41	142.36	139.55	113.71	96.12	119.87	105.24	122.52	131.73	122.28	114.84	105.48
Jet/Kero	45.80	77.31	139.91	130.90	114.74	95.43	120.67	106.12	124.27	131.44	123.52	117.16	107.57
Naphtha	40.18	71.58	86.51	72.63	77.95	67.47	71.72	64.42	72.14	78.59	72.52	70.58	71.51
HSFO	33.99	61.18	76.58	59.55	60.51	67.96	82.63	73.63	85.20	88.93	76.14	70.01	67.09
0.5% Fuel Oil	48.50	76.78	107.05	87.19	83.99	79.21	88.17	81.92	89.91	92.59	90.09	86.22	81.16
Mediterranean Europe													
Gasoline	45.57	80.50	119.73	103.89	100.36	98.77	112.74	105.88	115.19	117.04	97.49	95.54	89.61
Diesel	48.82	77.93	136.11	130.46	112.08	94.97	118.10	104.35	120.94	128.88	120.24	109.55	102.91
Jet/Kero	45.57	77.19	140.02	131.28	114.89	95.43	120.60	106.08	124.27	131.28	123.52	116.93	107.31
Naphtha	39.04	70.65	84.62	70.36	75.83	65.93	69.99	62.93	70.50	76.51	70.88	68.46	69.31
HSFO	34.17	60.05	73.40	56.73	56.97	65.19	81.00	74.44	82.14	86.37	73.99	64.91	61.66
US Gulf Coast													
Gasoline	47.30	86.49	123.00	103.04	105.58	103.93	117.09	112.06	120.82	117.59	96.33	87.71	83.67
Diesel	50.26	84.73	145.74	141.65	120.39	100.11	124.92	109.56	128.02	135.95	124.95	111.15	99.94
Jet/Kero	46.30	77.95	140.05	134.73	125.00	94.79	120.40	105.09	125.34	129.27	119.20	113.64	100.03
Naphtha	40.12	72.24	91.24	76.09	80.92	74.87	72.92	69.63	71.31	77.91	74.40	71.31	67.36
HSFO	34.71	59.90	76.96	55.48	57.10	64.07	78.65	72.69	79.81	82.98	74.51	70.92	72.91
0.5% Fuel Oil	49.88	79.69	112.92	92.69	90.54	82.18	93.20	84.63	94.78	99.55	93.96	87.05	84.31
Singapore													
Gasoline	45.28	78.49	110.86	89.89	95.15	89.57	99.68	93.13	101.68	104.47	93.71	92.36	87.26
Diesel	49.60	77.80	135.47	126.25	108.44	93.09	115.23	101.79	119.07	125.32	117.46	106.48	99.78
Jet/Kero	45.06	75.29	126.90	118.30	106.38	91.57	112.47	98.85	116.28	122.77	113.58	106.63	101.70
Naphtha	40.94	71.02	83.79	70.92	74.21	63.26	69.18	62.43	70.65	74.73	70.80	69.57	72.69
HSFO	38.33	63.20	77.65	58.60	62.36	68.53	80.28	74.54	83.93	82.46	72.99	69.51	67.93
0.5% Fuel Oil	52.85	80.81	116.78	97.77	90.95	86.97	94.06	86.94	95.78	99.72	100.04	99.03	88.96

¹ IEA CIF Average Import price for Oct is an estimate.

IEA Europe includes all countries in OECD Europe except Estonia, Hungary and Slovenia.

IEA Americas includes United States and Canada.

IEA Asia Oceania includes Australia, New Zealand, Korea and Japan.

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Table 14
MONTHLY AVERAGE END-USER PRICES FOR PETROLEUM PRODUCTS

December 2023

	NATIONAL CURRENCY ¹						US DOLLARS					
	Total Price	% change from		Ex-Tax Price	% change from		Total Price	% change from		Ex-Tax Price	% change from	
		Nov-23	Dec-22		Nov-23	Dec-22		Nov-23	Dec-22		Nov-23	Dec-22
GASOLINE ² (per litre)												
France	1.800	-2.1	6.8	0.809	-3.8	1.5	1.964	-1.2	10.1	0.883	-2.9	4.6
Germany	1.779	-2.8	1.8	0.772	-5.3	-5.3	1.941	-1.9	4.9	0.843	-4.4	-2.4
Italy	1.776	-2.8	6.4	0.728	-5.5	-10.7	1.938	-2.0	9.7	0.794	-4.6	-7.9
Spain	1.550	-3.9	-4.4	0.808	-6.0	-18.5	1.692	-3.0	-1.4	0.882	-5.2	-16.0
United Kingdom	1.429	-5.4	-8.0	0.661	-9.3	-13.6	1.809	-3.7	-4.3	0.837	-7.7	-10.1
Japan	175.0	0.7	4.1	102.5	1.2	6.5	1.215	4.8	-2.6	0.711	5.2	-0.3
Canada	1.472	-3.8	1.9	0.982	-5.1	0.1	1.097	-1.6	3.2	0.732	-3.0	1.4
United States	0.828	-5.6	-2.4	0.694	-6.6	-3.1	0.828	-5.6	-2.4	0.694	-6.6	-3.1
AUTOMOTIVE DIESEL FOR NON COMMERCIAL USE (per litre)												
France	1.752	-3.2	-0.6	0.851	-5.3	-9.7	1.912	-2.3	2.5	0.929	-4.5	-6.9
Germany	1.702	-3.4	-6.3	0.885	-5.4	-16.3	1.857	-2.5	-3.4	0.966	-4.6	-13.7
Italy	1.747	-3.6	0.7	0.815	-6.2	-16.8	1.907	-2.8	3.8	0.889	-5.4	-14.3
Spain	1.516	-5.0	-10.6	0.874	-7.0	-23.7	1.654	-4.1	-7.8	0.954	-6.2	-21.4
United Kingdom	1.514	-4.8	-15.5	0.732	-7.9	-24.0	1.916	-3.0	-12.1	0.927	-6.2	-20.9
Japan	154.6	0.8	4.3	108.6	1.1	5.7	1.073	4.9	-2.4	0.754	5.2	-1.0
Canada	1.724	-7.1	-16.2	1.247	-8.8	-20.9	1.285	-5.0	-15.1	0.930	-6.7	-19.8
United States	1.049	-6.7	-15.7	0.894	-7.7	-18.1	1.049	-6.7	-15.7	0.894	-7.7	-18.1
DOMESTIC HEATING OIL (per litre)												
France	1.229	-5.1	-7.8	0.868	-6.0	-9.0	1.341	-4.2	-4.9	0.947	-5.1	-6.2
Germany	1.120	-2.8	-9.9	0.799	-3.3	-18.7	1.222	-2.0	-7.1	0.872	-2.5	-16.1
Italy	1.524	-3.6	-7.5	0.846	-5.2	-10.7	1.663	-2.7	-4.6	0.923	-4.3	-7.9
Spain	1.020	-5.6	-12.8	0.746	-6.3	-14.2	1.113	-4.7	-10.1	0.814	-5.4	-11.6
United Kingdom	0.761	-4.3	-18.3	0.623	-5.0	-20.7	0.963	-2.6	-15.0	0.788	-3.2	-17.5
Japan ³	116.5	0.6	5.1	103.1	0.6	5.3	0.809	4.7	-1.6	0.716	4.7	-1.5
Canada	1.635	-6.8	-16.2	1.480	-4.8	-14.9	1.219	-4.8	-15.1	1.103	-2.7	-13.8
United States	-	-	-	-	-	-	-	-	-	-	-	-
LOW SULPHUR FUEL OIL FOR INDUSTRY ⁴ (per kg)												
France	0.670	-3.7	1.9	0.530	-4.6	2.4	0.731	-2.8	5.1	0.579	-3.8	5.6
Germany	-	-	-	-	-	-	-	-	-	-	-	-
Italy	0.613	-6.2	-4.0	0.582	-6.5	-4.2	0.669	-5.3	-1.1	0.635	-5.7	-1.3
Spain	0.627	-4.5	-0.8	0.610	-4.6	-0.9	0.685	-3.6	2.2	0.666	-3.8	2.2
United Kingdom	-	-	-	-	-	-	-	-	-	-	-	-
Japan	-	-	-	-	-	-	-	-	-	-	-	-
Canada	-	-	-	-	-	-	-	-	-	-	-	-
United States	-	-	-	-	-	-	-	-	-	-	-	-

¹ Prices for France, Germany, Italy and Spain are in Euros; UK in British Pounds, Japan in Yen, Canada in Canadian Dollars

² Unleaded premium (95 RON) for France, Germany, Italy, Spain, UK; regular unleaded for Canada, Japan and the United States.

³ Kerosene for Japan.

⁴ VAT excluded from prices for low sulphur fuel oil when refunded to industry.

Table 15
IEA Global Indicator Refining Margins

\$/bbl	2021	2022	2023	1Q23	2Q23	3Q23	4Q23	Jul 23	Aug 23	Sep 23	Oct 23	Nov 23	Dec 23
NW Europe													
Light sweet hydroskimming	2.54	10.05	7.82	8.41	4.42	11.90	6.31	8.24	14.96	12.36	4.76	7.43	6.81
Light sweet cracking	3.51	16.22	11.81	14.08	7.07	15.37	10.42	10.82	18.58	16.57	8.95	11.65	10.69
Light sweet cracking + Petchem	6.55	18.44	11.86	14.69	7.03	14.72	10.68	9.99	17.99	16.02	9.11	12.15	10.80
Medium sour cracking*	6.11	39.13	17.56	19.33	11.87	21.64	17.05	16.00	25.35	23.38	14.23	18.81	18.27
Mediumsour cracking + Petchem*	9.07	41.28	17.61	19.94	11.82	20.98	17.31	15.18	24.76	22.84	14.40	19.30	18.38
Mediterranean													
Light sweet hydroskimming	2.90	9.08	8.17	8.45	5.24	12.37	6.42	9.37	15.20	12.41	4.18	7.22	8.07
Light sweet cracking	4.97	16.82	13.97	15.80	9.42	18.58	11.75	14.56	21.71	19.31	10.03	12.47	12.89
Medium sour cracking	5.68	21.65	17.33	21.78	12.02	20.47	14.69	16.04	22.86	22.39	12.56	14.53	17.35
US Gulf Coast													
Light sweet cracking	11.04	26.64	20.47	25.53	18.83	26.07	11.44	23.51	30.40	23.53	12.40	11.73	10.10
Medium sour cracking	15.79	35.69	26.49	33.40	23.21	31.06	18.27	26.58	35.19	30.55	20.14	17.96	16.55
Heavy sour coking	19.98	45.92	34.61	44.90	28.64	38.57	26.35	32.59	43.60	38.46	27.26	27.18	24.51
US Midwest													
Light sweet cracking	12.33	29.90	19.52	25.23	22.00	20.43	10.43	17.66	25.99	16.66	10.18	16.07	5.06
Heavy sour coking	26.02	50.61	36.60	46.84	36.17	36.30	27.08	31.77	42.07	33.98	27.36	33.08	20.78
Singapore													
Light sweet cracking	3.10	11.46	7.26	9.94	3.19	8.94	6.73	5.99	11.93	8.89	4.49	7.72	8.23
Light sweet cracking + Petchem	4.82	12.94	8.07	10.83	4.45	9.44	7.35	6.73	12.34	9.24	5.23	8.58	8.43
Medium sour cracking	3.92	12.81	9.02	11.35	5.04	11.65	7.79	7.91	14.77	12.31	6.67	7.18	9.76
Medium sour cracking + Petchem	5.61	14.27	9.82	12.23	6.29	12.14	8.40	8.63	15.17	12.65	7.40	8.03	9.96

Source: IEA, Argus Media Ltd prices.

Methodology notes are available at <https://www.iea.org/data-and-statistics/data-product/oil-market-report-omr/#documentation>

*From 1 December 2022, the basis has changed from Urals NWE to Argus Brent Sour

Table 16
REFINED PRODUCT YIELDS BASED ON TOTAL INPUT (% VOLUME)¹

	Aug-23	Sep-23	Oct-23	Oct-22	Oct 23 vs Previous Month	Oct 23 vs Previous Year	Oct 23 vs 5 Year Average	5 Year Average
OECD Americas								
Naphtha	1.0	1.0	0.9	0.9	-0.1	0.0	-0.3	1.2
Motor gasoline	43.9	44.1	45.4	45.8	1.3	-0.4	-1.8	47.3
Jet/kerosene	9.7	9.2	8.9	8.6	-0.3	0.3	1.0	8.0
Gasoil/diesel oil	27.9	26.8	28.3	29.2	1.5	-0.9	-0.3	28.6
Residual fuel oil	2.9	3.1	2.9	3.4	-0.2	-0.5	-0.2	3.0
Petroleum coke	4.2	4.1	4.1	4.1	0.0	-0.1	-0.2	4.3
Other products	14.3	12.3	11.7	11.5	-0.6	0.2	0.1	11.6
OECD Europe								
Naphtha	8.6	8.5	8.5	8.6	0.0	-0.1	0.1	8.4
Motor gasoline	21.8	21.2	20.7	19.5	-0.5	1.3	-0.4	21.1
Jet/kerosene	9.8	9.2	9.1	7.7	-0.1	1.4	1.6	7.4
Gasoil/diesel oil	37.9	38.5	38.9	39.8	0.4	-0.9	-1.1	40.1
Residual fuel oil	8.1	8.0	8.9	9.3	0.9	-0.4	0.4	8.5
Petroleum coke	1.5	1.5	1.5	1.7	0.1	-0.1	0.1	1.5
Other products	15.4	15.4	14.5	15.2	-0.9	-0.7	-0.7	15.2
OECD Asia Oceania								
Naphtha	15.7	16.2	16.8	16.0	0.5	0.8	0.6	16.2
Motor gasoline	22.6	22.1	22.5	21.0	0.4	1.5	0.4	22.1
Jet/kerosene	14.6	14.6	14.6	13.6	0.1	1.0	1.1	13.6
Gasoil/diesel oil	29.2	29.3	29.6	31.2	0.3	-1.6	-0.9	30.4
Residual fuel oil	7.7	7.7	7.3	9.0	-0.4	-1.7	-0.4	7.7
Petroleum coke	0.2	0.3	0.3	0.3	0.0	0.0	0.0	0.4
Other products	11.8	11.9	11.3	11.7	-0.6	-0.5	-0.9	12.2
OECD Total								
Naphtha	5.8	5.9	6.1	5.9	0.2	0.2	-0.1	6.1
Motor gasoline	33.4	33.2	33.6	33.3	0.4	0.3	-0.8	34.4
Jet/kerosene	10.6	10.1	10.0	9.1	-0.1	0.8	1.2	8.8
Gasoil/diesel oil	31.3	30.9	31.9	32.9	1.0	-1.0	-0.8	32.7
Residual fuel oil	5.3	5.4	5.5	6.2	0.1	-0.7	-0.1	5.6
Petroleum coke	2.7	2.6	2.6	2.7	0.0	-0.1	-0.1	2.7
Other products	14.2	13.2	12.5	12.7	-0.7	-0.2	-0.4	12.9

¹ Due to processing gains and losses, yields in % will not always add up to 100%

Table 17
WORLD BIOFUELS PRODUCTION
(thousand barrels per day)

	2022	2023	2024	2Q23	3Q23	4Q23	Oct 23	Nov 23	Dec 23
ETHANOL									
OECD Americas	1031	1040	1017	1039	1050	1038	1062	1026	1026
United States	1002	1006	982	1005	1016	1004	1028	992	992
Other ¹	29	34	35	34	34	34			
OECD Europe	107	107	110	107	112	111	111	110	110
France	20	20	22	22	23	18	23	15	15
Germany	13	13	13	16	19	6	16	1	1
Spain	10	10	10	9	9	14	9	16	16
United Kingdom	9	9	9	7	7	13	7	16	16
Other ¹	54	55	55	54	54	60			
OECD Asia Oceania	4	4	4	4	4	5	4	5	5
Australia	4	4	4	4	4	4	4	4	4
Other ¹	0	1	1	1	1	1			
Total OECD Ethanol	1142	1152	1131	1151	1167	1154	1178	1141	1141
Total Non-OECD Ethanol	763	859	872	935	1248	844	1065	930	541
Brazil	528	601	603	677	991	586	807	672	283
China ¹	81	136	146	136	136	136			
Argentina ¹	21	22	23	22	22	22			
Other	133	100	100	100	100	100	258	258	258
TOTAL ETHANOL	1904	2011	2004	2085	2415	1998	2243	2071	1682
BIODIESEL									
OECD Americas	209	278	308	300	297	261	251	266	266
United States	203	264	291	288	285	239	239	239	239
Other ¹	6	15	18	12	12	22			
OECD Europe	307	313	323	304	310	338	306	354	354
France	48	48	48	52	52	43	47	41	41
Germany	64	63	62	59	63	68	57	74	74
Italy ¹	25	25	25	25	29	26			
Spain	31	32	35	31	31	36	32	38	38
Other	139	145	153	137	137	164	141	176	176
OECD Asia Oceania	14	13	13	16	17	12	11	12	12
Australia	0	0	0	0	0	0	0	0	0
Other ¹	14	13	13	16	17	12			
Total OECD Biodiesel	530	605	644	620	625	610	568	632	632
Total Non-OECD Biodiesel	513	580	630	580	580	580	580	580	580
Brazil	108	129	156	130	144	141	144	147	131
Argentina ¹	42	40	40	40	40	40			
Other ¹	363	411	434	410	396	399			
TOTAL BIODIESEL	1043	1185	1275	1199	1204	1190	1148	1211	1211
GLOBAL BIOFUELS	2947	3195	3278	3285	3619	3188	3390	3282	2894

¹ monthly data not available.

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Next Issue: 15 February 2024

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