



The EU Ban on Russian Oil: Crude Implications for the Middle East

By **Robin Mills** and **Ahmed Mehdi**

It has been over two months since the European Union (EU) ban on Russian crude oil¹ entered into force, triggering friction in oil markets and petroleum supply chains. The ban takes effect against major uncertainties, especially the speed and size of recovery in Chinese demand and the global economic outlook. Three key players each have decisions to make in response: Will the EU and US impose further restrictions on Russian oil (in addition to the price cap now in force for more than two months and the product ban that came into effect on February 5)? Will Russia be able and willing to redirect all or most flows from Europe to Asia in the face of the G7-inspired price cap and EU insurance ban? How will the oil policies of the Organization of the Petroleum Exporting Countries (OPEC), the group with 10 additional oil exporters (known as OPEC+), and Saudi Arabia evolve in response?

The Middle East, as the world's key oil-exporting region and leader, remains central to the market's reaction and outcomes. This three-part series covers crude oil (this commentary), refined oil products (Part 2) and geopolitical implications (Part 3) to understand the impact of the war on oil flows and pricing since February 2022 and to extract clues to the future reactions of exporters, traders, and refiners.

Six key conclusions emerge for crude oil:

1

Annual term contracts with Asian refiners will initially protect Middle Eastern exporters from Russian competition. But in the longer term, the Middle East has to consider how much it is willing to be displaced from core Asian growth markets into shrinking European markets – or, in the case of Iran, how to retain its sole remaining customer without further discounting.

This commentary represents the research and views of the authors. It does not necessarily represent the views of the Center on Global Energy Policy. The piece may be subject to further revision.

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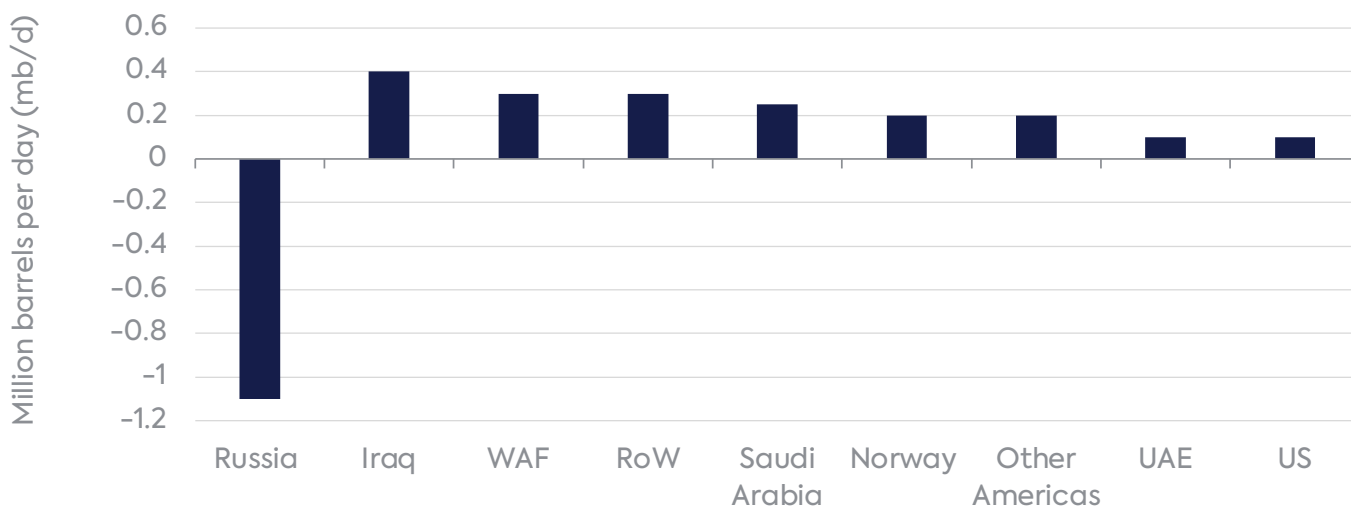
- 2 Asia – overwhelmingly India and China – has become the main sink for sanctioned crudes, giving it the ability to extract sizeable discounts from Russia.
- 3 Diesel-rich, lower-sulphur crudes have benefited disproportionately in sales to Europe, benefiting Saudi Arabia in particular. But the disappearance of Russia’s main grade, Urals, from Europe creates a puzzle for Middle Eastern exporters as to how to price their European sales.
- 4 Middle Eastern petroleum exporters have gained overall from the Russia shock, mainly in the form of higher prices. They have also benefited from opportunities to refine, store, and redistribute Russian crude and can continue to benefit from them going forward.
- 5 The core Gulf exporters will be balancers-in-chief in Europe.
- 6 The Middle East, and the OPEC+ relationship, will be critical to Russia’s strategic resilience.

The First Reshuffle

Prior to Russia’s invasion of Ukraine on February 24, 2022, Urals²—Russia’s key crude export grade—served as a baseload for Europe’s refineries, with Russian crude historically making up around 20 percent of Europe’s crude diet. Prior to the EU’s December 2022 ban, refiner self-sanctioning played a significant role in driving down Russia’s exports to Europe. Between March and November 2022, Russian crude exports to the EU averaged approximately 1.78 million barrels per day (Mb/d), roughly 0.7 Mb/d lower than the January–February 2022 (preinvasion) average and 0.3 Mb/d lower than the 2021 average.

During 2022, as a replacement, the EU turned to a variety of sources, particularly the Middle East, West Africa, the US, and Norway. The role of West African producers, such as Nigeria, as “swing” players (given their ample spot liquidity and destination-free status) enabled traders to redirect their volumes to Europe flexibly; likewise, Norway’s Johan Sverdrup, a key Atlantic grade that was previously often exported to China, is now staying local to be bid on by European refiners, as the medium-sour grade is a healthy substitute for Urals.³ The EU’s overall crude intake actually increased with ongoing demand recovery and higher runs on the back of strong middle distillate refining margins.

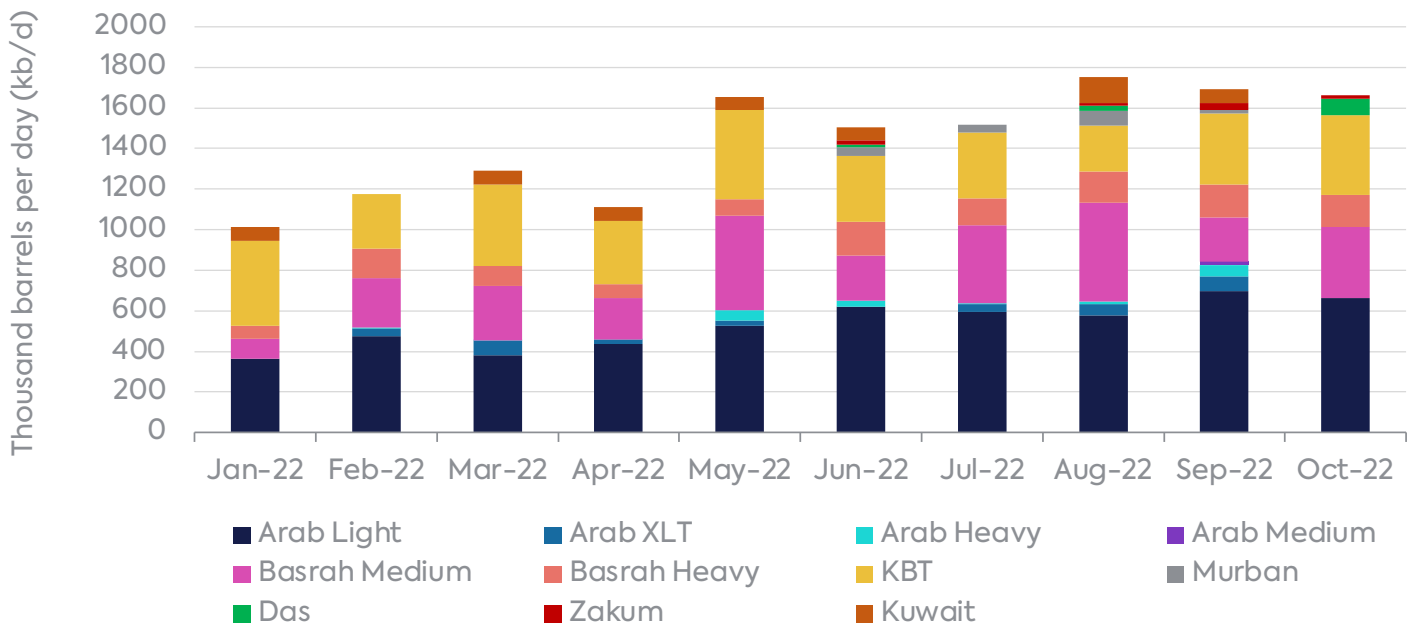
Figure 1: EU imports from selected countries (October 2022 average vs. January-February 2022 average)



Source: Kpler Terminal, accessed November 25, 2022.

Among the key Middle Eastern players, Iraq and Saudi Arabia have made the biggest inroads, primarily via their grades of Basrah Medium⁴ and Arab Light,⁵ respectively (see Figures 3 and 4). Although not an exact match for Urals, Arab Light in particular has benefited from a higher yield of diesel and lower fuel oil yield (see below). Production targets under the OPEC+ agreement⁶ (grouping OPEC, Russia, and several other non-OPEC states) steadily increased between May 2021 and when the cuts were introduced in October and November 2022.⁷ Kurdish Blend Test (KBT),⁸ exported by the Kurdistan Region of Iraq, has made the least inroads, partly due to internal Iraqi politics⁹ and partly because of competition from Russian crude in the Mediterranean, which will ease now that the EU ban is in force.

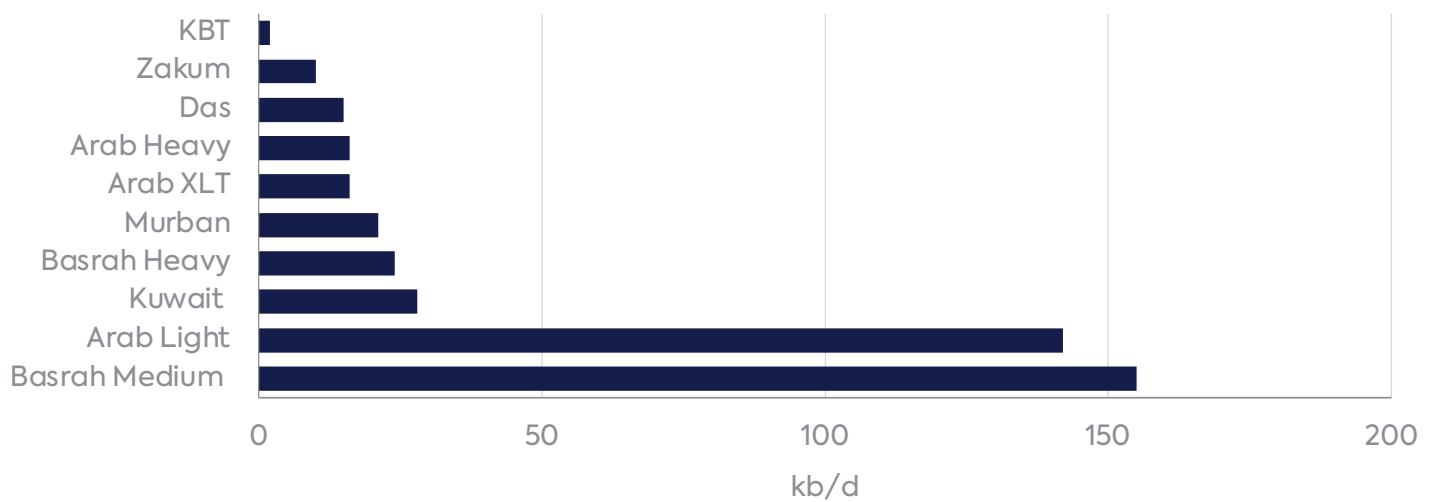
Figure 2: EU imports of Middle Eastern crude by select grade



Note: Includes volumes from Sidi Kerir for re-export.

Source: Kpler Terminal, accessed November 25, 2022.

Figure 3: EU imports of Middle Eastern crude by select grade (post-invasion average vs. pre-invasion average)

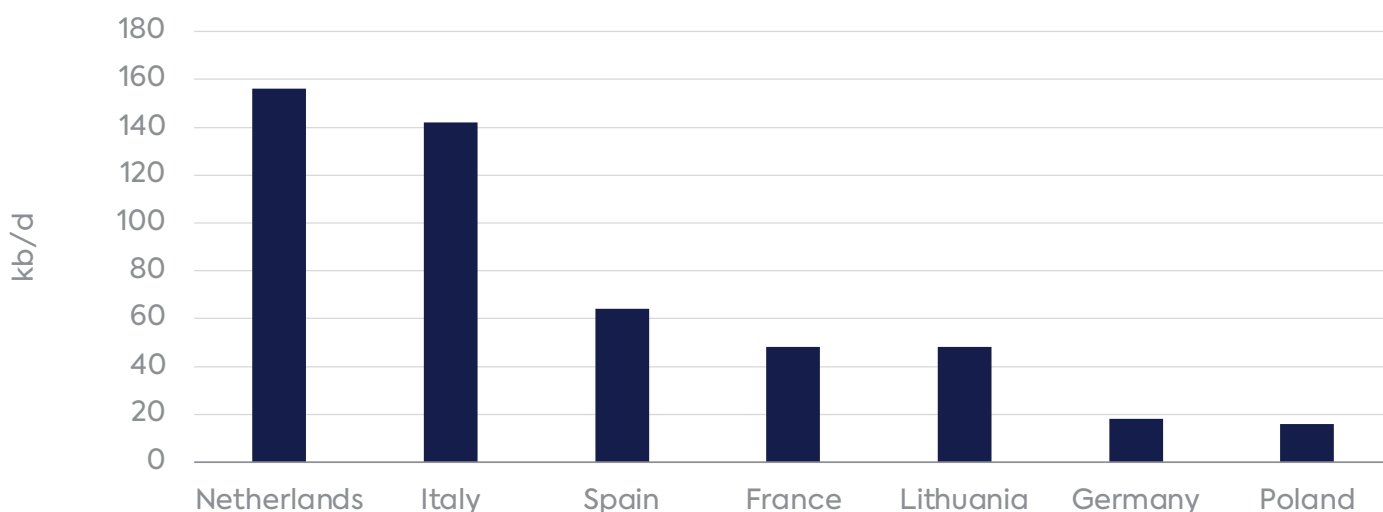


Note: Post-invasion refers to March–October 2022; pre-invasion refers to January–February 2022.

Source: Kpler Terminal, accessed November 25, 2022.

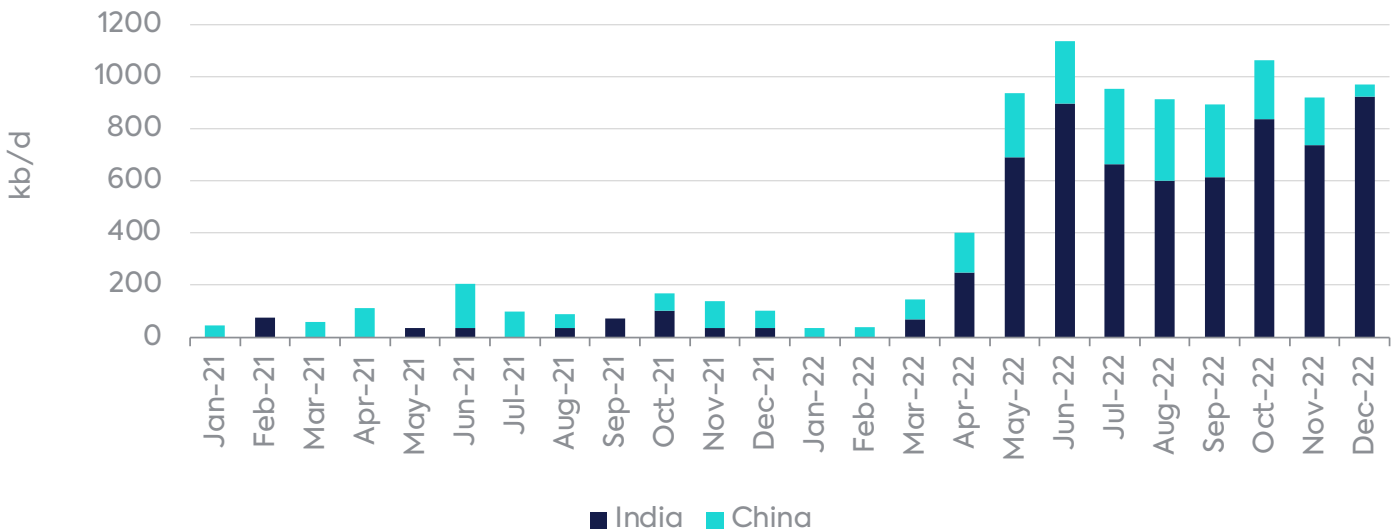
As Figure 4 shows, the largest markets where Middle Eastern crude has increased market share are Italy, the Netherlands, Lithuania, and Poland—the latter a country of strategic focus for Saudi Aramco, which has expanded its downstream footprint there in recent years.¹⁰ Iraq, which supplied around 600 kb/d of crude under term contracts to Europe prior to the invasion, has also increased market share in Italy, particularly with Italian refiner Saras, a major term client of Iraq’s State Oil Marketing Organisation (SOMO).¹¹ An additional outlet for Middle Eastern crude in Italy may reopen when the status of the ISAB refinery in Sicily, owned by Russian company Lukoil, is resolved. ISAB ramped up its purchases of Russian crude following the start of the war, but after the Italian government intervened to assure continuity of supply following the EU ban, ISAB was sold to a private equity group backed by the trading company Trafigura.¹²

Figure 4: Middle East crude exports to the EU by destination (post-invasion average vs. pre-invasion average)



Source: Kpler Terminal, accessed November 25, 2022.

The increases in Saudi and Iraqi exports to Europe were driven not only by the easing of OPEC+ cuts throughout 2022 but also by the displacement effect of increased Russian Urals heading to Asia since the outbreak of the war (see Figure 5).

Figure 5: Urals crude exports to Asia

Source: Kpler Terminal, accessed January 8, 2023.

This redirection of Urals to Asia has had numerous effects on Middle Eastern players, most importantly:

- Displacement from Asian and other markets:** Middle Eastern crude was displaced in three key markets: India, China, and Turkey, which, for the purposes of this discussion, are considered separate from Asia, Europe, and the Middle East. India, where approximately 450 kb/d of imports were cut (March–October 2022 versus January–February 2022 average), was the most important in this regard. For India’s private refiners, which buy Russian crude on a delivered basis (avoiding the need to arrange insurance), the attractive pricing of Urals played a major role. Nevertheless, state-owned Indian refiners such as Indian Oil Corporation and Bharat Petroleum and privately owned market leader Reliance¹³ have a string of annual term contracts with key players such as Iraq, Saudi Arabia, and the United Arab Emirates (UAE), placing an effective ceiling on Russia’s ability to displace Middle Eastern crude from India’s refining slate radically.

Chinese buying patterns are similar. Most incremental purchases of Russian crude from China, up to an additional 300 kb/d of Urals, have been made by private independent refiners. In turn, their crude requirements have been limited by restrictions on product export quotas and weak domestic demand amid COVID-related lockdowns that continued until December 2022.¹⁴ Concerns have also been growing among Chinese private refiners about the credit profile of the new breed of trading houses marketing Russian crude,¹⁵ as major trading firms have exited. Likewise, key Chinese state-owned players such as China National Offshore Oil Corporation and China International United Petroleum and Chemical Co (UNIPEC) highly prize their term

contracts with Middle Eastern players. Indeed, UNIPEC—one of the most active players in the Middle Eastern spot market—was previously burnt when it tried, to its detriment, to pressure Saudi Aramco on its term pricing in 2018, cutting the Saudi giant by 40 percent in certain months¹⁶—an event met with disbelief by most Asian players at the time. This came at a time when Washington–Beijing trade tensions might have limited Chinese purchases of US crude, Libyan supplies were at risk from insecurity, and the Trump administration was tightening sanctions on Iran, all of which threatened UNIPEC’s alternative supplies and reemphasized the importance of access to stable Gulf Corporation Council volumes.

Saudi Aramco’s long-term contracts typically allow for monthly changes of up to plus or minus 10 percent—a clause known as “operational tolerance,”¹⁷ usually for refinery maintenance or seasonal purposes. The UAE’s Abu Dhabi National Oil Company (ADNOC) adjustment is lower, at 5 percent.¹⁸ These tolerances allow some cuts on term liftings to accommodate additional Russian purchases but only to a limited extent. The major players in India, China, and other leading Asian markets will likely wish to renew most of their term contracts given that their refineries are optimized for Middle Eastern crudes, they have good long-term relations with their Middle Eastern suppliers, and they would be wary of overdependence on a volatile supplier such as Russia. Some inducements may be on offer in terms of shipping/freight adjustments.

The third major party in stepping up Russian crude imports is Turkey. The main refiners, Tüpras and STAR (State Oil Company of the Republic of Azerbaijan [SOCAR] Turkey Aegean Oil Refinery), owned by Azerbaijan’s state company SOCAR, increased purchases of Urals and Siberian Light grades, with average Turkish import volumes from Russia rising from about 100 kb/d before the war to 300 kb/d currently. The main Middle Eastern country affected by this development was Iraq (including the Kurdistan region), whose sales to Turkey were cut, as were exports from Johan Sverdrup (Norway) and West Africa.

- **Pressure on Middle Eastern spot pricing:** Growing volumes of Russian Urals to Asia and other non-European markets have also put pressure on the valuations of Middle Eastern spot crudes. Middle Eastern national oil companies (NOCs) price their crude to Asia under official selling prices (OSPs), defined as a fixed per-barrel monthly premium or discount to a reference. This benchmark is typically Dubai, made up of a basket of Middle Eastern spot crudes (namely, Dubai, Oman, the UAE’s Murban and Upper Zakum, and Qatar’s Al Shaheen).¹⁹ One impact of the growing flow of Russian crude to Asia has been the flattening of the forward curve for Dubai. In other words, the spread between the prompt Dubai contract and futures two months ahead (otherwise known as the Dubai M1–M3 spread) reduced as increased Russian crude headed to Asia, Chinese demand weakened, and more Russian fuel oil was redirected East of Suez (hitting the pricing of Middle Eastern crudes with a high fuel oil yield). The increased pressure on the medium sour market in Asia was also reflected in the widening spread between Saudi Arab

Light and Arab Medium OSPs (Arab Medium is similar in quality to Urals). Between January and July 2022, the differential between the two averaged USD \$0.10 per barrel (b), but as more Urals headed to Asia and weak demand in China continued, the spread widened dramatically to an average of USD \$2.1/b between August and October 2022. This benefited some of the most complex refineries in Asia (particularly those in India and South Korea), which can convert more of the medium- and heavy-gravity crudes to valuable products such as diesel.

Figure 6: Dubai M1–M3 spread



Source: S&P Global Commodity Insights, accessed January 8, 2023.

Figure 7: Saudi Arab Light vs. Arab Medium OSP to Asia



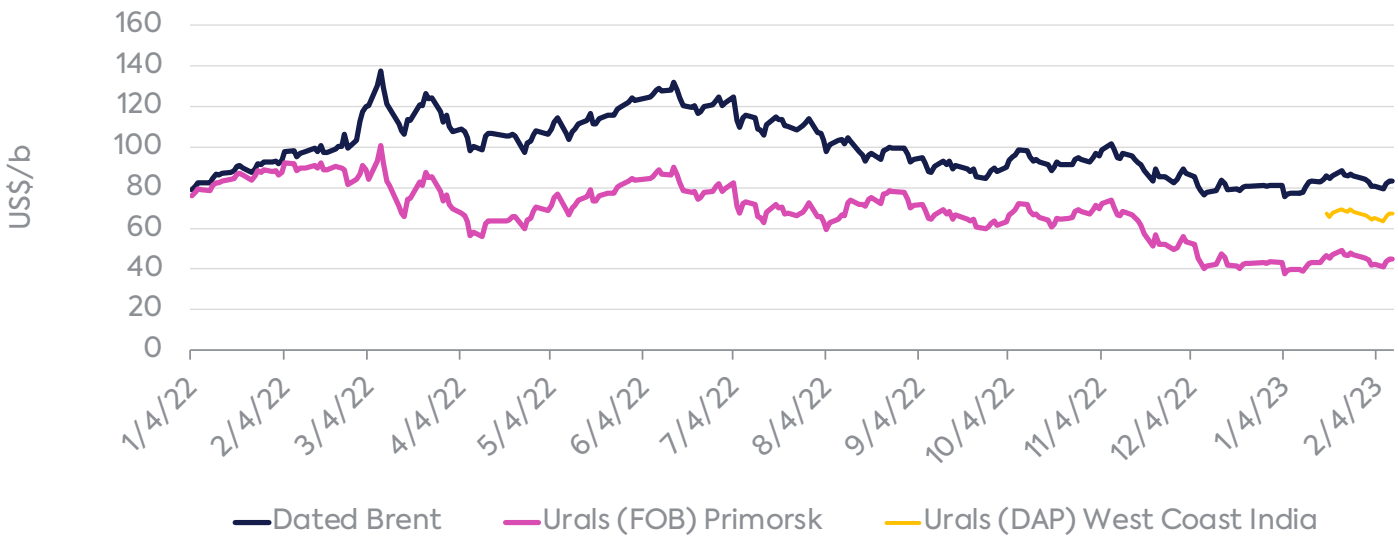
Source: S&P Global Commodity Insights, accessed January 8, 2023.

The Next Wave

Since the EU embargo on Russian seaborne crude imports, most Russian crude entering Europe has been via pipeline (estimated to be around 700 kb/d) in addition to a small amount of seaborne volume (around 200 kb/d to Bulgaria, the only country allowed to import seaborne volumes until the end of 2024). Of the 700 kb/d currently transiting the Druzhba pipeline, about 0.3–0.5 Mb/d can continue under exemptions to central/southeast European countries, such as Hungary, that argue they lack access to alternatives. Germany and Poland have agreed not to use the northern leg of the Druzhba pipeline, which runs through Belarus (avoiding Ukraine), for Russian crude despite the exemptions,²⁰ though they have sought to deliver Kazakh crude through Druzhba (potential transactions that Russia will probably find ways to prevent).²¹ From a 2021 average of 2.1m b/d of crude imports from Russia, going forward, Europe will now likely take in only around 300–400 kb/d of Russian crude – a dramatic drop.

The EU/G7's price cap on Russian crude, which is set at \$60/b, came into effect in early December 2022.²² The workability of the cap—akin to a Western-imposed OSP on Russian crude—is already being questioned, however. This is not surprising. Even prior to its introduction, the cap faced numerous obstacles: differences between the US and EU over where the cap should be set; how it will be policed given that over-the-counter trade transactions are “off the books”; the fact that it is not dynamic²³ (meaning it does not move automatically with the flat price or shifts in crude differentials and benchmark values, though it can be adjusted over time by further decisions²⁴); and which of a growing number of potential exemptions should be granted.

The spread between the price cap and the outright price of Urals in the market has also been influenced by a range of factors: set the cap too low and Russia will lack any incentive to participate, raising the risk of unilateral cuts; set the price too high and the cap becomes redundant, acting simply as a nondynamic OSP that fails to deprive the Kremlin of revenue while making oil supply chains less efficient and even reducing the current discounts that customers are demanding. The workability of the price cap is also indirectly influenced by OPEC+ policy. By protecting an implicit floor price, Saudi Arabia has made it difficult for the West to introduce a price cap far below that level, as such a move changes the “price cap band”: a price cap too far below OPEC+'s implied floor price of circa USD \$80/b²⁵ will increase the risk of unilateral cuts by Russia. It is also worth noting that Russian crude sales to Asia are on a delivered rather than a free on board (FOB) basis—a situation that the price cap pricing basis does not entirely capture, given that delivered pricing terms between buyer and seller remain opaque and difficult to capture (e.g., payment terms, pricing terms, and shipping costs).

Figure 8: Urals (FOB Primorsk and DAP India) and Dated Brent outright

Note: Platts assessments for Urals (DAP) West Coast India started on January 18, 2023.

Source: S&P Commodity Insights, accessed February 10, 2023.

For now, the disputes over the principle and practicalities of a cap mean that it appears watered down to the point of ineffectiveness. However, the mere existence of such a mechanism could be concerning for both Russia and OPEC+. It is too early to make a call on the effectiveness of the price cap; however, as pressures grow on Russia's supply chain, Russia will face a choice between "self-sanctioning" by cutting exports deliberately, as announced on February 10, 2023 (by 500 kb/d), avoiding the cap (at a higher cost and eventually with some unavoidable loss of exports), or accepting the principle. Though it would recoup part if not all of the cost of a voluntary export cut in higher prices—how much would depend critically on the response of its OPEC+ colleagues—if and when it accepted the principle of a price cap even tacitly, and if a cap that is set "too high" (i.e., at or above current discounted Russian prices) operates without major market disruption, the G7 would have the option to lower the cap and/or tighten enforcement.²⁶

Saudi Arabia would also be very wary of an effective price cap, which it fears might one day be turned against it or other OPEC+ members in a kind of "buyers' cartel," or even as a way to capture rents in a climate-conscious world with long-term shrinking oil demand.

Clearly, the Middle East's importance is growing in the current market. The gross quantity the Middle East produces and exports is crucial. But beyond that, decisions on target markets, pricing, and crude trade will be influential in determining how effective sanctions are and how much pain Europe and key Asian markets suffer in the process.

As Russia now gears to shift yet more of its crude east, there are six key strategic issues to watch for in the region:

1

The Middle East will initially be protected from Russian competition via term contracts with Asian refiners. As Russian volumes increasingly head to Asia (particularly India and China), the Middle East should find protection via its term contracts that were negotiated on either an annual or quarterly basis. Most flexibility to accommodate growing Russian barrels will come from either displacement of other spot barrels (e.g., West Africa and the US) or from higher refinery runs in Asia and the Middle East itself, particularly given that demand in Asia is expected to grow by 1.3–1.4 Mb/d year over year in 2023.²⁷

However, in the longer term, the Middle East will have to consider how far it is willing to be shunted out of the key Asian growth markets—on which companies such as Aramco have lavished major attention and capital spending on refining and petrochemical joint ventures—in favor of a shrinking market in Europe. This depends in part on how successfully Russia maintains production capacity over the next few years amid bans on oil field investment and technology.²⁸

2

Asia has now become an even bigger sink for sanctioned crudes, giving China and India significant pricing power. Both are able to extract sizeable discounts from Russia, partly explaining why Urals has been trading at attractive prices on a delivered basis. China in particular also has the ability to modulate between Russian, Iranian, and Venezuelan crude, the three main sanctioned streams.

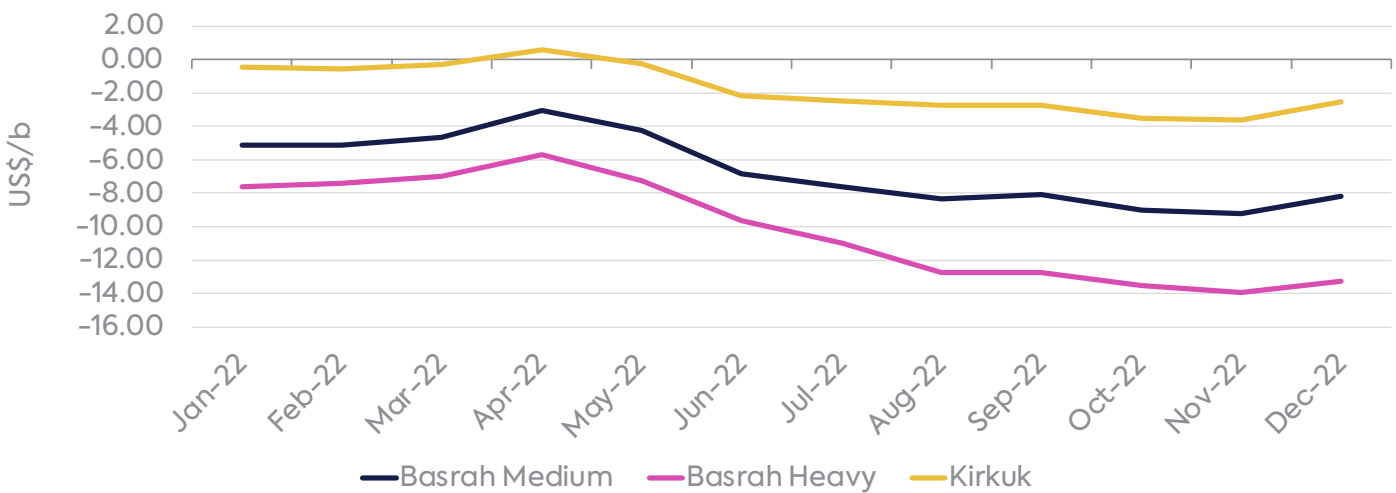
3

Not all Middle Eastern barrels are equal for Europe. Although the Middle East acts as a baseload for Asia, incremental volumes backed out of Asia will inevitably find a home in Europe, presenting both opportunities and challenges. Europe's ongoing diesel shortage has put the spotlight on its refining system, which, compared to demand patterns in the European market, is more heavily geared for gasoline than for gas oil/diesel. The massive spread between diesel and gasoline cracks²⁹ in Europe has meant that Middle Eastern crudes, which have a higher diesel yield, are more attractive than grades with a higher fuel oil yield. Prior to Russia's invasion of Ukraine, European refiners could make approximately \$17/b of diesel. Now that figure is around \$30/b, while margins for heavy fuel oil and naphtha (light petrochemical feedstock) are negative. This is particularly a problem for Europe, though not exclusively so, and it would be worsened by deeper cuts in production of diesel-rich Russian and/or Gulf crudes (due to further sanctions or OPEC+ quota reductions).

This operational reality is reflected in Saudi versus Iraq OSPs for Europe (see Figures 9 and 10), as OSPs for more diesel-rich Saudi crudes have risen since February, especially for the lighter grades, while Iraqi OSPs have fallen sharply. The premium for lower sulfur, distillate-

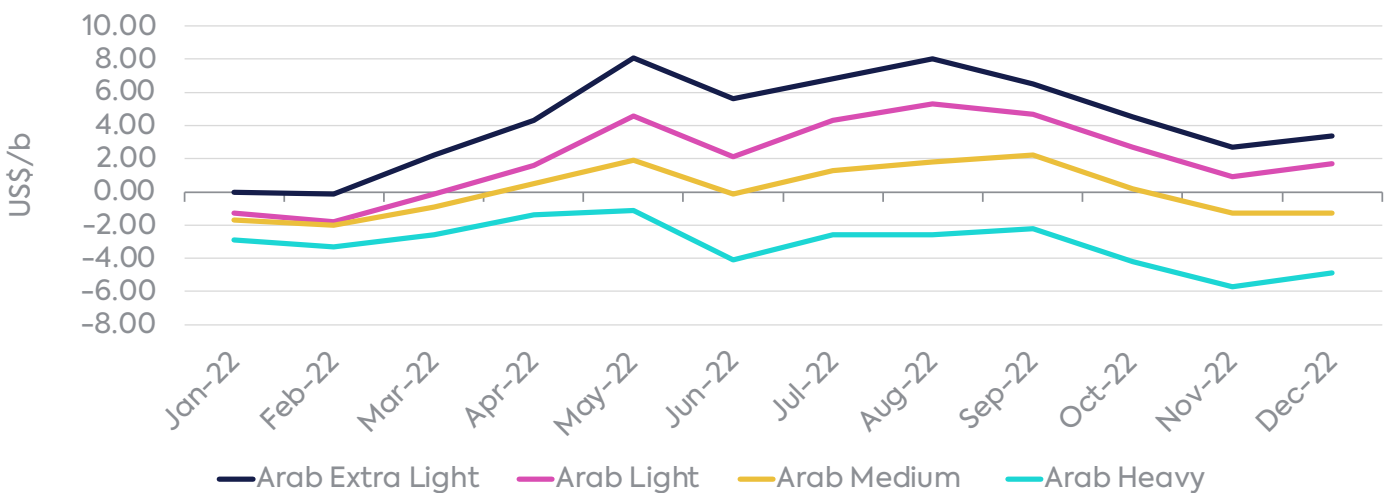
rich grades is also being reinforced by the high cost of desulfurization (due to high hydrogen costs, impacted by elevated natural gas prices and the cost of EU emissions permits). As a general rule of thumb, every \$10/metric million British thermal unit increase in the gas price translates to a \$1–\$1.5/b increase in the variable hydrocracker cost.³⁰ In all likelihood, grades such as Iraq’s Basrah Medium will be blended with lighter grades (e.g., the US’s West Texas Intermediate) to address any major crude quality imbalances building up in the European refining system, though this depends on the level of Iraq’s compliance with production cuts.

Figure 9: Iraq OSPs to Europe (vs. Dated Brent)



Source: Iraq State Oil Marketing Organization (SOMO) OSPs for 2022.

Figure 10: Saudi Aramco OSPs to NWE (vs. ICE Brent)



Source: Saudi Aramco OSPs for 2022.

In addition, with Urals no longer reflecting the economics of European refining, the Middle East has lost a key marker for pricing sour crude exports to Europe. For decades, Middle Eastern exporters looked at how Urals—the largest spot grade trading in the European market—priced against Dated Brent to assess how OSPs to Europe should be set. The disappearance of Urals has deprived Moscow of this privileged position in Middle East pricing to Europe, creating new puzzles for Middle Eastern marketing teams.

4

The Middle East could be a key beneficiary of the trade flow dislocation. A recent example of a cargo of Russian crude entering the UAE’s Ruwais refinery,³¹ which can refine up to 420 kb/d of heavier, sourer crudes instead of the more valuable Murban grade due to ADNOC’s crude flexibility project,³² provides a good example of the potential optimization by Middle Eastern NOCs in response to trade flow dislocations. Although G7 rules may eventually prevent Middle Eastern countries from reexporting Russia-derived products to Europe, they could direct these to their domestic market while exporting products refined from their own crude. Likewise, the influx of Russian fuel oil to the UAE’s Fujairah Oil Terminal has meant that Fujairah has become Russia’s new Rotterdam—a center for storage, blending, and reexport. It is expected that during the summer of 2023, when power generation peaks seasonally, Middle East producers (primarily Saudi Arabia, Iraq, and Kuwait) will benefit from the ample availability of discounted Russian fuel oil, freeing up room for valuable crude exports, particularly if H2 demand sees market balances tighten considerably in 2023 as expected.³³

5

The Middle East has the potential to play the role of balancer in chief in Europe. It is expected that as more Russian crude is redirected to Asia, Europe will find cover from key candidates such as West Africa and Norway, who will be displaced from Asia (particularly given the longer voyages and freight costs). Likewise, US production growth is expected to reach between 800 kb/d and 1 Mb/d in 2023.³⁴ Nevertheless, in scenarios where market tightness occurs and OPEC+ has control over the market, players such as Saudi Arabia, the UAE, and Iraq can serve as balancers, helping backfill Europe’s import requirements. This is particularly the case given the vulnerabilities of key exporters such as Libya³⁵ and Nigeria,³⁶ whose exports can be highly volatile, and Iran, where tight sanctions severely limit oil sales and repeated major antigovernment protests could at some point interrupt production.³⁷

6

This balancing act involves plugging not only crude trade imbalances but also geopolitical ones. As pressure on Russia’s oil supply chain intensifies in the coming months, the Middle East will be critical to Russia’s resilience (reinforcing the Middle East’s strategic importance). Most Russian trading houses have relocated to the UAE; Iran, despite facing pressure from Russian crude hitting its key market in China, has offered its tanker fleet to support Russian oil movements as well as military support

in Ukraine; and OPEC+, in which Russia is a key decision maker, is only set to grow in importance this year. So far, Riyadh and Moscow remain closely aligned. Saudi Arabia's market power has grown significantly as Saudi and Russian production profiles eventually diverge. However, some key risks remain for Saudi Arabia going forward: in a scenario where Russia decides to cut output unilaterally to avoid the price cap – as indeed it has just announced it will – the Kingdom may decide, also unilaterally or with the UAE, to offset this to avoid a price spike that would damage demand. However, with balances expected to tighten significantly in Q3 2023, Russia may seek to veto a move by players such as Saudi Arabia, the UAE, and Iraq to increase OPEC+ production targets, reigniting tensions between Saudi Arabia and the US or requiring Riyadh to break the OPEC+ framework.

For now, the Middle East crude exporters have gained overall from the Russia shock, mainly via higher prices. They have adapted to new competition, moderate loss of market share in India has been compensated for by higher sales to Europe, OSPs have shown increase, and Middle East players themselves can benefit from using, refining, and trading Russian oil. Iran is probably the exception because of the greater competition in its only remaining sizeable market, China, although it has managed to boost exports recently.

However, the more stringent measures on Russia have not yet shown their full effect. As the situation drags on, the Russian position in OPEC+ could become a burden by, for instance, preventing the organization from increasing output targets even as its own exports drop. Competition from Russian barrels in Asia complicates pricing for Asian term clients as discounted Russian crude puts pressure on spot valuations. Setting optimal OSPs to maximize pricing while defending market share has become trickier. All of this could very well give rise to Saudi-Russian tensions, or at least to Saudi Arabia's prized oil market flexibility being compromised by the need to accommodate Moscow. As Russia and Saudi production profiles diverge over time, OPEC+ power relations will likely shift, opening a potentially new chapter for the organization.

Notes

1. European Council, “EU Sanctions against Russian Explained,” January 18, 2023, <https://www.consilium.europa.eu/en/policies/sanctions/restrictive-measures-against-russia-over-ukraine/sanctions-against-russia-explained/>.
2. Urals is a blend of crude oils from many Russian fields. It is classified as a medium-gravity sour crude, with an American Petroleum Institute (API) gravity of 31.5° and sulfur content of 1.44 percent. S&P Global, “Specifications Guide Europe and Africa Crude Oil,” July 2022, https://www.spglobal.com/commodityinsights/plattscontent/_assets/_files/en/our-methodology/methodology-specifications/emea-crude-methodology.pdf.
3. Johan Sverdrup (28° API, 0.8 percent sulfur): Michael Carolan, “Johan Sverdrup Emerges as Potential Benchmark Saviour,” Argus Media, June 14, 2021, <https://www.argusmedia.com/en/news/2224380-johan-sverdrup-emerges-as-potential-benchmark-saviour>. Phase 2 of the field started production in mid-December, with plateau production expected to reach 720 kb/d.
4. 28° API, 3.67 percent sulfur; S&P Global, “Specifications Guide Europe and Africa Crude Oil,” July 2022, https://www.spglobal.com/commodityinsights/plattscontent/_assets/_files/en/our-methodology/methodology-specifications/emea-crude-methodology.pdf.
5. 33° API, 1.77 percent sulfur; S&P Global, “Specifications Guide Europe and Africa Crude Oil,” July 2022, https://www.spglobal.com/commodityinsights/plattscontent/_assets/_files/en/our-methodology/methodology-specifications/emea-crude-methodology.pdf.
6. OPEC, “Declaration of Cooperation,” 2022, https://www.opec.org/opec_web/en/publications/4580.htm.
7. Sam Meredith, “OPEC+ to Cut Oil Production by 2 Million Barrels per Day to Shore Up Prices, Defying U.S. Pressure,” CNBC, October 5, 2022, <https://www.cnbc.com/2022/10/05/oil-opec-imposes-deep-production-cuts-in-a-bid-to-shore-up-prices.html>.
8. “Iraq Restarts Kirkuk Crude Flows through KRG Pipeline,” Argus Media, November 16, 2018, <https://www.argusmedia.com/en/news/1794182-iraq-restarts-kirkuk-crude-flows-through-krp-pipeline>.
9. In February 2022, the Iraqi Federal Supreme Court ruled that the Kurdistan Regional Government’s (KRG) oil and gas law was unconstitutional, depriving it of the right to manage its upstream oil sector and sell oil independently. Although this ruling does not have an immediate practical effect, it may deter some European refiners from lifting KBT, which could put their existing crude purchase contracts with federal (non-KRG) Iraq at risk. See <https://>

www.gibsondunn.com/recent-iraqi-supreme-court-decision-likely-to-trigger-investment-arbitration-claims/.

10. Fareed Rahman, “Saudi Aramco Completes New Oil Deals with Poland’s PKN Orlen,” The National, November 30, 2022, <https://www.thenationalnews.com/business/energy/2022/11/30/saudi-aramco-completes-new-oil-deals-with-polands-pkn-orken/>.
11. Zhiyuan Li, “Saras Refinery Runs Lower 15% q/q, Likely to Miss Q3 Guidance,” Kpler, November 9, 2021, <https://www.kpler.com/blog/saras-refinery-runs-lower-15-q-q-likely-to-miss-q3-guidance>.
12. Reuters, “Italy Set to Nationalise Lukoil Refinery—Paper,” November 29, 2022, <https://www.reuters.com/business/energy/italy-set-nationalise-lukoil-refinery-paper-2022-11-29/>; Julia Payne and Giuseppe Fonte, “Russia’s Lukoil Reaches Deal to Sell Italian Refinery,” Reuters, January 9, 2023, <https://www.reuters.com/business/energy/trafigura-with-consortium-agrees-buy-lukoils-isab-refinery-sources-2023-01-09/>.
13. Ministry of Petroleum and Natural Gas, “Total 23 Refineries Working in the Country with Refining Capacity of 249.22 Million Metric Tons per Annum,” February 10, 2022, <https://pib.gov.in/PressReleaselframePage.aspx?PRID=1797261>.
14. Quotas in the latest round were increased to the highest level since the first round of 2021, but most of these go to five state-owned companies; only one private player, Zhejiang Rongsheng Petrochemical, receives export allowances. Shi Weijun, “Markets Await Chinese Product Export Quotas,” Petroleum Economist, October 24, 2022, <https://pemedianetwork.com/petroleum-economist/articles/trading-markets/2022/markets-await-chinese-product-export-quotas/>.
15. Bloomberg, “New Oil Traders Fill Void as Top Names Abandon Moscow Ties,” May 17, 2022, <https://www.bloomberg.com/news/articles/2022-05-17/new-oil-traders-fill-the-void-as-top-names-abandon-moscow-ties?sref=uK5WXUhK>.
16. Florence Tan, “Sinopec Plans to Extend Cuts in Saudi Crude Oil Imports to June, July: Officials,” Reuters, April 25, 2018, <https://www.reuters.com/article/us-china-oil-sinopec-corp/sinopec-plans-to-extend-cuts-in-saudi-crude-oil-imports-to-june-july-officials-idUSKBN1HW18Z>.
17. Florence Tan and Nidhi Verma, “UPDATE 3—Saudi to Supply Full June Crude Volumes to Most Buyers in Asia—Sources,” Reuters, May 11, 2021, <https://www.reuters.com/article/saudi-asia-oil-idAFL1N2MY07I>.
18. Market News, “ADNOC to Cut 5% of Crude Volumes to Term-Lifters for December,” November 28, 2022, <https://marketnews.com/adnoc-to-cut-5-of-crude-volumes-to-term-lifters-for-december>.

19. S&P Global, “Platts Dubai/Oman Benchmarks,” February 2021, https://www.spglobal.com/commodityinsights/plattscontent/_assets/_files/en/our-methodology/methodology-specifications/dubai_oman_benchmarks_faq.pdf.
20. Reuters, “Poland, Germany Seek EU Sanctions on Russian Druzhba Oil Pipeline,” November 27, 2022, <https://tribune.com.pk/story/2388425/poland-germany-seek-eu-sanctions-on-russian-druzhba-oil-pipeline>.
21. Julian Lee, “Germany’s Pivot to Piped Kazakh Oil Looks Like a Pipe Dream,” Bloomberg, December 21, 2022, <https://www.bloomberg.com/news/articles/2022-12-21/germany-s-pivot-to-piped-kazakh-oil-looks-like-a-pipe-dream>.
22. Edward Fishman, “How the Price Cap on Russian Oil Will Work in Practice,” Center on Global Energy Policy, November 30, 2022, <https://www.energypolicy.columbia.edu/publications/how-price-cap-russian-oil-will-work-practice/>.
23. Jan Cienski, “Watch Out for Next Winter, Energy Chief Warns Europe,” Politico, November 30, 2022, <https://www.politico.eu/article/fatih-birol-warning-energy-winter-europe/>.
24. Reuters, “Russian Oil Price Cap Can Be Adjusted to Market Developments—EU Head,” December 2, 2022, <https://www.reuters.com/business/energy/russian-oil-price-cap-can-be-adjusted-market-developments-eu-head-2022-12-02/>.
25. Or, indeed, the US’s implied floor for Strategic Petroleum Reserve refilling of \$70/b (for West Texas Intermediate, trading as of late January 2023 at about \$7/b below ICE Brent).
26. European Commission, “Questions and Answers: G7 Agrees Oil Price Cap to Reduce Russia’s Revenues, while Keeping Global Energy Markets Stable,” December 3, 2022, https://ec.europa.eu/commission/presscorner/detail/en/QANDA_22_7469.
27. Net global refining capacity will expand by 1.6 Mb/d in 2023, according to the International Energy Agency, including 140 kb/d at Karbala (Iraq), 230 kb/d at Duqm (Oman), and 135 kb/d at Visakha (India). Several large, new refineries in China should come online in 2024. Insights Global, “EIA: New Refineries Will Increase Global Refining Capacity in 2022 and 2023; China Leads,” July 28, 2022, <https://www.insights-global.com/eia-new-refineries-will-increase-global-refining-capacity-in-2022-and-2023-china-leads/>; International Energy Agency Oil Market Report, December 15, 2022, <https://www.iea.org/reports/oil-market-report-december-2022>.
28. For example, this study, concluded in 2019 before COVID-19 and the war, was already quite negative on Russia’s ability to maintain production levels beyond 2030: Nikita O. Kapustin and Dmitry A. Grushevenko, “A Long-Term Outlook on Russian Oil Industry Facing Internal and External Challenges,” *Oil & Gas Science and Technology Revue, IFP Energies Nouvelles*, 74, no.

- 72 (September 13, 2019), https://ogst.ifpenergiesnouvelles.fr/articles/ogst/full_html/2019/01/ogst190118/ogst190118.html.
29. The measure of the gross profit from refining one barrel of reference crude into one barrel of product.
30. The authors would like to thank Steve Sawyer, refining specialist at Facts Global Energy, for this point.
31. Julian Lee and Anthony Di Paola, “Russia Delivers First Crude Cargo to UAE’s Ruwais Refinery,” Bloomberg, November 14, 2022, <https://www.bloomberg.com/news/articles/2022-11-14/russia-delivers-first-crude-cargo-to-uae-s-ruwais-refinery>.
32. See <https://www.adnoc.ae/en/our-projects/crude-flexibility>.
33. International Energy Agency Oil Market Report, December 15, 2022, <https://www.iea.org/reports/oil-market-report-december-2022>.
34. Ibid.
35. Salma El Wardany and Verity Ratcliffe, “Libya’s Crude Oil Exports Drop Sharply after Key Ports Halt,” Bloomberg, July 1, 2022, <https://www.bloomberg.com/news/articles/2022-07-01/libya-s-crude-oil-exports-drop-sharply-after-key-ports-halt>.
36. Libby George, “Nigeria’s Oil Output at 32-Year Low as Thieves Hobble Output,” Reuters, September 9, 2022, <https://www.reuters.com/business/energy/nigerias-oil-output-drops-below-1-mln-bpd-2022-09-09/>.
37. Joshua Askew, “Iran Protests: What Caused Them? Are They Different This Time? Will the Regime Fall?” Euronews, December 20, 2022, <https://www.euronews.com/2022/11/25/iran-protests-what-caused-them-who-is-generation-z-will-the-unrest-lead-to-revolution>.

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