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# Evolution of the Middle East oil scene: Transformations in refining and oil flows

Oil Research Programme  
Oxford Institute for Energy Studies



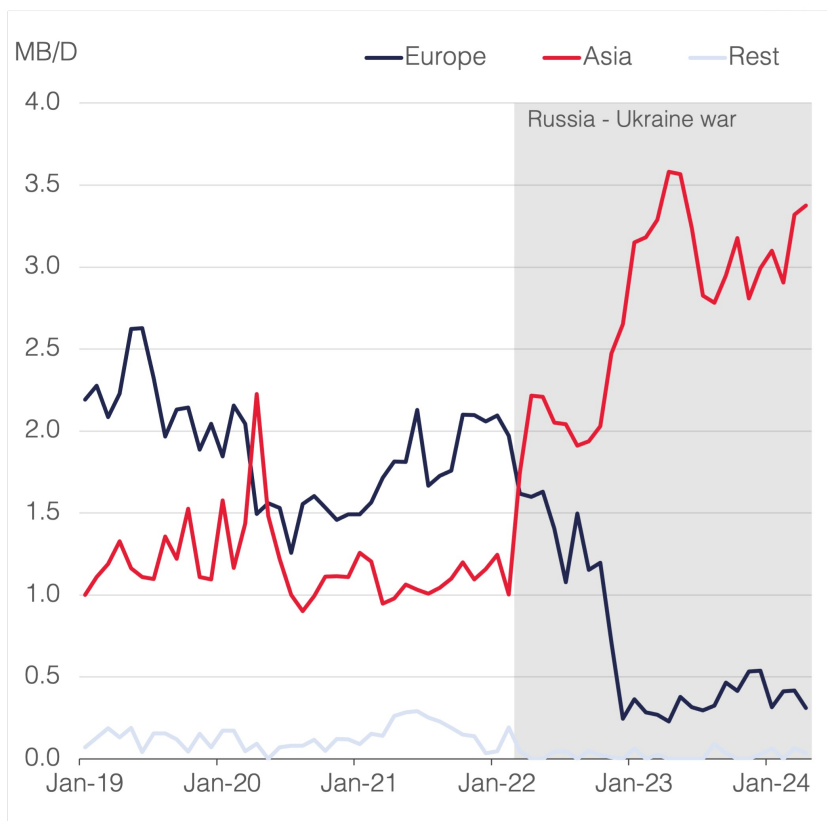
Oxford, June 2024



# Russia-Ukraine war: Massive shifts in trade flows

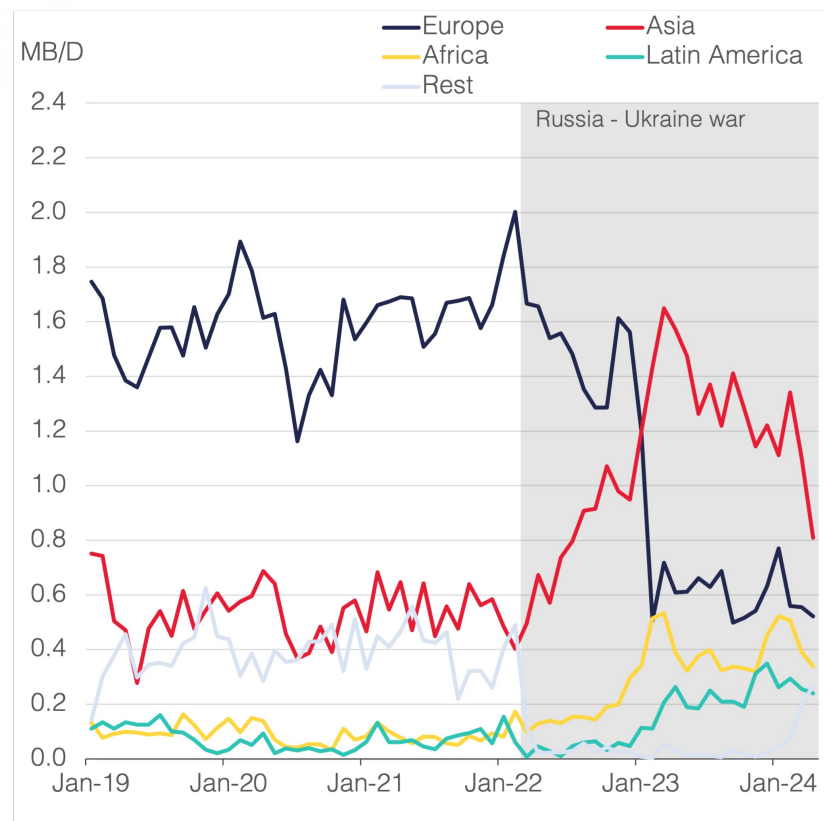
- The Russia-Ukraine war has caused major shifts in crude and products trade flows, with the oil market adjusting remarkably well to these structural transformations.

## Russia crude oil exports



Source: Kpler, OIES

## Russia oil products exports



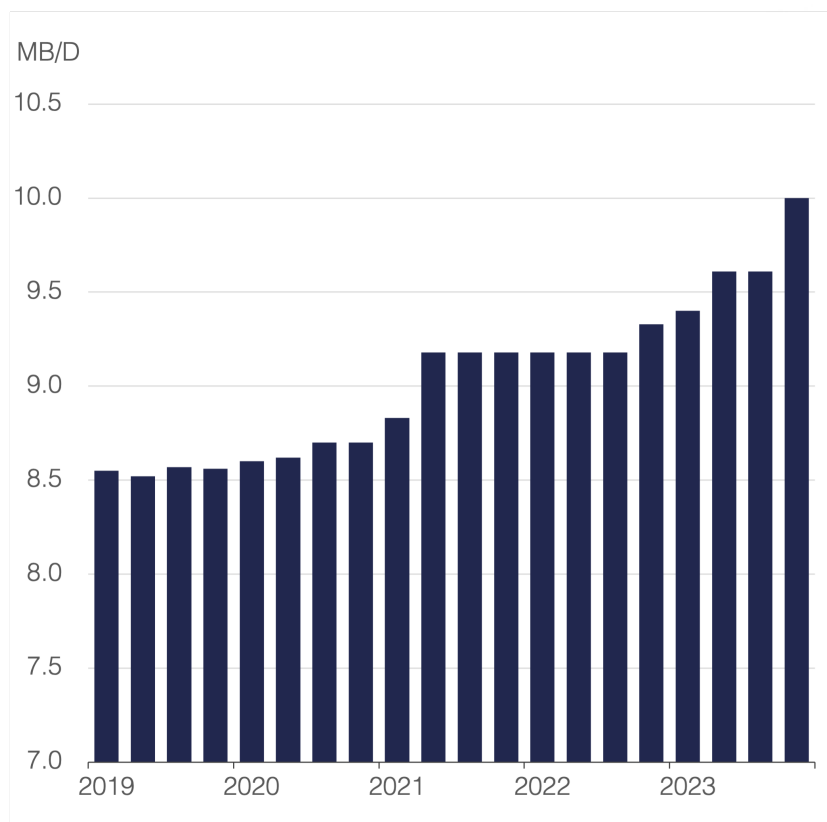
Source: Kpler, OIES



# Middle East's refining industry expanding

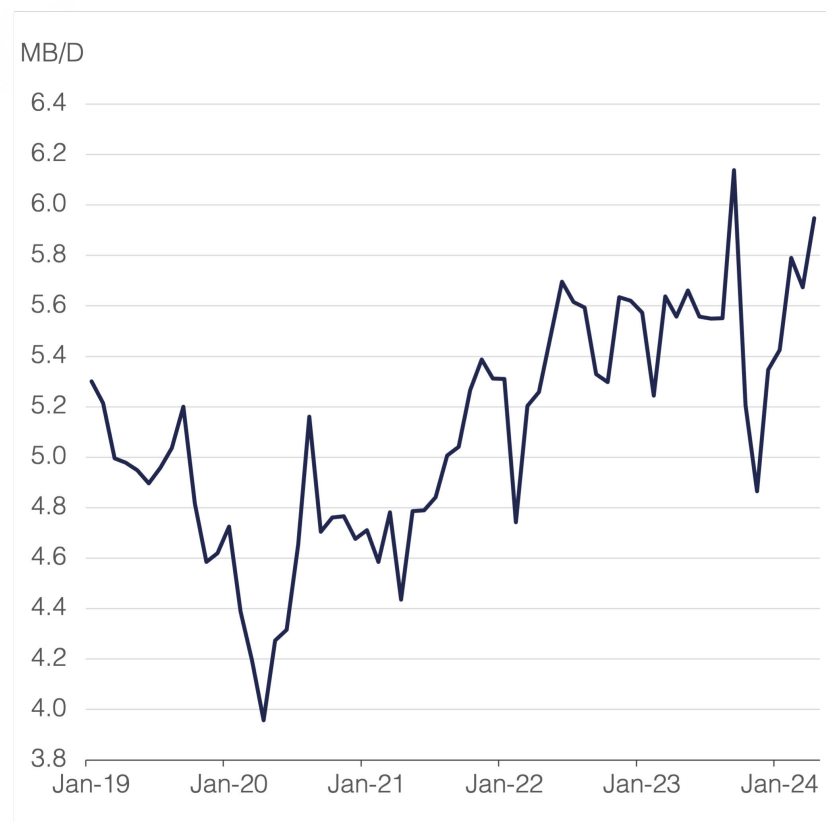
- These transformations in global oil trade flows coincided with a wave of new and upgraded refining capacity in the Gulf which intensified some of these shifts.

## Middle East refining capacity



Notes: Crude distillation.  
Source: S&P Global Commodity Insights, OIES

## GCC crude runs

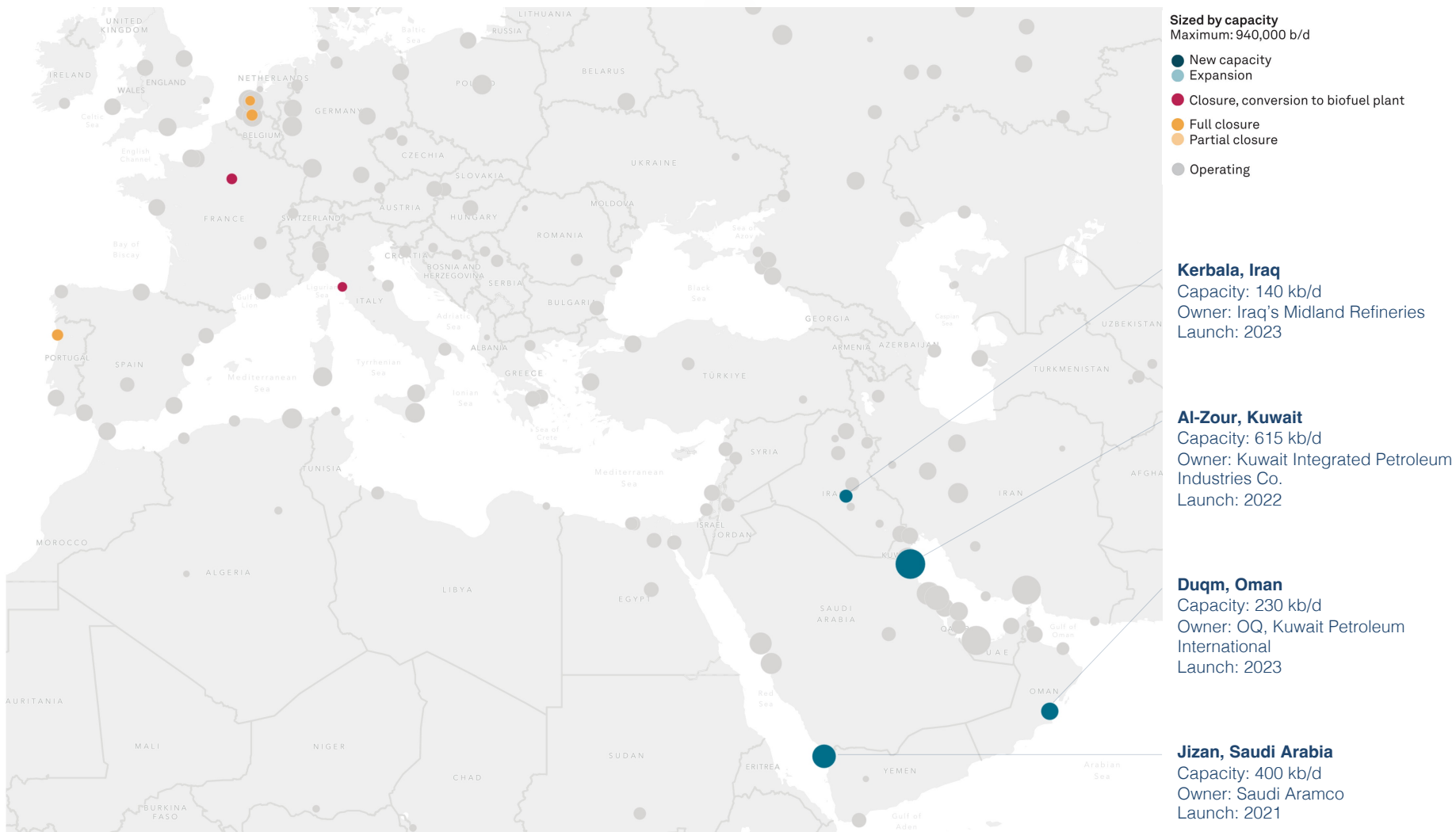


Source: Kpler, OIES



# New refining projects in the Middle East

## Refinery status 2020-2024



Notes: Reconstructed from Herman Wang, Middle East Refinery Focus: Region eyes new markets and cleaner fuels, S&P Global Commodity Insights.

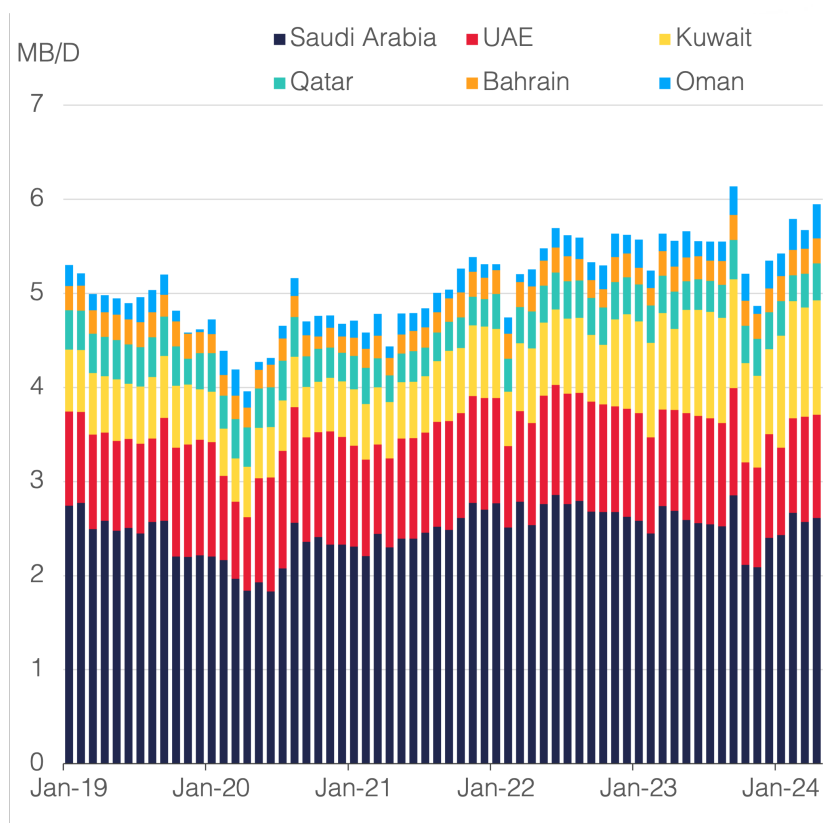
Source: S&P Global Commodity Insights, OIES



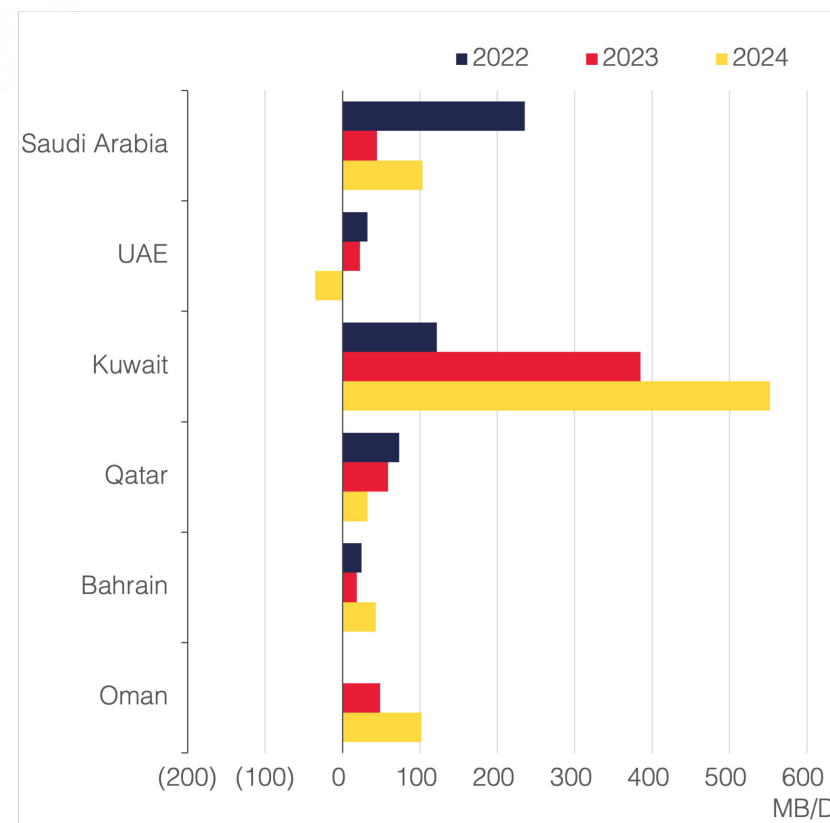
# GCC leads regional refining expansions

- Between 2021 and 2024 (Jan-Apr) GCC crude runs rose by 800 kb/d, with expanding and upgrading capacity in Kuwait, Saudi Arabia and Oman accounting for 95% of the total increase.

## GCC crude runs



## GCC crude runs vs 2021



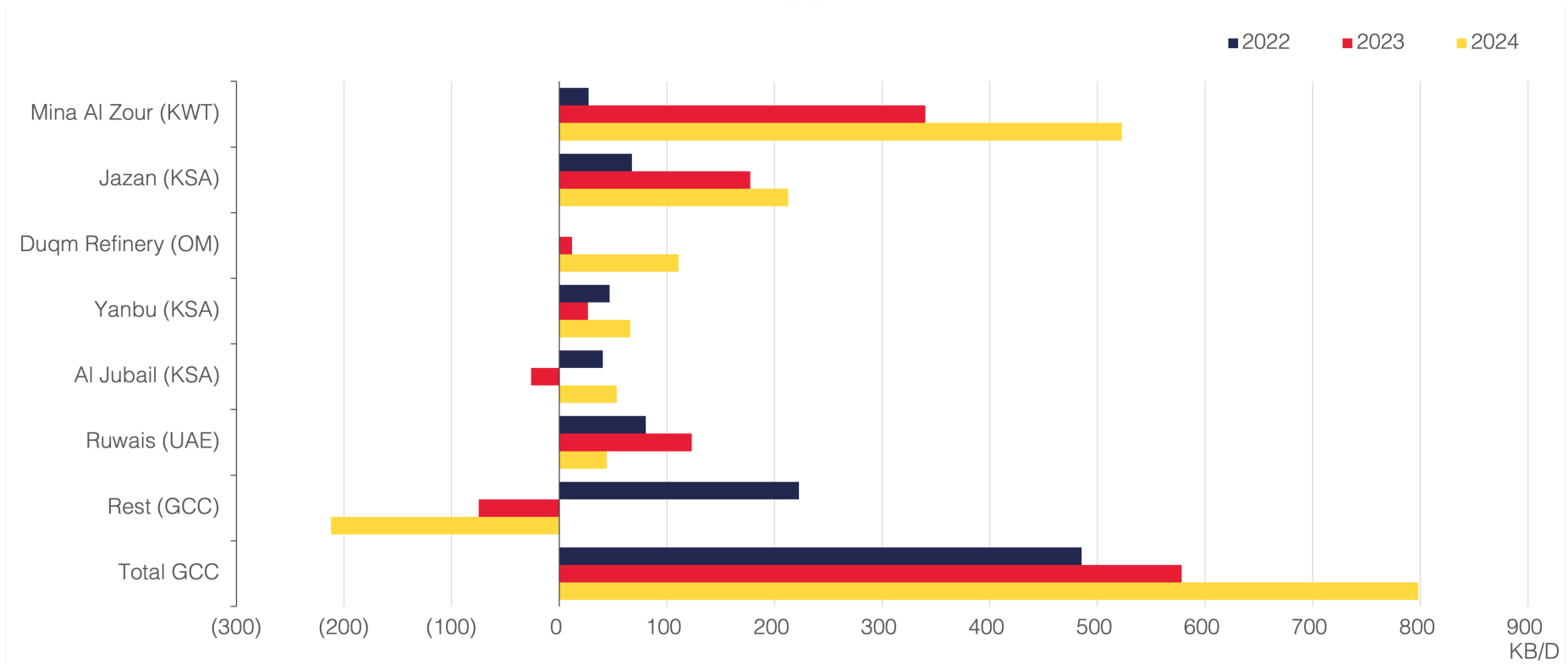
Notes: 2024 is January to April average.  
Source: Kpler, OIES



# Greenfield refineries key sources of growth

- The newest refineries in Kuwait (+520 kb/d), Saudi Arabia (+210 kb/d) and Oman (110 kb/d) alone contributed to increasing GCC runs since 2021 by 850 kb/d.

## GCC crude runs by refinery vs 2021



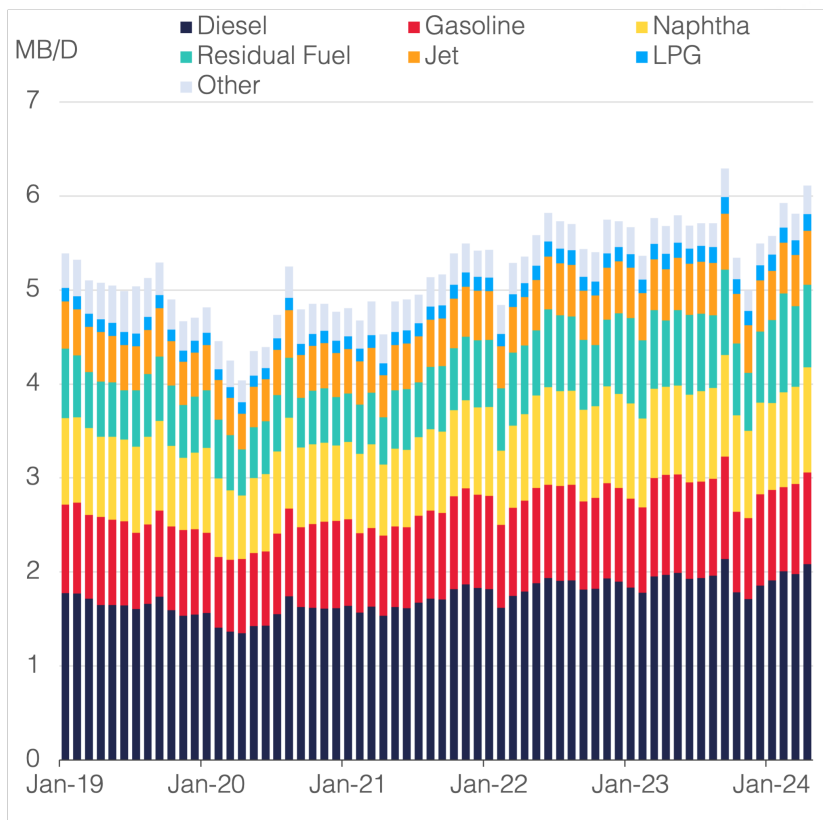
Notes: 2024 is January to April average.  
Source: Kpler, OIES



# Refining output turns into clean products

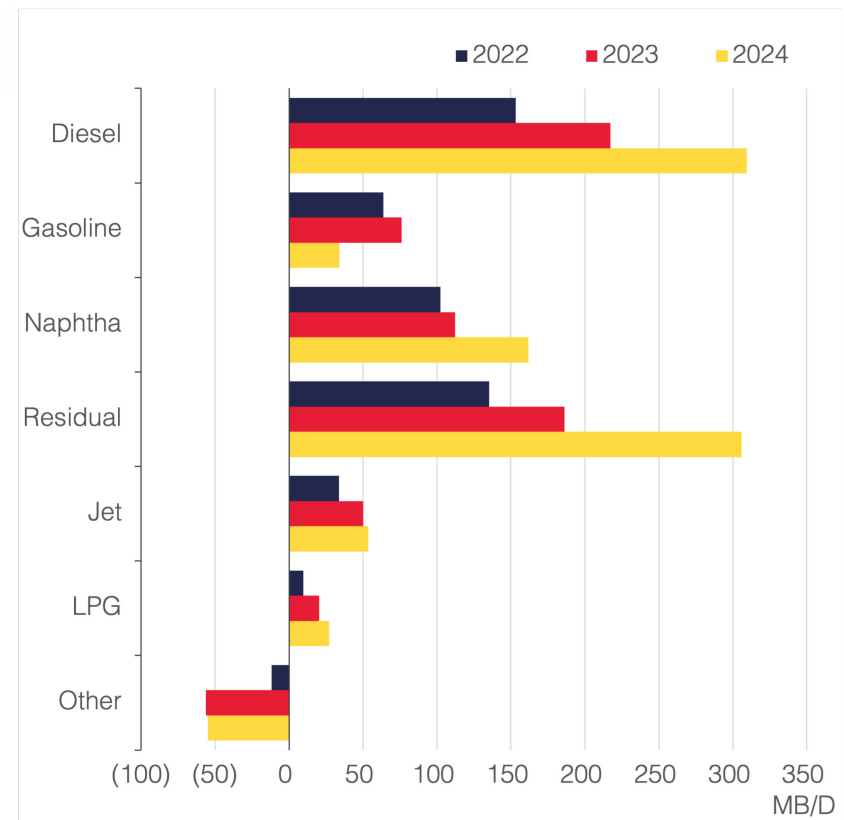
- Over 70% of refinery output growth since 2021 is associated with clean products, particularly diesel, destined to traditional markets in Asia but also new markets such as Europe filling the Russian gap.

## GCC refinery output



Source: Kpler, OIES

## GCC refinery output vs 2021



Notes: 2024 is January to April average.  
Source: Kpler, OIES

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# Implications on Middle East crude oil exports

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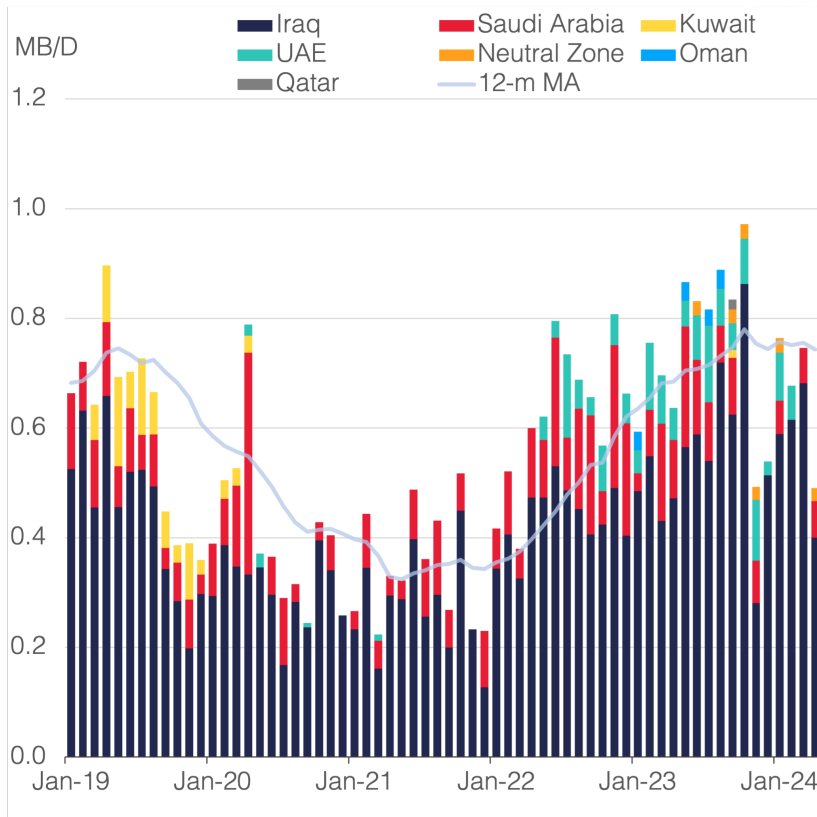




# Shifting flows to Europe

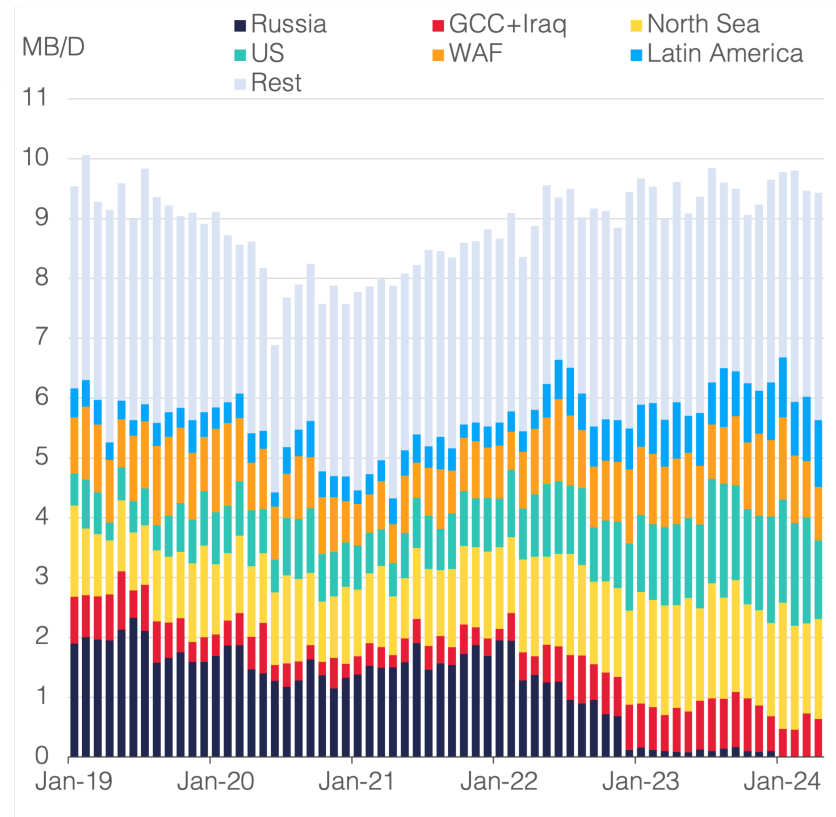
- Middle East crude exports to Europe increased by some 400 kb/d (2023 vs 2021) to partly replace Russian exports, originating mainly from Iraq, Saudi Arabia and the UAE.

## GCC + Iraq crude oil exports to EU-27



Source: Kpler, OIES

## EU-27 crude oil imports by origin



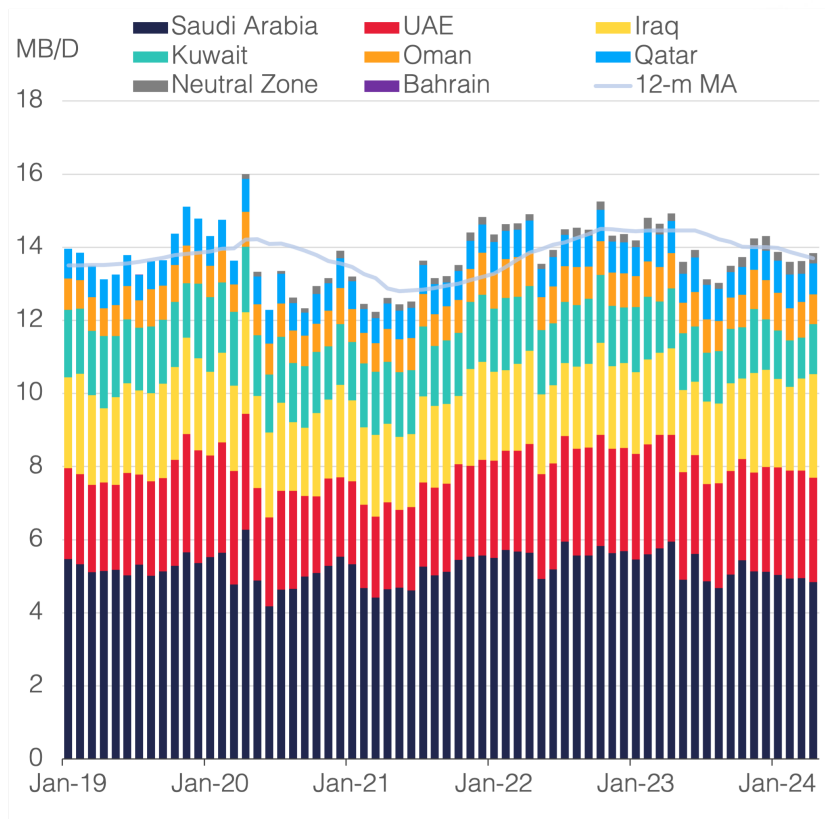
Source: Kpler, OIES



# Competition intensifies in Asia

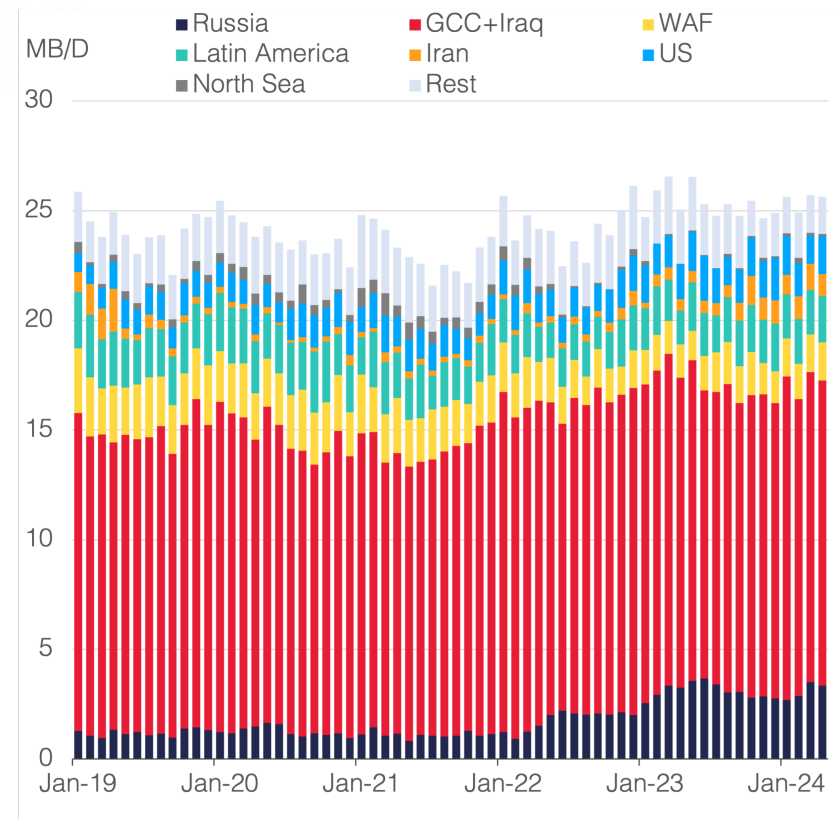
- Although competition from Russia intensified in Asia after the G7 ban on Russian oil, particularly in India and China, Middle East crude oil exports are maintained.

## GCC + Iraq crude oil exports to Asia



Source: Kpler, OIES

## Asia crude oil imports by origin



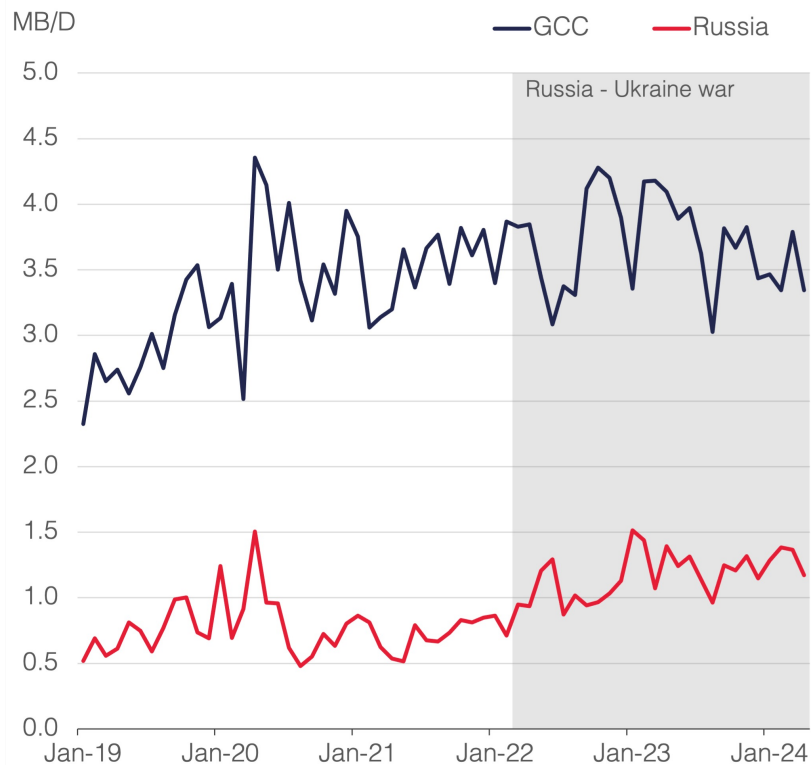
Source: Kpler, OIES



# GCC's exports share holds in China, falls in India

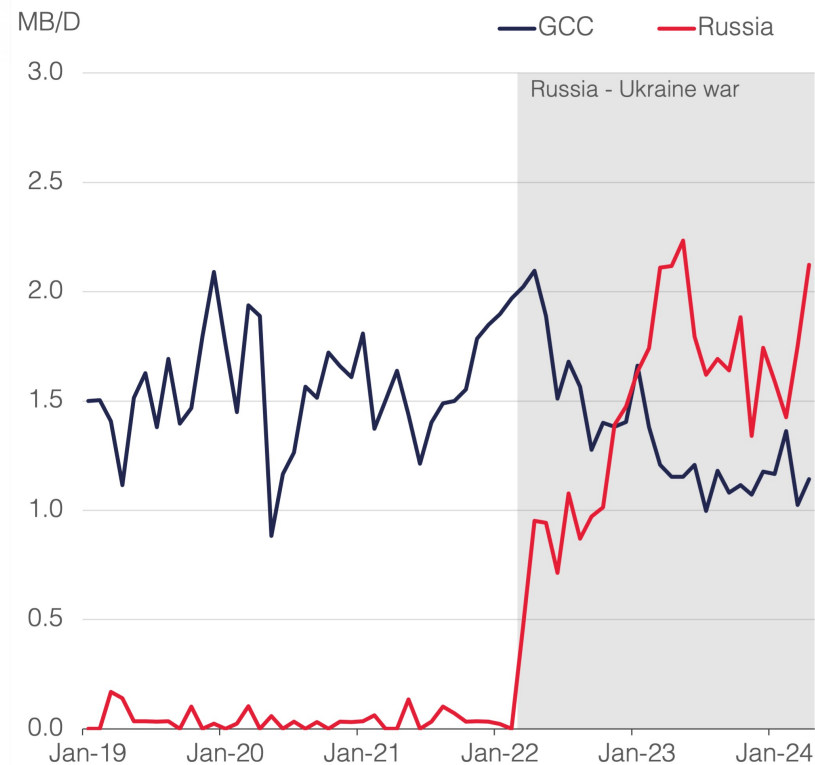
- GCC share to total crude oil exports to China was maintained near pre-war levels around 35% in 2023 but declined by 10% in India that took advantage of the “cheap” Russian crude, raising its intake to 40% in 2023 from 1% in 2021.

## Crude oil exports to China



Source: Kpler, OIES

## Crude oil exports to India



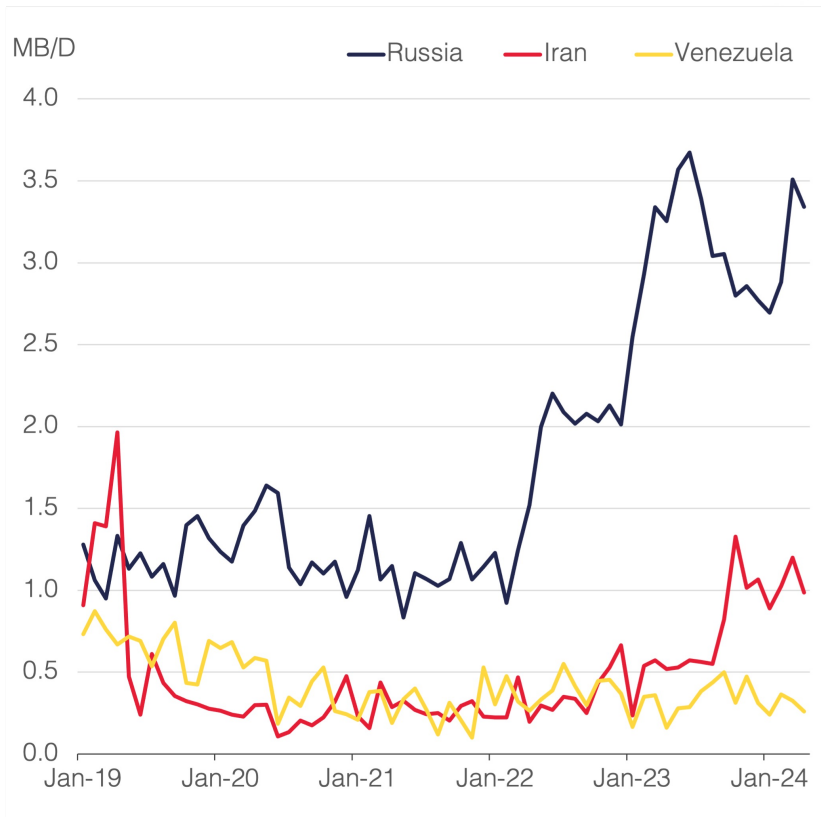
Source: Kpler, OIES



# Competition from sanctioned crudes in key growth markets

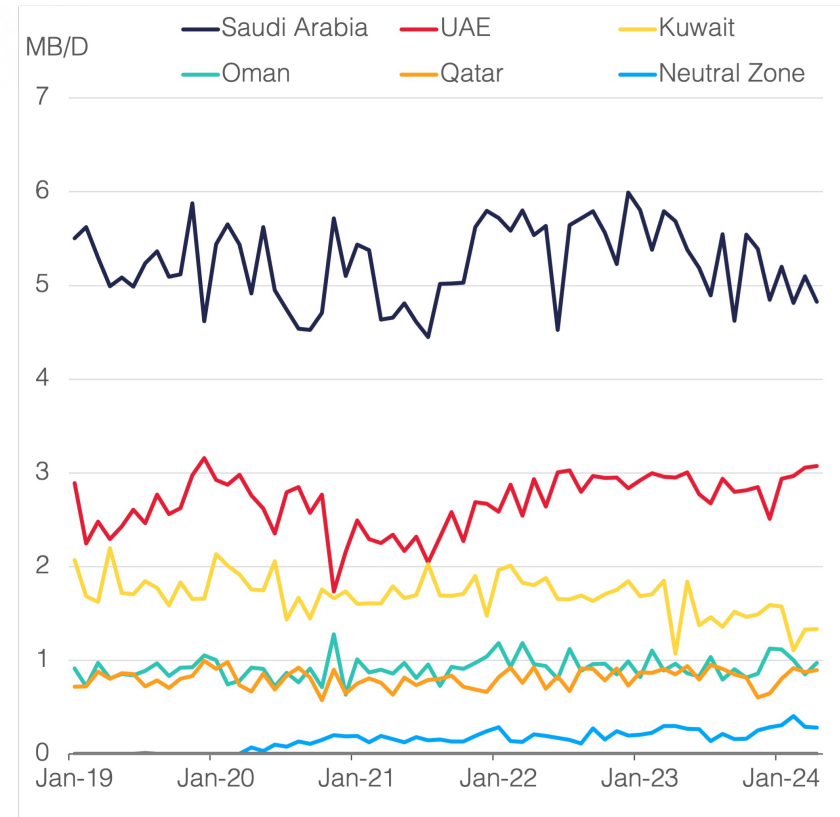
- Apart from Russia, Iranian crude exports also saw a large increase in Asia, particularly China, rising y/y by 96% or 340 kb/d in 2023 to 690 kb/d and averaging 1 mb/d in 1Q24 from 450 kb/d in 1Q23.

## Sanctioned crude oil exports to Asia



Source: Kpler, OIES

## GCC crude oil exports to Asia



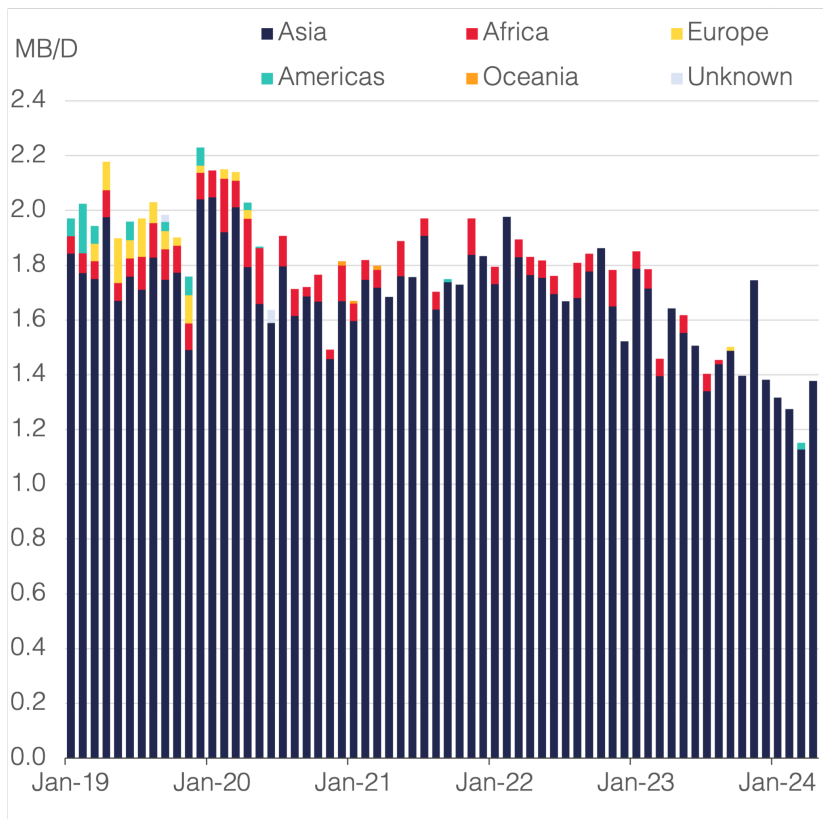
Source: Kpler, OIES



# Kuwait prioritizes exports of products over crude oil

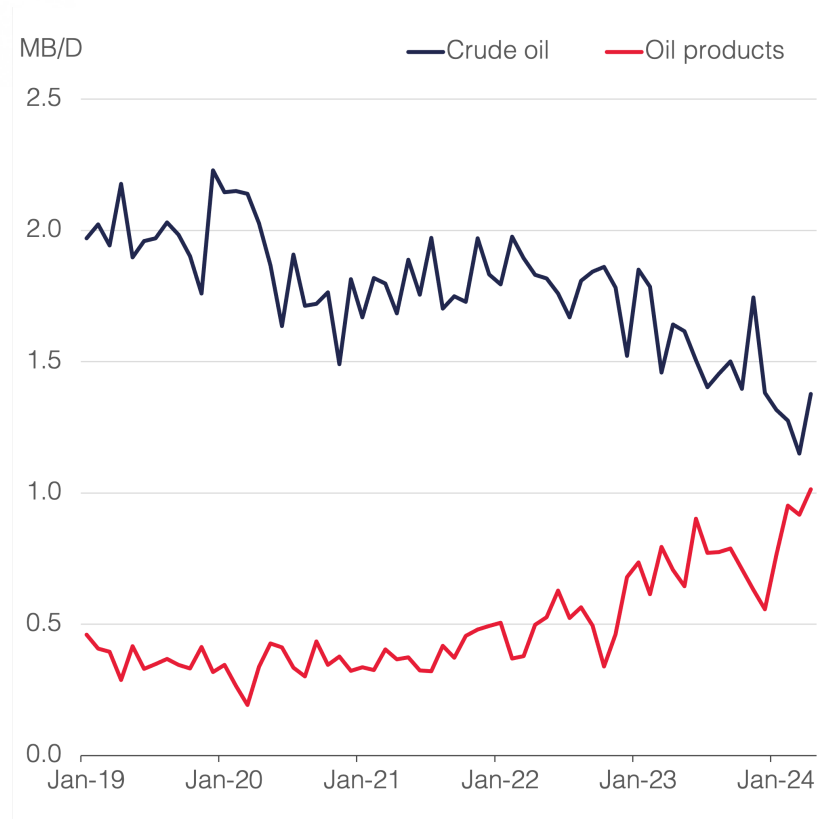
- The expanding and upgrading of the 615 kb/d Al-Zour refinery reduced Kuwait's crude exports by 240 kb/d y/y in 2023 in favor of increased refined products exports that rose by 220 kb/d y/y.

## Kuwait crude oil exports by destination



Source: Kpler, OIES

## Kuwait exports of crude vs oil products



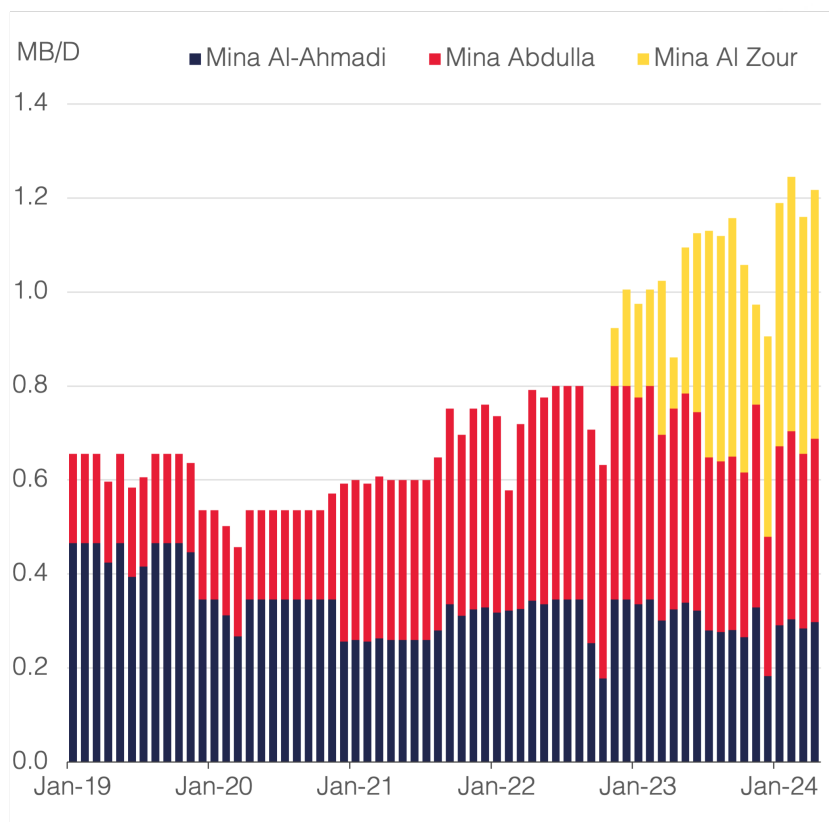
Source: Kpler, OIES



# Al-Zour lifts Kuwait's refinery runs/output

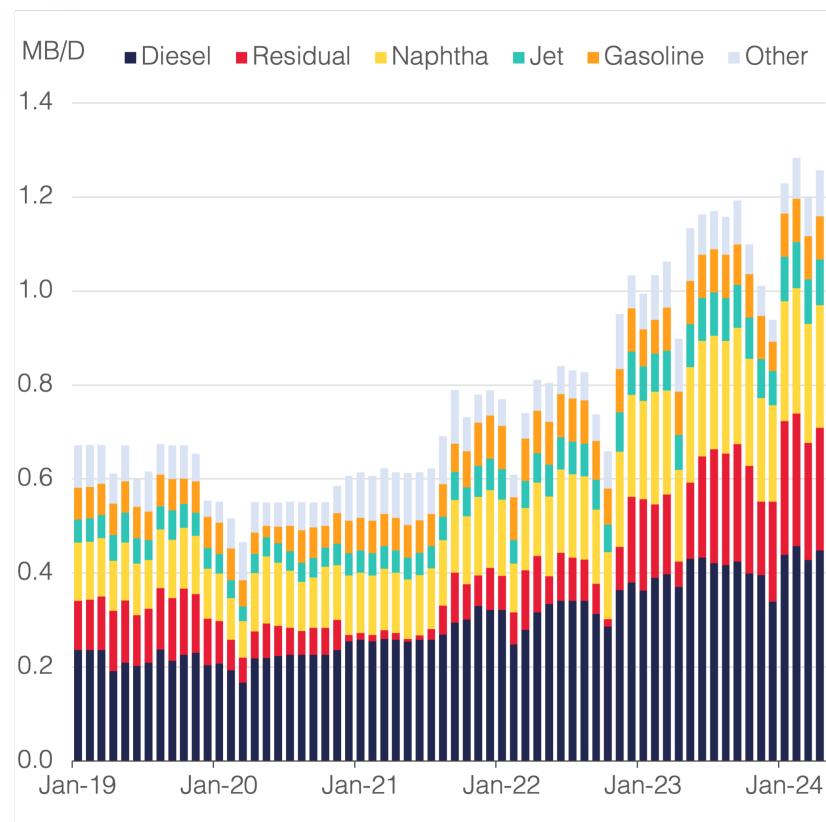
- The rise in products exports from Kuwait is led by increased runs the bulk of which originates from the Al-Zour refinery and as of 1Q24 involved primarily higher output of diesel +(125 kb/d), residual fuel (+260 kb/d) and naphtha (+100 kb/d).

## Kuwait refinery runs by refinery



Source: Kpler, OIES

## Kuwait refinery output



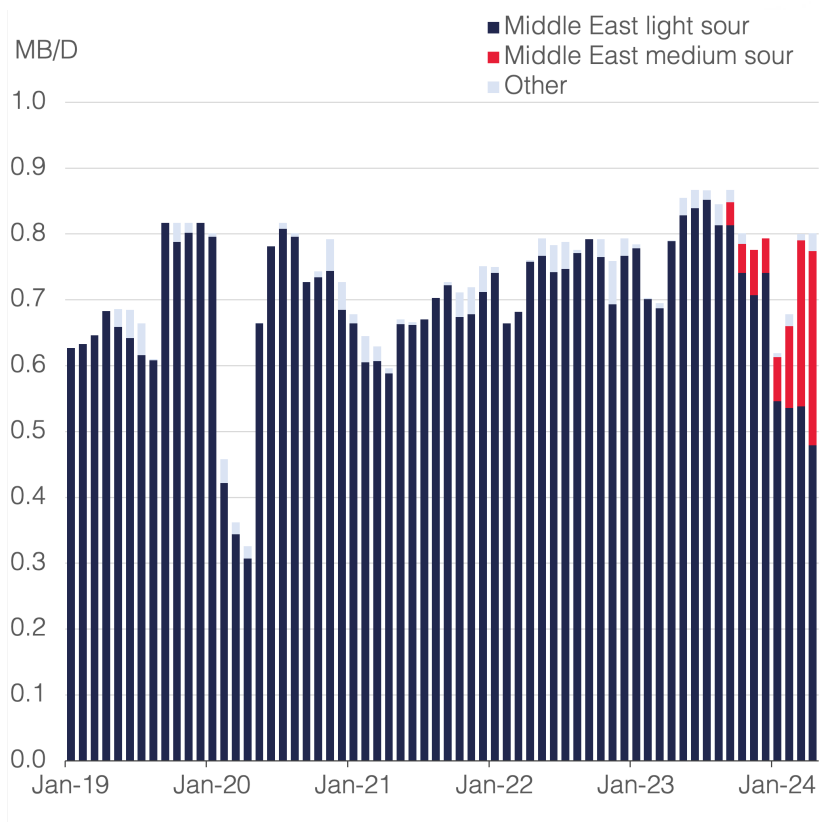
Source: Kpler, OIES



# UAE raises medium sour crude processing

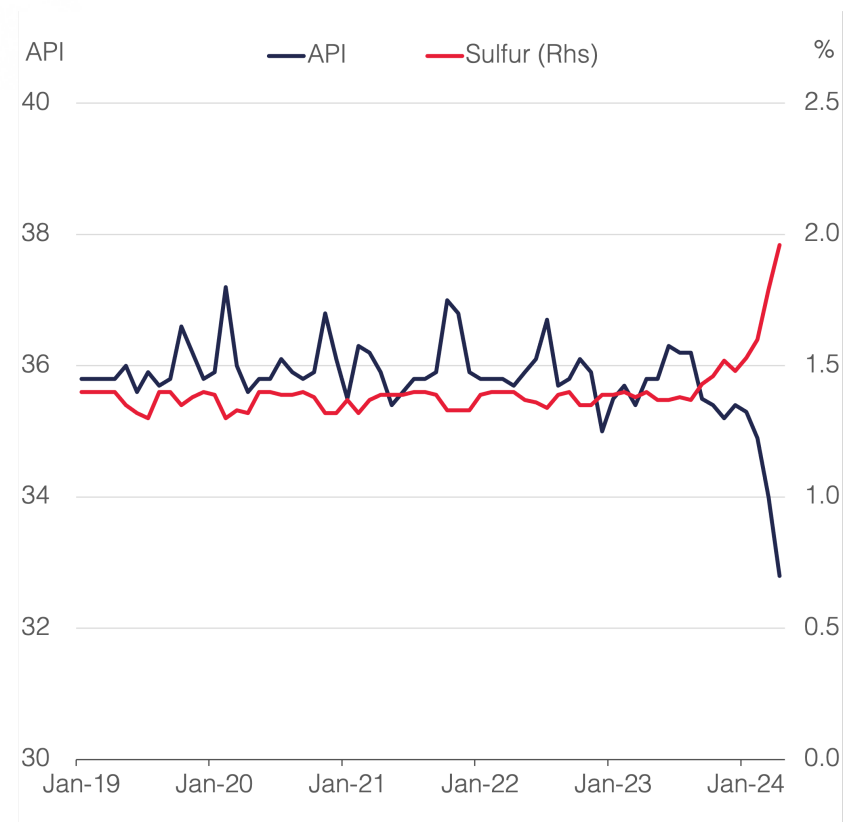
- The completion of ADNOC's Crude Flexibility Project (CFP) led to a significant rise in medium sour crude intake from Ruwais West refinery, taking mostly Upper Zakum although tests for other medium sour crudes were tried in recent months (e.g., Basrah Heavy).

## UAE refinery runs by crude quality



Source: Kpler, OIES

## Ruwais refinery runs by crude quality



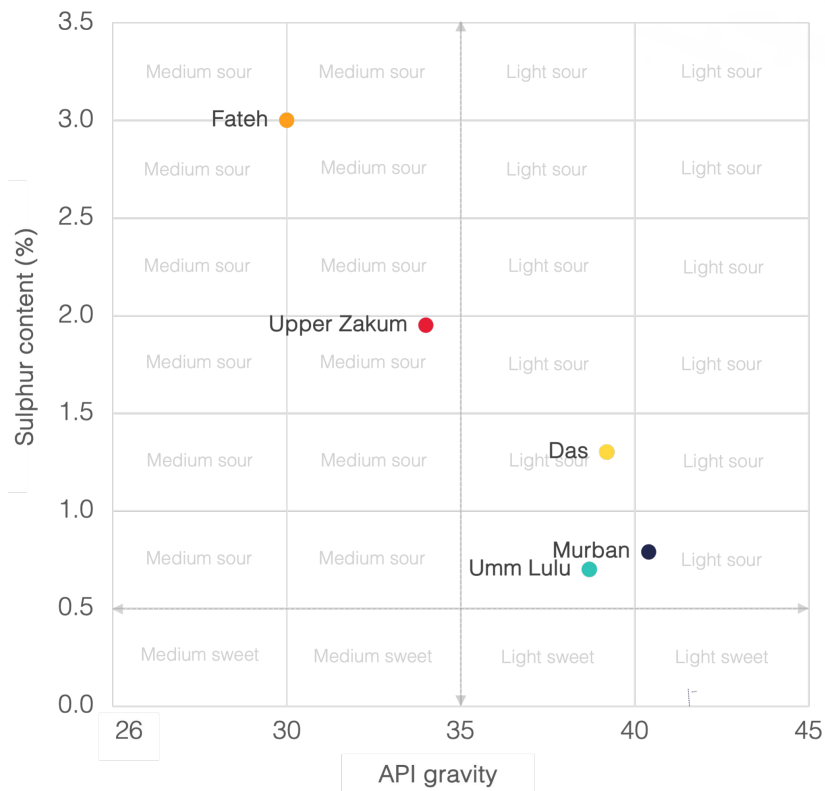
Notes: Weighted average.  
Source: Kpler, OIES



# Murban crude exports availability on the rise

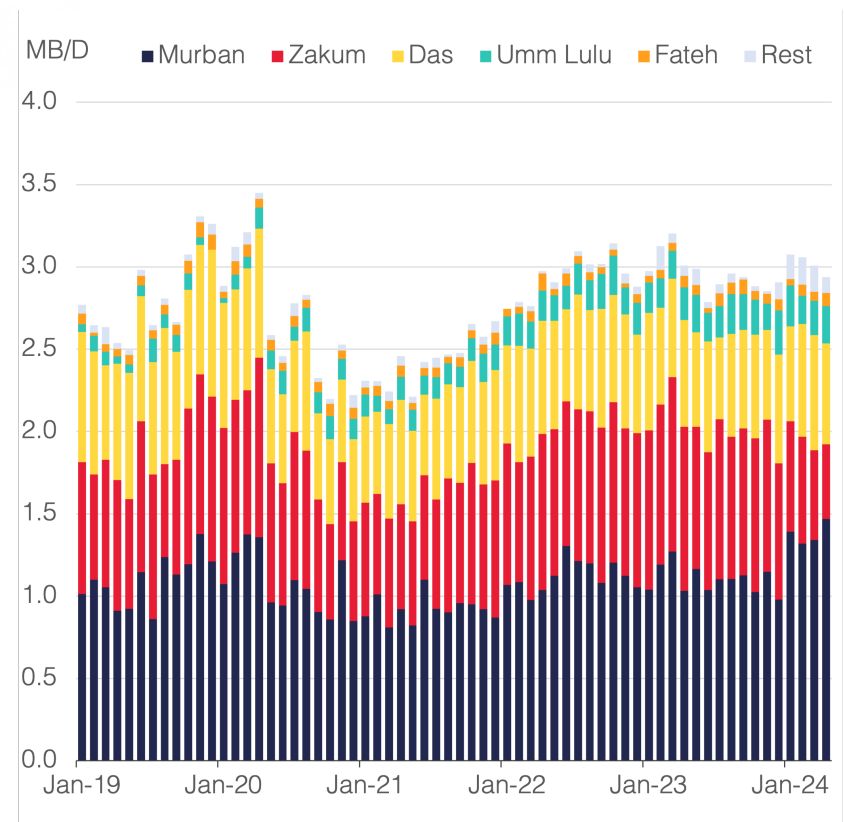
- The completion of the CFP has also enabled record volumes of light Murban crude oil to be exported, reaching near 1.5 mb/d in April from 1 mb/d a year ago (+430 kb/d y/y).

## Selected UAE crude grades



Source: US EIA, OIES

## UAE crude oil exports by grade



Source: Kpler, OIES

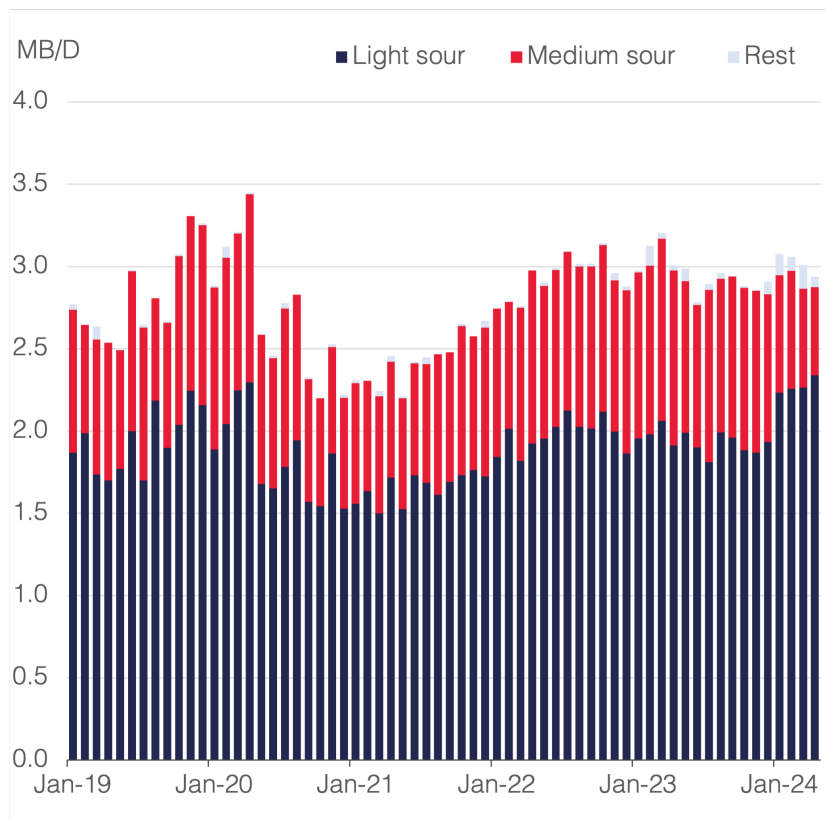




# Medium sour crudes under pressure

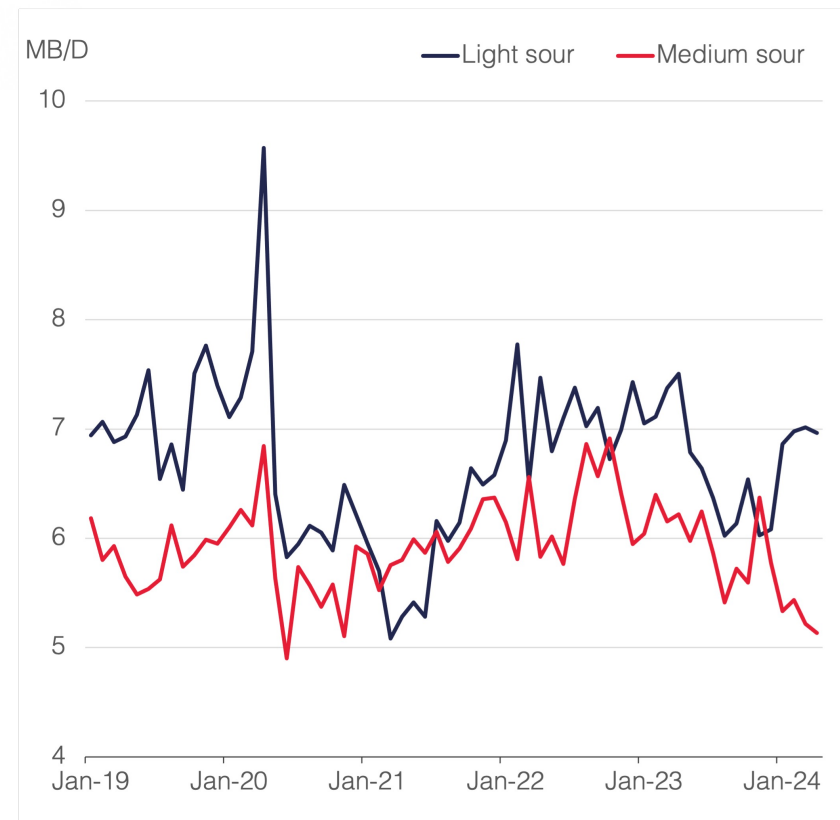
- GCC exports of attractive medium sour crudes nearly halved so far in 2024 compared to a year ago levels (Jan to Apr), falling to 600 kb/d from 1.1 mb/d.

## UAE crude oil exports by crude quality



Source: Kpler, OIES

## GCC crude oil exports by crude quality



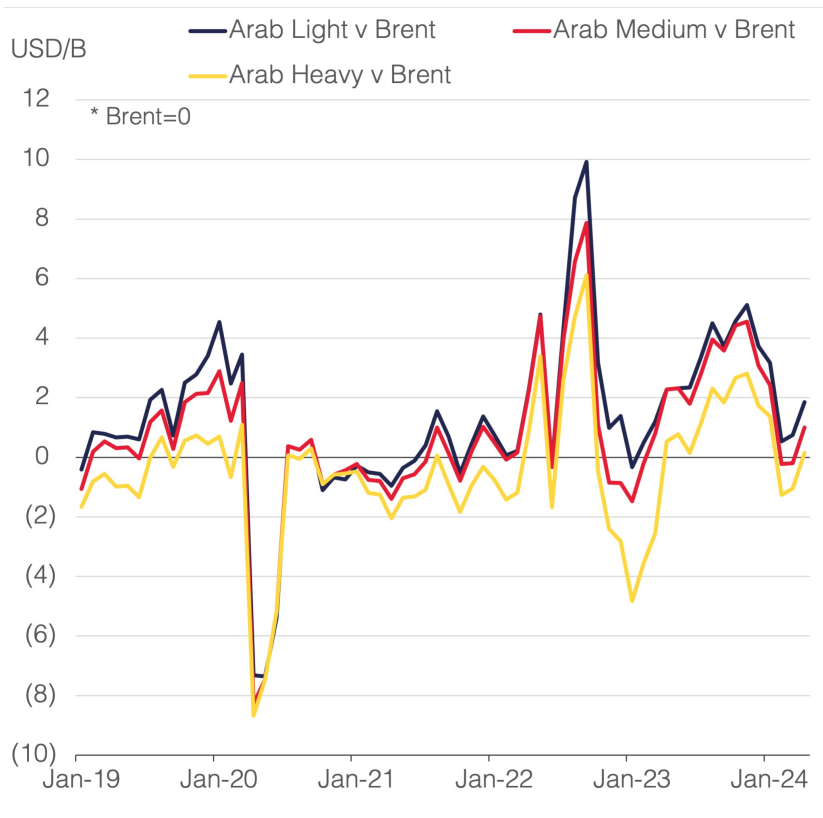
Source: Kpler, OIES



# Murban sets the Dubai basket price

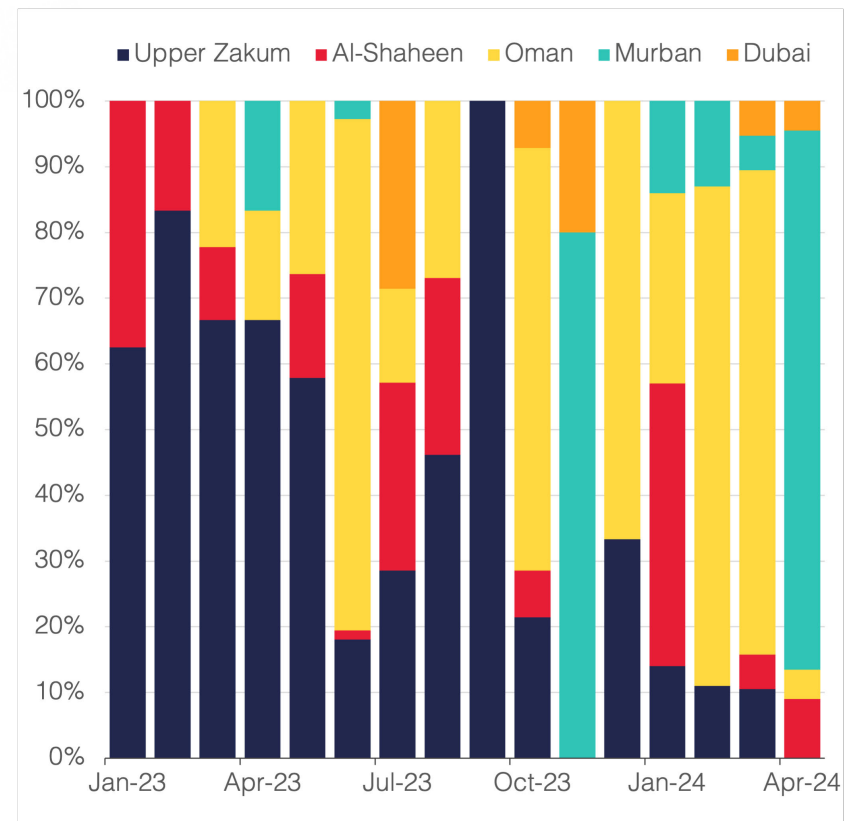
- The price of the Dubai basket that is set by the lowest priced crude in the basket, traditionally Upper Zakum and Qatar's Al-Shaheen that are heaviest grades than Murban, is now being frequently set by the better quality and lighter Murban crude as the lowest priced grade in the basket.

## Selected Saudi OSPs vs Brent



Source: S&P Global Commodity Insights, OIES

## Dubai window convergence by grade



Source: Renaissance Energy Advisors (REA), OIES

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# Implications on Middle East refined products exports

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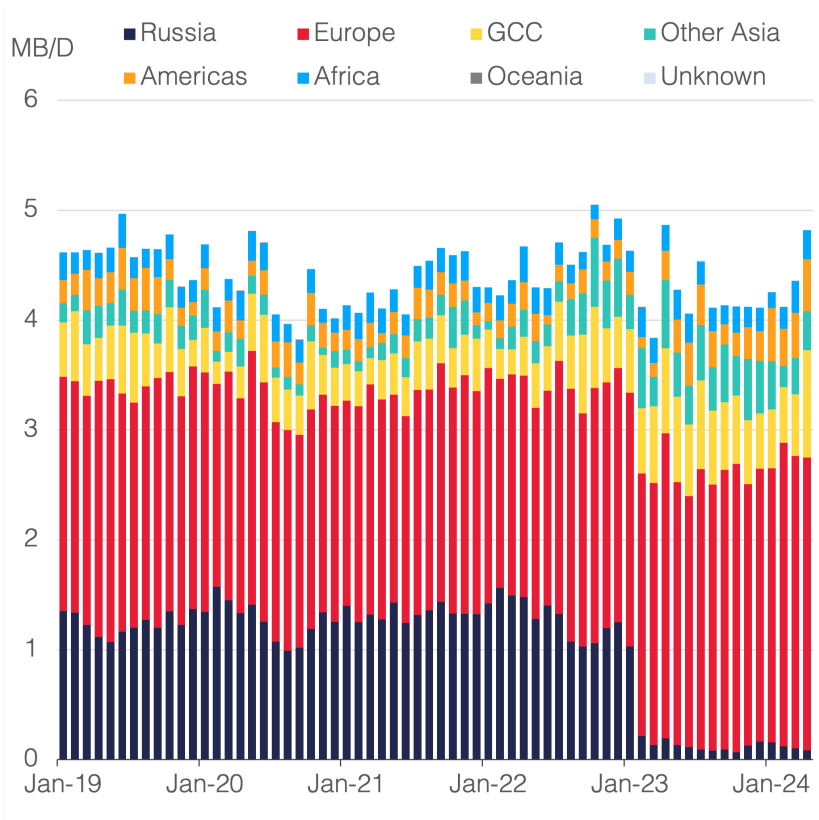




# Massive transformation to products trade flows

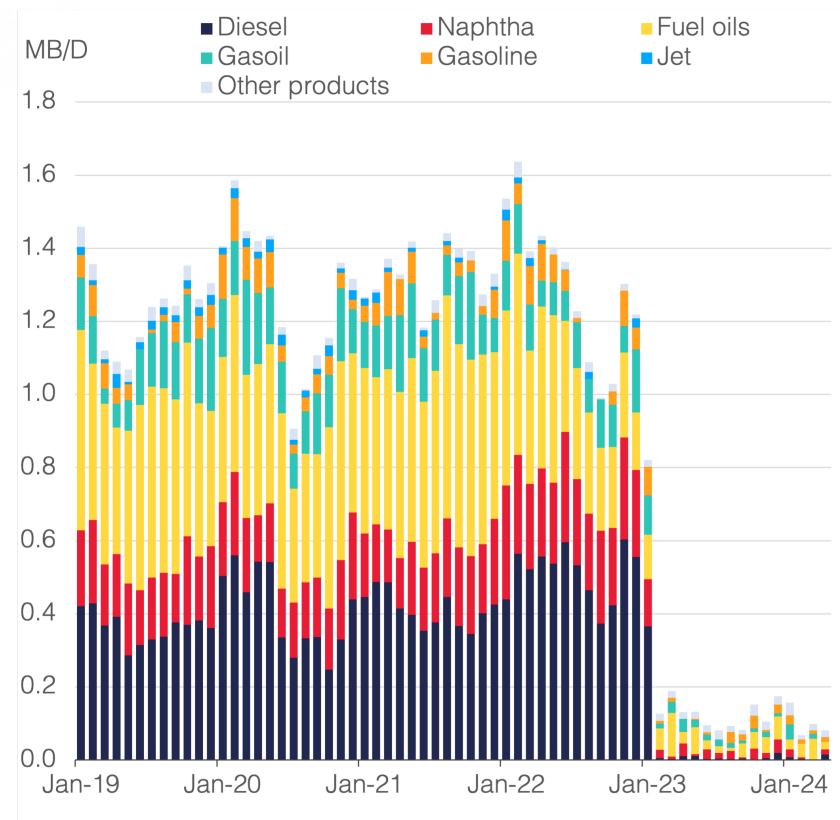
- Following the Russia-Ukraine war and EU embargo on Russian oil imports, products trade flows have also seen a massive transformation with Europe having to fill a 1.3 mb/d Russian import gap from far away alternative sources, 40% of which involved a gap in diesel imports.

## EU-27 product imports by origin



Source: Kpler, OIES

## Russia product exports to EU-27



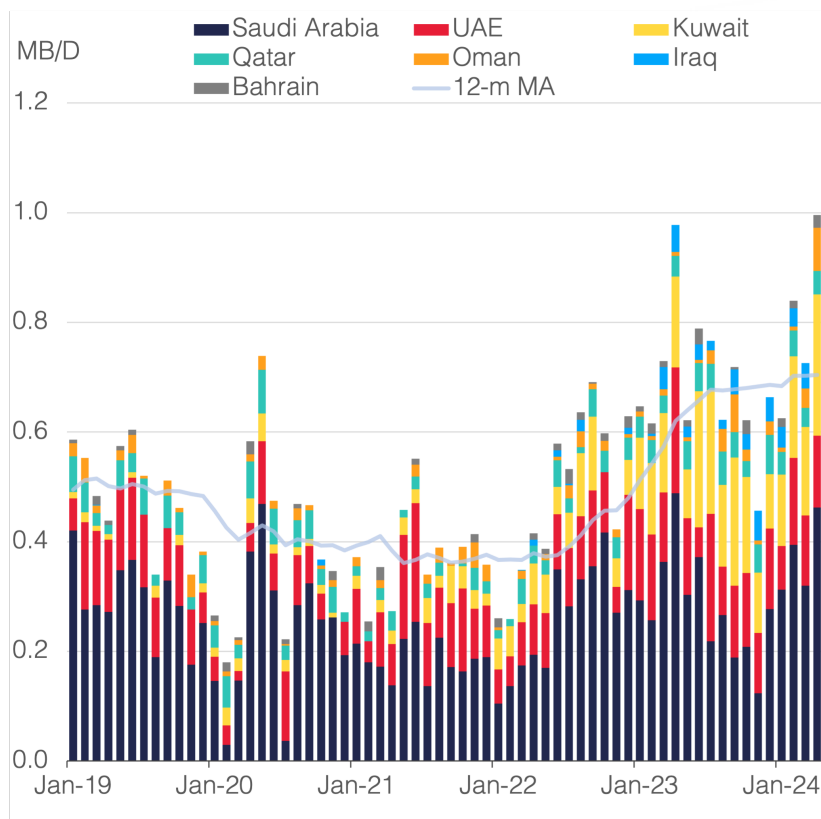
Source: Kpler, OIES



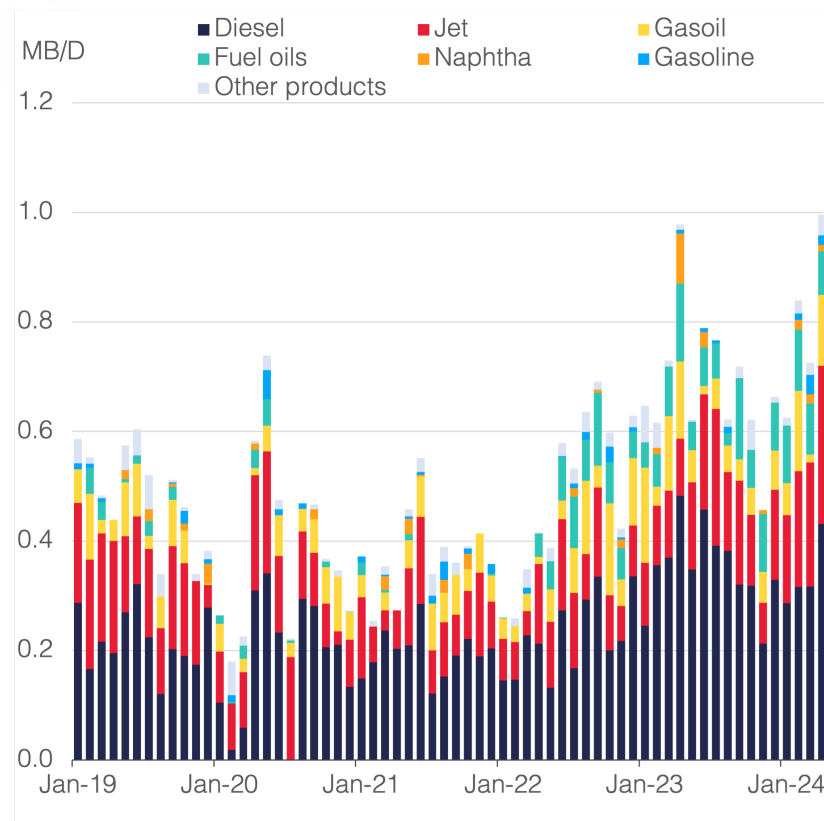
# GCC middle distillates shift towards Europe

- GCC exports of middle distillates to Europe have been on the rise reaching a record level of near 1 mb/d in April, with the growth dominated by refineries in Kuwait, Saudi Arabia and Oman.

## GCC + Iraq oil products exports to EU-27 by origin



## GCC + Iraq oil products exports to EU-27 by product

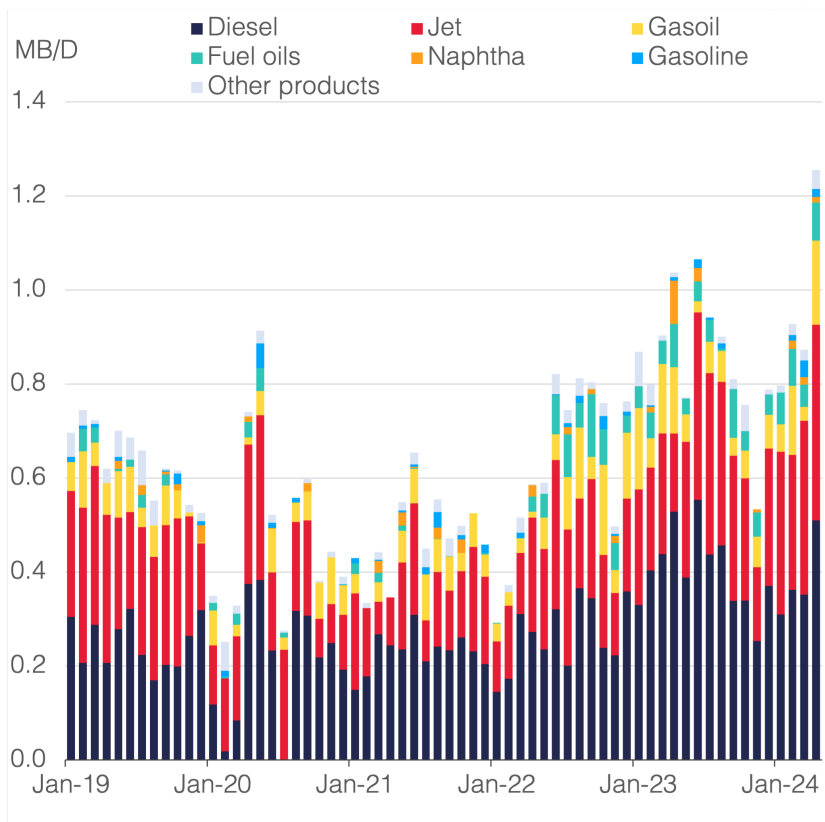




# Bigger footprint in Europe, more competition in Asia

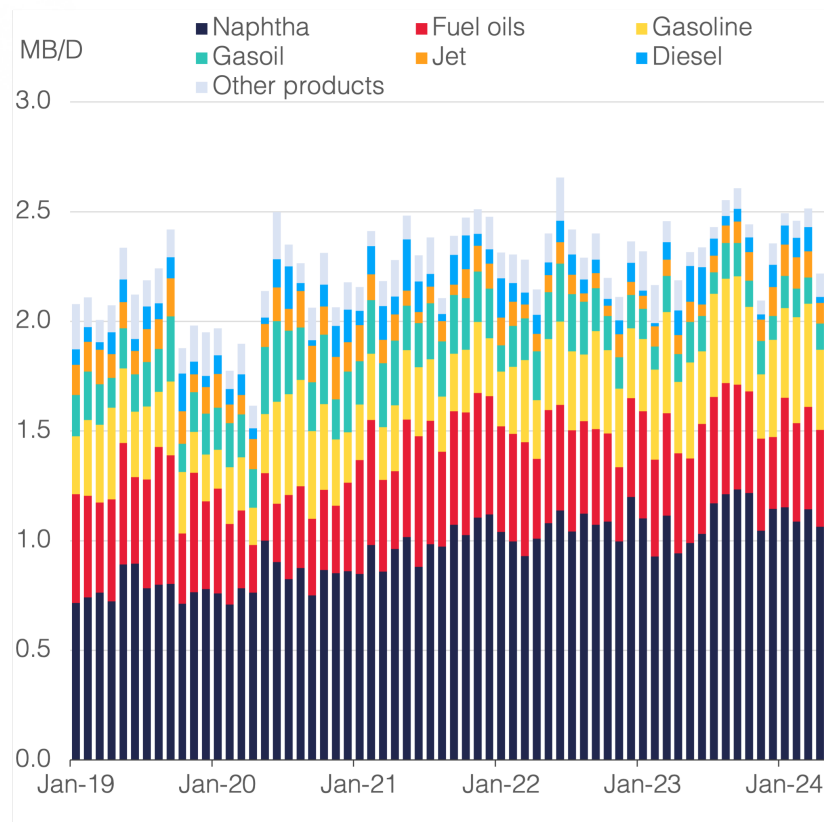
- GCC oil products exports are increasing to Europe, particularly of middle distillates, while they are maintained to Asia having to adjust to a more competitive environment.

## GCC oil products exports to Europe



Source: Kpler, OIES

## GCC oil products exports to Asia



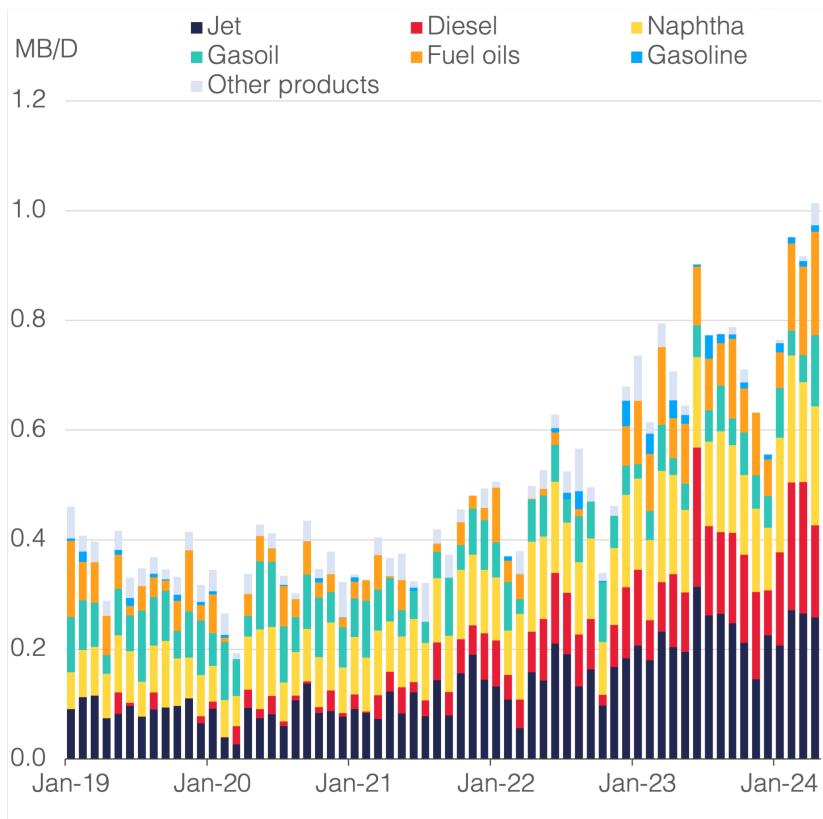
Source: Kpler, OIES



# Kuwait boosts middle distillates exports

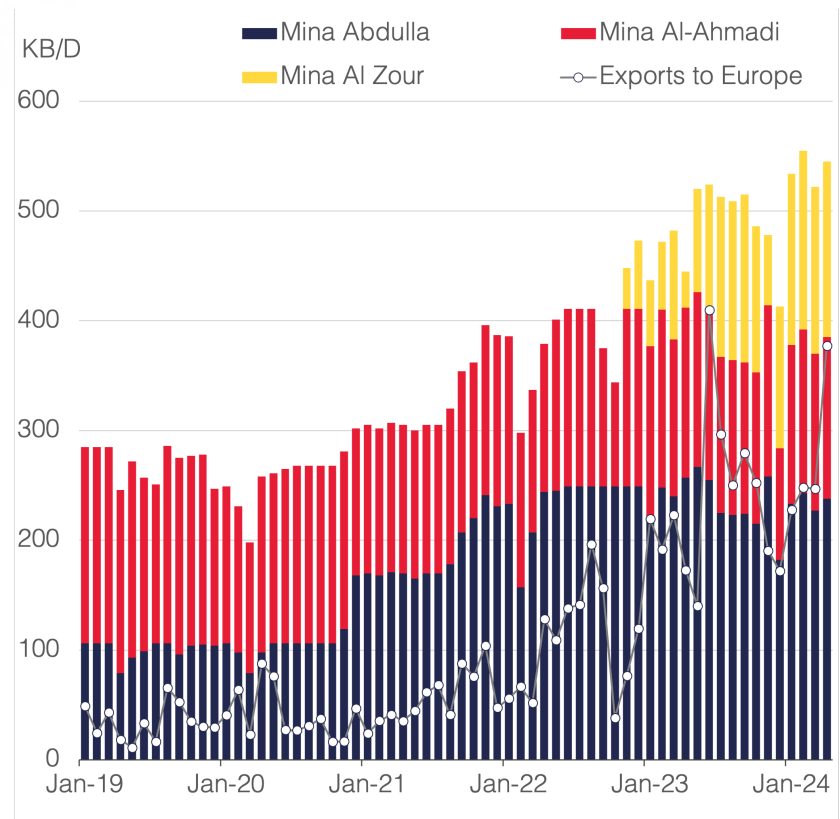
- The start-up of Al-Zour refinery in Kuwait has boosted the exports of middle distillates (diesel and jet) the bulk of which heads to Europe despite using the longer sea route via the Cape of Good Hope.

## Kuwait oil product exports



Source: Kpler, OIES

## Kuwait middle distillates output by refinery



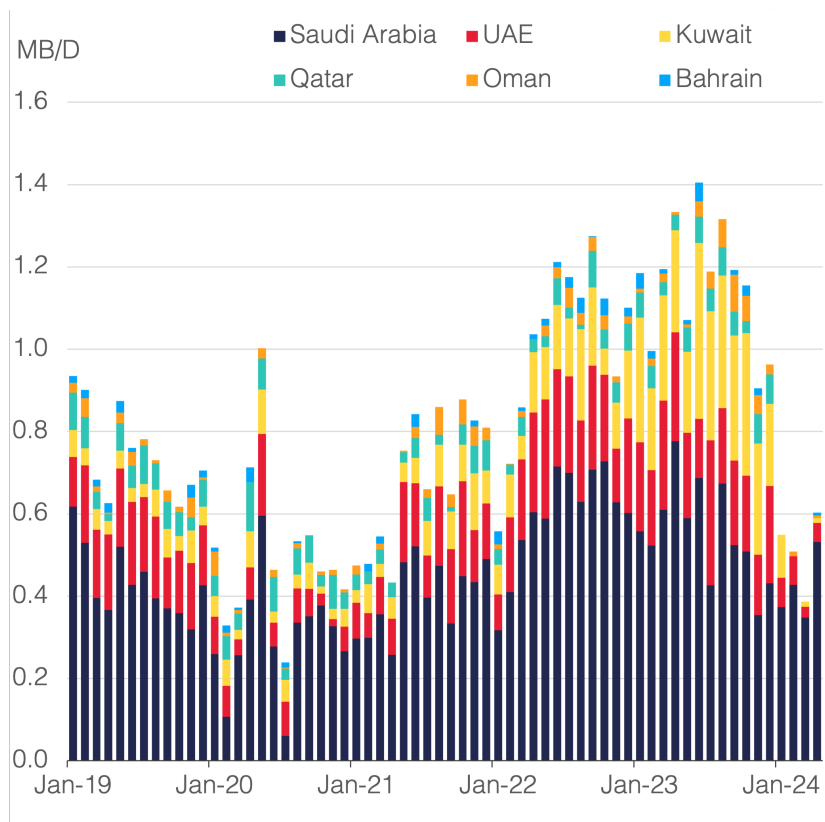
Source: Kpler, OIES



# Red Sea tensions limit the arbitrage from east-to-west

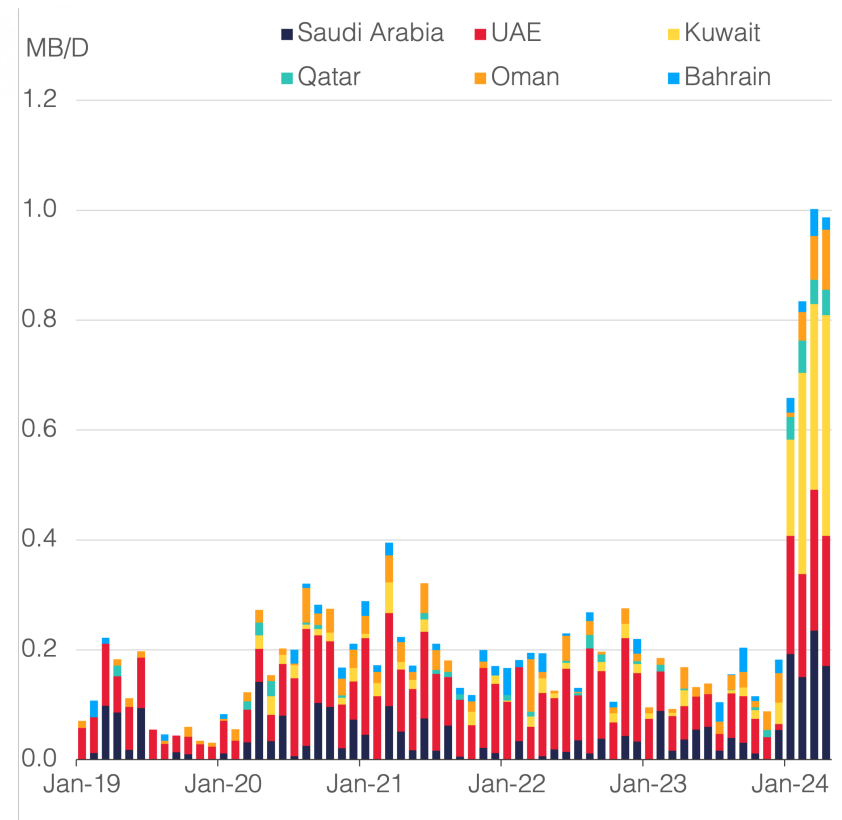
- The economics of shipping oil products from the Middle East to Europe is being challenged by exporters needing to use the longer sea route around the Cape of Good Hope.

## GCC product exports via Suez Canal



Source: Kpler, OIES

## GCC product exports via Cape of Good Hope



Source: Kpler, OIES

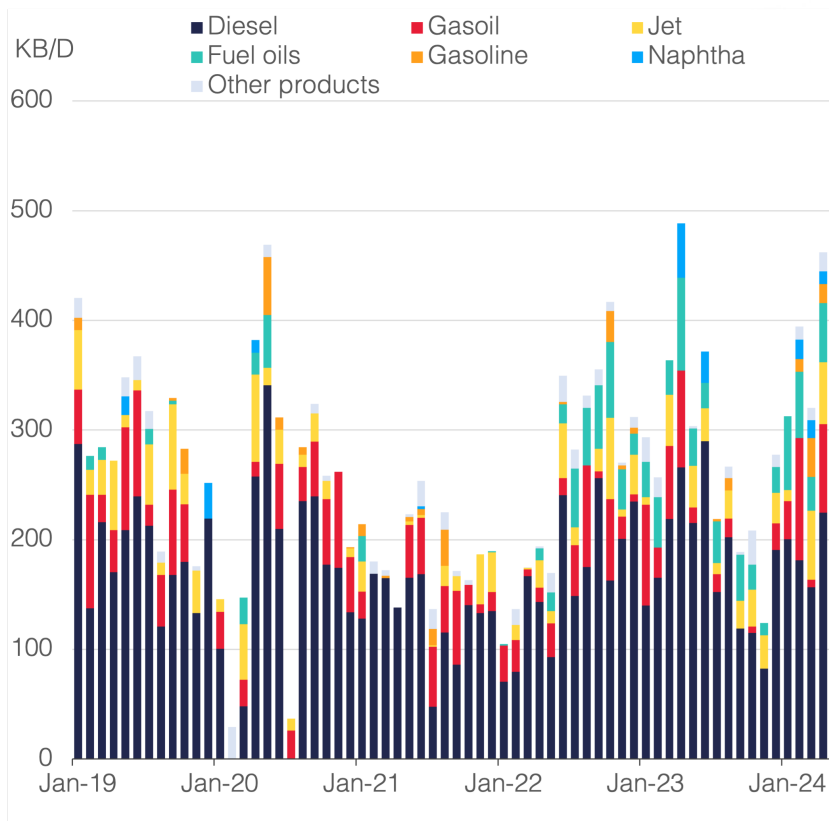




# Saudi Arabia a steady supply source to Europe

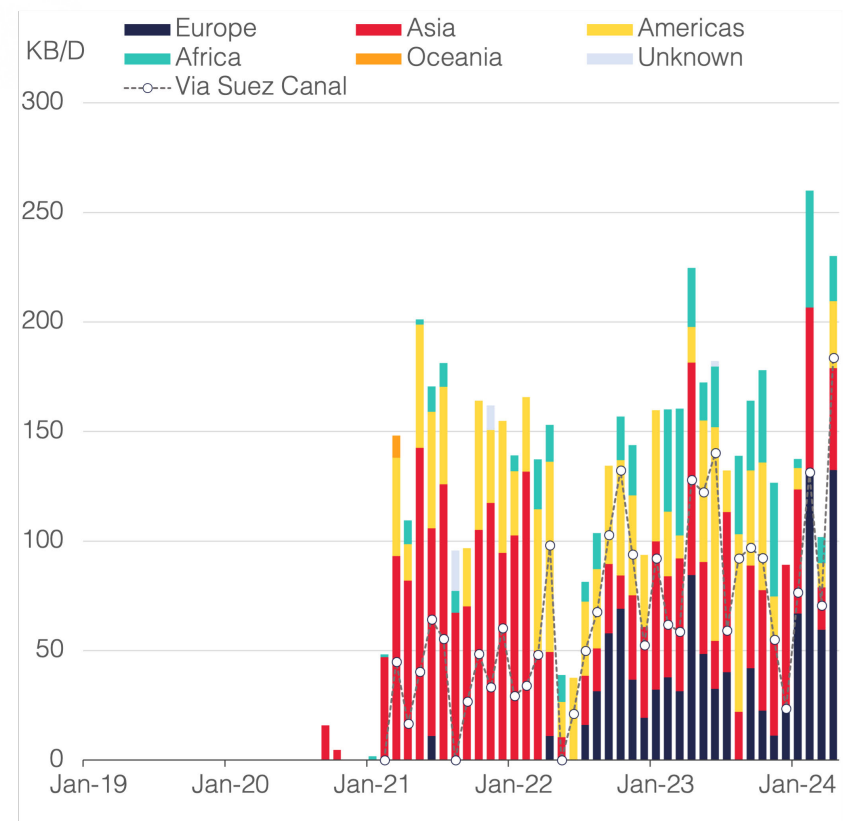
- Unlike Kuwait and Oman, the Saudi refineries located in the Yanbu refining hub on the Red Sea can avoid the threat of Red Sea attacks and taking the longer route, such as the Jizan refinery that exports directly to Europe albeit it still relies on tankers' deliveries from the Gulf.

## Saudi Arabia oil products exports to EU-27



Source: Kpler, OIES

## Jizan refinery exports by destination



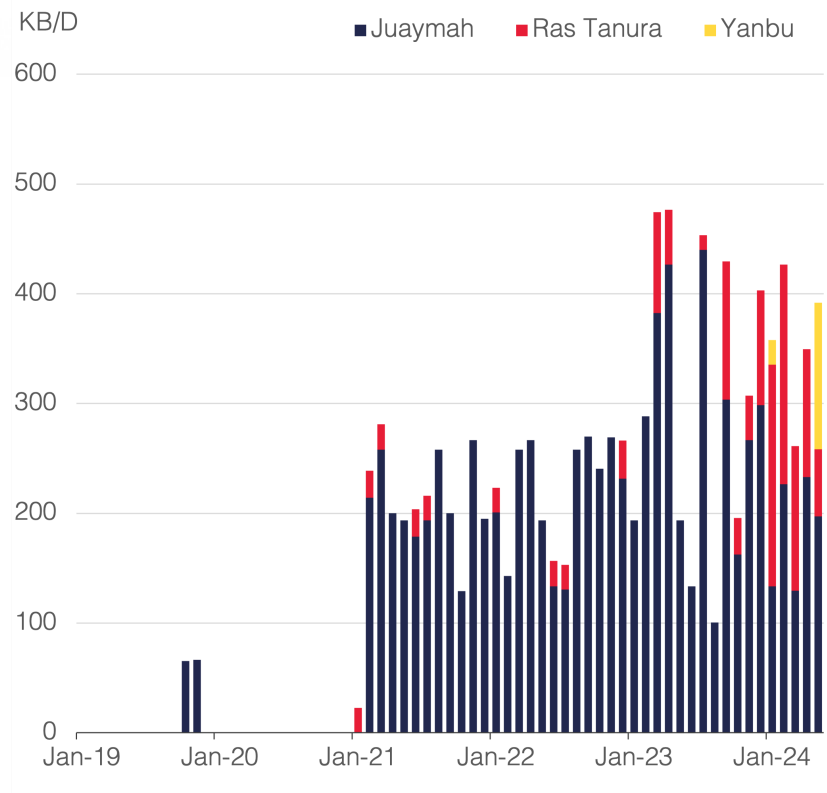
Source: Kpler, OIES



# New trend in Saudi intra-flows emerges

- To avoid the Red Sea tensions, Jizan in recent months has started receiving cargoes from Western facilities, adding to its typical Medium Arab diet a significant volume of lighter and heavier grades.

## Jizan refinery intra-country crude imports by origin installation



Source: Kpler, OIES



# Middle East exports weigh on European diesel cracks

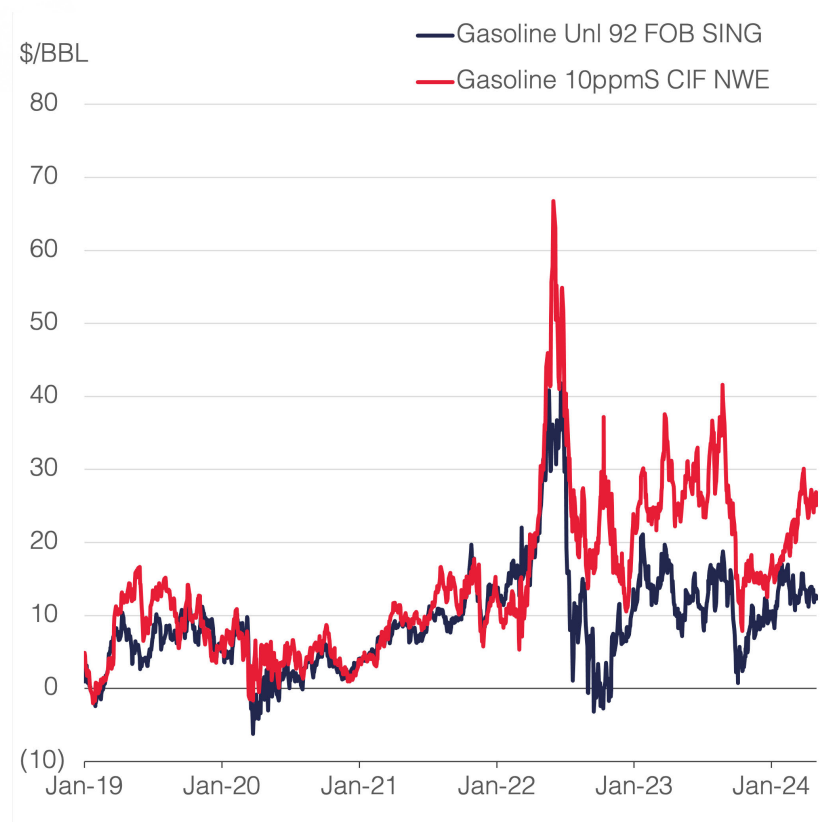
- Higher Middle East exports of diesel to Europe pressure cracks, with European diesel cracks in April slipping into a 10-month low despite the logistical problems for cargoes coming from east of Suez.

## Gasoil/Diesel cracks



Source: S&P Global Commodity Insights, OIES

## Gasoline cracks



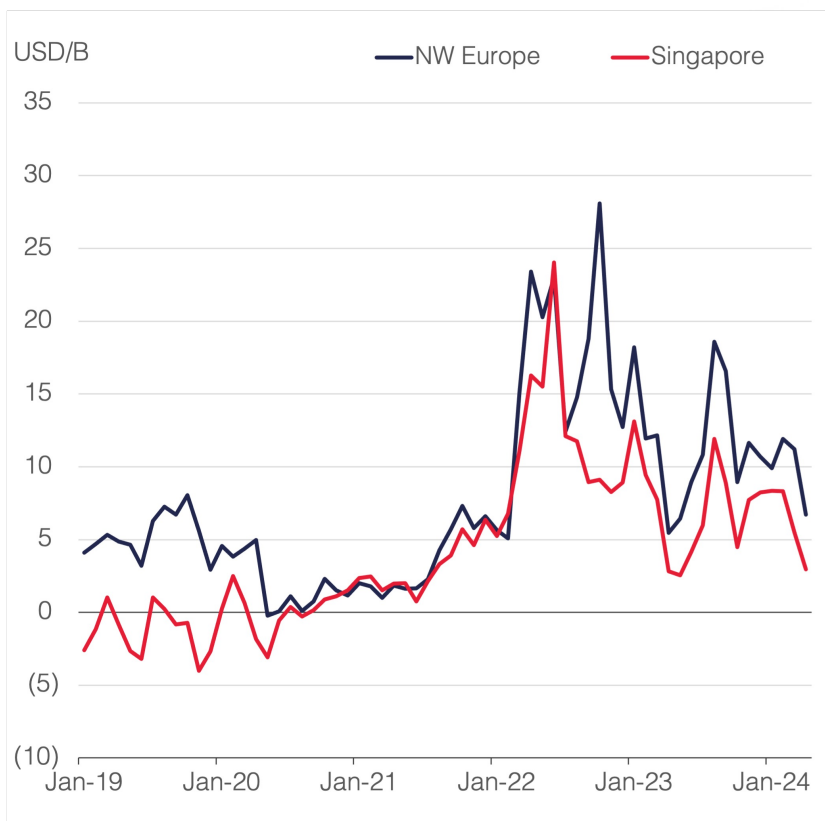
Source: S&P Global Commodity Insights, OIES



# Refining margins also weigh on arbitrage

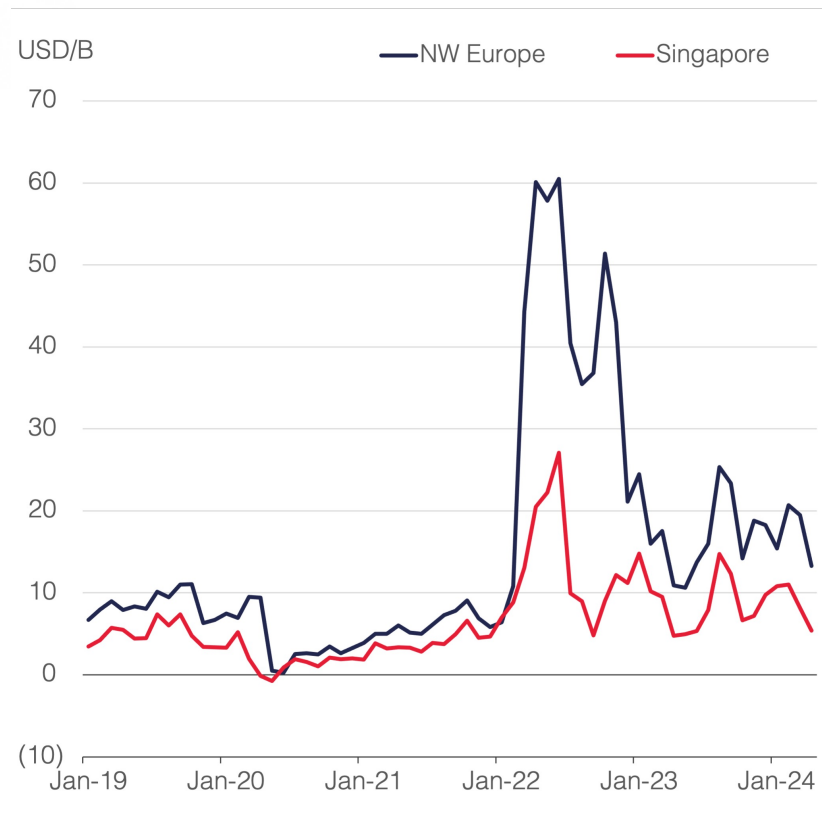
- Low refining margins and longer trade routes are also limiting the arbitrage from Asia putting pressure on Asian margins.

## Light sweet cracking margins



Source: IEA, OIES

## Medium sour cracking margins



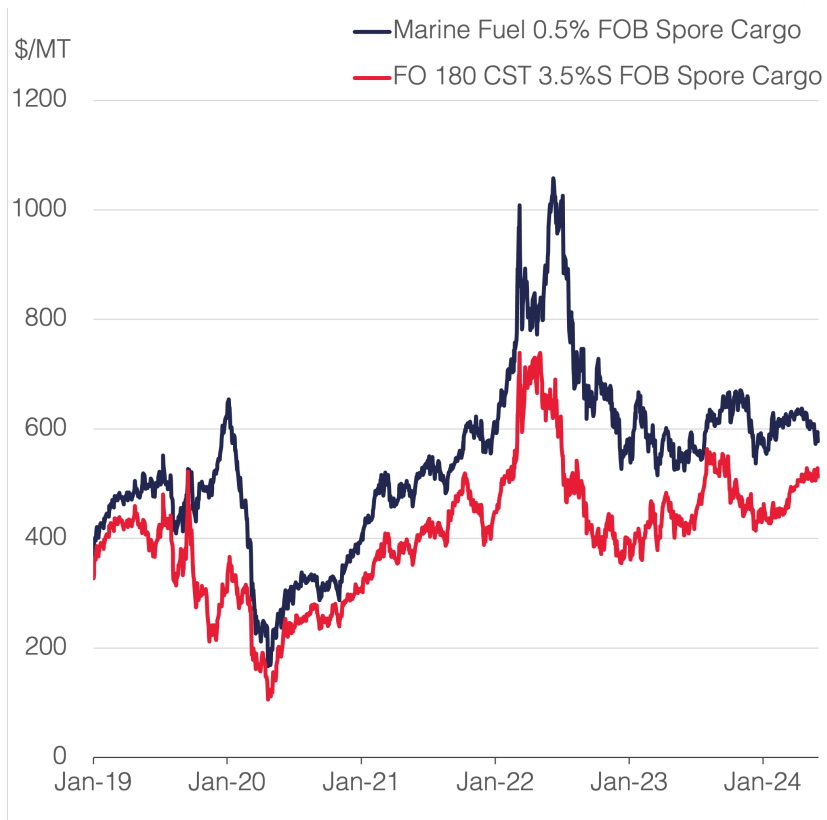
Source: IEA, OIES



# Red Sea tensions set stage for HSFO growth

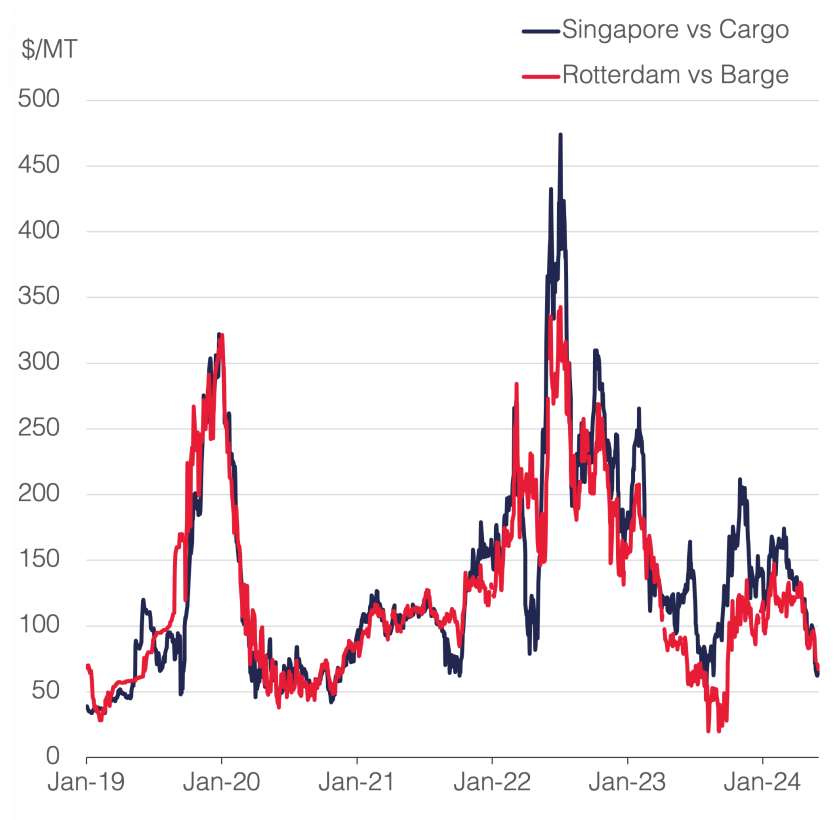
- Demand for cheaper, high-sulphur marine fuel (HSFO) has been bolstered by the lengthier long-haul journeys while the appetite for sweeter, and pricier, marine fuel (LSFO) has been comparatively subdued impacting the price differential between the two.

## FOB Singapore Fuel oil prices



Source: S&P Global Commodity Insights, OIES

## 0.5% Marine fuel vs 3.5% Fuel oil spreads



Source: S&P Global Commodity Insights, OIES



## Concluding remarks

- Russia-Ukraine war coincided with major changes in Gulf refining scene reinforcing some of the recent shifts in the crude and products trade flows.
- Gulf capitalized on some of these changes with a bigger footprint in Europe but had to adjust to a more competitive scene in Asia.

### **GCC crude exports to Europe:**

- Developments in Russia-Ukraine war intensify and implication on oil and products markets and trade flows are unlikely to be reversed anytime soon.
- Crude availability for exports versus more refined products will depend on new investment in expanding/upgrading refining capacity and investment in renewables that could free crude for exports to Europe.
- More active OPEC+ policy and new/upgrading refinery projects (e.g., Bahrain) to deal with more complex crude likely to continue freeing light sour crudes and restricting heavier sour crudes. OPEC+ latest decision could see more medium sour crudes arriving to the market from Q4.

### **GCC oil products exports to Europe:**

- Return of Russian products to Europe unlikely in the near future.
- Red Sea tensions to remain high risk (arbitrage from Asia easier).
- EU distillate demand to remain under pressure, but closure/conversion of EU refining capacity can continue to support margins.



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