

# Thailand Refinery

## การคว่ำบาตรทางเศรษฐกิจของสหรัฐฯ กับอาวุธในด้านพลังงานของรัสเซีย

- เราเห็นผลกระทบสำคัญ 3 ประการจากมาตรการคว่ำบาตรรัสเซียต่อตลาดน้ำมัน: ราคาน้ำมันที่สูงขึ้น, ค่าการกลั่นที่สูงขึ้น, และอำนาจที่เพิ่มขึ้นของฝ่ายรัสเซียและจีน
- เราคาดว่าต้นทุนน้ำมันดิบที่สูงขึ้นน่าจะชดเชยได้ด้วยค่าการกลั่น (GRM) ที่สูงขึ้น USD3-6/bbl
- ESSO และ BCP เป็นหุ้นเด่นของเราในกลุ่มโรงกลั่น; PTTEP เป็นหุ้นเด่นในกลุ่มต้นน้ำ

### ผลกระทบของมาตรการคว่ำบาตรรัสเซียจะทำให้ราคาน้ำมันและ GRM ปรับขึ้นในปี 2022

เราเห็นผลกระทบสำคัญ 3 ประการจากมาตรการคว่ำบาตรรัสเซียต่อตลาดน้ำมัน – ราคาน้ำมันที่ปรับตัวสูงขึ้นเหนือ USD140/bbl เป็นระยะเวลานานขึ้นโดยจะเฉลี่ยอยู่ที่ USD100/bbl ในปี 2022, GRM ที่สูงขึ้นและอำนาจที่เพิ่มขึ้นของฝ่ายรัสเซียและจีนต่อกลุ่ม Anglo-Saxon ที่นำโดยสหรัฐฯ จะเปลี่ยนดุลยภาพของตลาดพลังงานโลก การวิเคราะห์ของเราจะระบุว่าความสัมพันธ์ระหว่างสหภาพยุโรปและรัสเซียในตลาดน้ำมันมีรากฐานมาจากการพึ่งพากันและกันที่ทั้งสองฝ่ายได้ประโยชน์มากกว่าการอิงอาศัยที่ฝ่ายหนึ่งได้ ในขณะที่อีกฝ่ายไม่เสียอะไร ในขณะที่สหรัฐฯ แคนาดา และสหราชอาณาจักรได้ประกาศมาตรการคว่ำบาตรหรือถอนตัวออกจากพลังงานของรัสเซีย สหภาพยุโรปกลับรีรอโดยออกกลยุทธ์พลังงานใหม่ที่เรียกว่า “REPowerEU” ซึ่งประกอบด้วยแผนที่จะลด 2 ใน 3 ของการนำเข้าก๊าซจากรัสเซียภายในสิ้นปี 2022 เพื่อให้เป็นอิสระจากเชื้อเพลิงฟอสซิลของรัสเซียเต็ม 100% ภายในปี 2030 ในที่สุด

### ความเสี่ยงในด้านอุปทานน้ำมันดิบและผลิตภัณฑ์น้ำมันจากรัสเซียสูงถึง 3mbpd และ 1mbpd ตามลำดับ

ถ้าการค้าน้ำมันระหว่างสหภาพยุโรปและรัสเซียถูกตัดโดยมาตรการคว่ำบาตรเต็ม 100% เราคาดว่าอุปทานน้ำมันดิบและผลิตภัณฑ์น้ำมันจากรัสเซียจำนวนประมาณ 3mbpd และ 1mbpd จะหายไปจากตลาด ซึ่งอาจสร้างความสั่นสะเทือนในด้านอุปทานน้ำมันจาก 1) ตลาดน้ำมันที่ตึงตัวพร้อมอุปทานที่ตึงจำกัดส่วนมากอยู่ในกลุ่ม OPEC+; 2) ความต้องการที่คาดว่าจะโตหลังการฟื้นตัวของเศรษฐกิจโลก; 3) การเปลี่ยนแปลงในด้านการเมืองจากการที่ซาอุดีอาระเบียและ UAE เข้าข้างรัสเซียน่าจะจำกัดการผลิตน้ำมัน แม้ว่าอุปทานน้ำมันจากรัสเซียจะลดลงอย่างรุนแรงจากมาตรการคว่ำบาตร; 4) กำลังการผลิตน้ำมันสำรองของ OPEC ที่อยู่ในระดับต่ำเพียง 4mbpd ในปัจจุบัน; 5) อิหร่านซึ่งปัจจุบันติดอยู่ในการเจรจานิวเคลียร์กับสหรัฐฯ ยังเป็นผู้ขายรายย่อยที่มีความไม่แน่นอนในการเพิ่มอุปทานน้ำมันอีก 1mbpd; และ 6) เวเนซุเอลาจะเพิ่มการผลิตน้ำมันถ้ามีการยกเลิกมาตรการคว่ำบาตรการขายน้ำมันเท่านั้น

### ผลกระทบต่อราคาน้ำมันดิบและ Premium จากความเสี่ยงในด้านอุปทานน้ำมันของรัสเซีย

เนื่องจากการส่งออกน้ำมันดิบของรัสเซียลดลงอย่างกระทันหันจากมาตรการคว่ำบาตร ราคาของน้ำมันดิบในตลาดโลกได้เพิ่มแบบก้าวกระโดด นอกจากนี้ Crude Premium ยังปรับตัวขึ้นในขณะที่โรงกลั่นโดยเฉพาะอย่างยิ่งในยุโรปมองหา น้ำมันดิบจากแหล่งอื่น ซึ่งมีผลให้ Refinery Supply ลดลง เราคาดว่าต้นทุนน้ำมันดิบจะเพิ่มขึ้น USD0.7/bbl สำหรับ ESSO (ใช้น้ำมันดิบจากตะวันออกกลาง 37%) และ USD2/bbl สำหรับ SPRC (ใช้น้ำมันดิบจากตะวันออกกลาง 91%) ซึ่งน่าจะชดเชยได้จาก GRM ที่ปรับขึ้น USD3-6/bbl จากอัตราค่าโรงแษงผลิตภัณฑ์น้ำมันที่คาดว่าจะสูงขึ้น USD10-20/bbl เมื่อเทียบกับราคาน้ำมันดิบ

### ชอบหุ้นโรงกลั่นโดยมี ESSO, BCP, และ PTTEP เป็นหุ้นเด่น

เราชอบกลุ่มโรงกลั่นปลายน้ำมากกว่าน้ำมันและก๊าซต้นน้ำ เนื่องจากเราคาดว่าอุปสงค์น้ำมันและผลิตภัณฑ์น้ำมันจะโตเร็วกว่าอุปทาน เราปรับเพิ่มสมมติฐานราคาน้ำมันดิบไปปี 2022-24 เป็น USD100/90/90 ต่อบาร์เรลและปรับ GRM ของสิงคโปร์ขึ้นอีก 11-17% เพื่อรวมประมาณการอัตราค่าโรงแษงผลิตภัณฑ์น้ำมันที่สูงขึ้นจากอุปทานที่ตึงตัวมากขึ้นและการเติบโตของความต้องการที่สูงขึ้น ESSO และ BCP เป็นหุ้นเด่นจาก Upsides ในด้านกำไรจากสถานีบริการน้ำมัน PTTEP เป็นหุ้นเด่นในกลุ่มต้นน้ำจากกำไรที่มีศักยภาพในการเติบโตสูง



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## US economic sanctions vs Russia's energy weapon

Russia's invasion of Ukraine and the ensuing sanctions by the US and EU in the past month has stirred up global supply risks for many commodities, from soft commodities (wheat, soybean, corn) to metals (nickel, lithium, aluminium) and energy (oil, gas, and coal). While the prices of gas and coal have jumped by over 2x and are now starting to normalise, the price of crude oil has shot up at a more gradual pace as the EU continues to buy oil from Russia.

### Russia-EU symbiosis: energy mutualism or commensalism?

Amid Russia's invasion of Ukraine, the EU and US have now come close to deciding the final judgement day for Russia in terms of sanctions this week during the special meeting of the North Atlantic Treaty Organization (NATO), underlining the efforts by the US-EU allies to enforce the avalanche of existing sanctions on Russia.

But apart from a few Western countries which have already stopped buying or plan to stop buying crude oil from Russia, the rest of the world is still divided over an oil trade embargo with Russia, given their complex energy requirements.

Over the years, Russia has strengthened its energy ties with EU countries, with countries such as Finland and Poland getting over 50% of their crude oil imports from Russia. Germany and the Netherlands are also two countries with high dependency on Russia's oil supplies, and hence have recently warned against hasty decisions as sanctions could raise energy prices further and leave some refineries idle.

While an outright ban on Russian oil imports by the EU could affect around 27% of the EU's oil imports, the more serious question would be how several landlocked refineries, mostly co-owned by Russian firms, and almost being completely dependent on Russian crude supplies via pipelines, could manage the oil supply shock within just a short period.

### Exhibit 1: Major companies which stopped buying oil from Russia

Refinery	Country	
 BP	UK	The British oil major, which is abandoning its stake in Rosneft, will not enter new deals with Russian entities unless "essential for ensuring security of supplies"
 ENI	Italy	The energy group, 30.3% owned by the Italian government, is suspending purchases of Russian oil.
 Equinor	Norway	Norway's majority state-owned energy firm has stopped trading Russian oil as it winds down its operations in the country.
 Galp	Portugal	The Portuguese oil and gas company has suspended all new purchases of petroleum products from Russia.
 Neste	Finland	The Finnish refiner has Russian oil contracts until the end of the year, but is not making any new supply agreements.
 Preem	Sweden	Sweden's largest refiner, owned by Saudi billionaire Mohammed Hussein al-Amoudi, has "paused" new orders of Russian crude.
 Repsol	Spain	The Spanish company has stopped buying Russian crude oil in the spot market.
 Shell	UK	The world's largest petroleum trader will stop buying Russian crude and phase out its involvement in all Russian hydrocarbons.
 TotalEnergies	France	The French company has stopped buying oil from Russia, although one of its land-locked refineries in Germany continues to receive Russian crude by pipeline.
 Varo Energy	Switzerland	The Swiss refiner, which owns 51.4% in Germany's Bayernoil refinery, said it did not plan to enter into new deals to buy Russian crude.

Source: [Times of India](#)

### Exhibit 2: Major companies which are still buying oil from Russia

Refinery	Country	
 Neftohim Bargas	Bulgaria	Bulgarian refinery, owned by Russia's Lukoil, continues to refine Russian crude.
 Miro	Germany	Russian crude continues to account for about 14% of the intake at Germany's largest refinery, Miro.
 PCK Schwedt	Germany	Germany's refinery, 54% owned by Rosneft, receives crude oil via the Druzhba pipeline.
 Leuna	Germany	The land-locked Leuna refinery in eastern Germany, majority-owned by TotalEnergies, is also fed Russian crude.
 Hellenic Petroleum	Greece	Greece's biggest oil refiner is relying on Russian crude for about 15% of its intake.
 ISAB	Italy	Italy's largest refinery, owned by Lukoil-controlled Swiss-based Litasco SA, processes Russian and non-Russian crudes.
 MOL	Hungary	The Hungarian oil group, continues to be supplied by the Druzhba pipeline. Hungary is opposed to sanctions on Russian oil and gas.
 PKN Orlen	Poland	Poland's largest refiner, which continues to buy Russian crude, said it was preparing for a complete halt.
 Zeeland Refinery	Netherlands	The Dutch refinery, 45%-owned by Lukoil, declined to comment on whether it was using Russian crude oil.
 Rotterdam refinery	Netherlands	Exxon Mobil declined to comment on whether its Dutch refinery in Rotterdam was using Russian crude oil.
 Hindustan Petroleum	India	India's state refiner bought 2 million barrels of Russian Urals for May loading.
 Indian Oil	India	India's top refiner has bought 3 million barrels of Urals for May delivery.

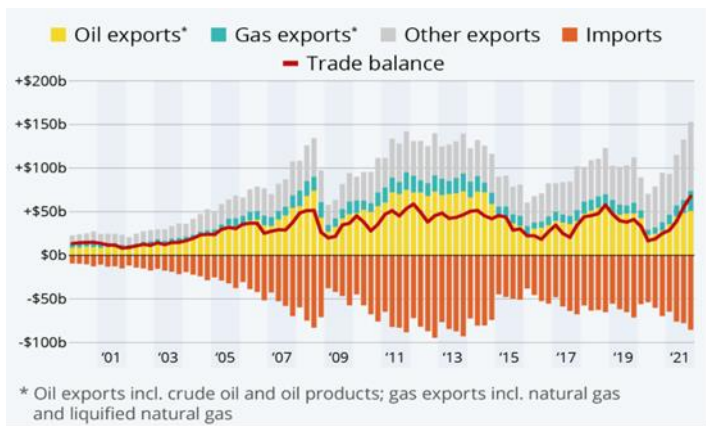
Source: [Times of India](#)

**Mutualistic relationship between Russia and the EU.** We see three key implications from the sanctions against Russia on the oil market – higher and longer oil prices above USD140/bbl, averaging USD100/bbl in 2022, surging market GRMs due to the tighter supply and higher demand, and the rising power of the Russia-China faction against the Anglo-Saxon group led by the US to shift the balance of the global energy markets.

We find that the EU-Russia relationship in the oil market has been rooted in “mutualism”, where both parties benefit, rather than “commensalism”, when one party benefits and the other is unaffected.

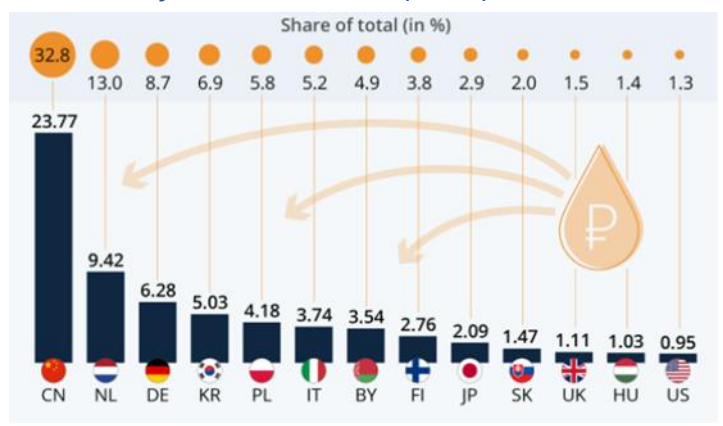
While the US, Canada, and the UK have announced embargoes or phase-out measures for Russian energy, the EU has instead held back, launching a new energy strategy called “REPowerEU”, a plan to reduce over two-thirds of the EU’s gas imports from Russia by end-2022 and eventually become independent from all Russian fossil fuels by 2030.

**Exhibit 3: Russia’s international trade in goods**



Source: [STATISTA](#)

**Exhibit 4: Trade value of crude oil exports from Russia, breakdown by destination in 2020 (USD b)**



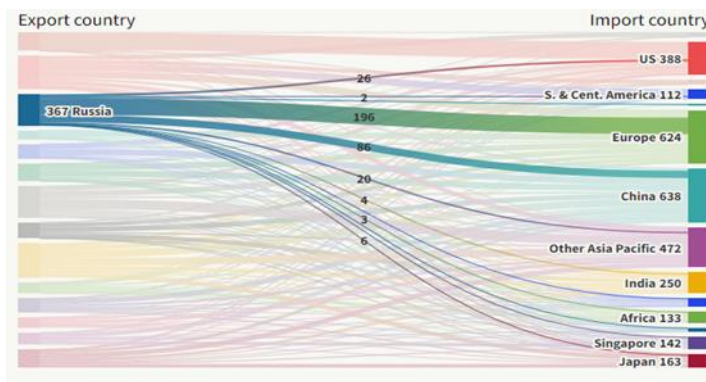
Source: [STATISTA](#)

If forced, we believe the EU could manage to have sufficient gas for the next winter without Russian gas, mostly via LNG imports from the US. Please see more details in our report, “Could Sino-Russo ties turn the sanctions tide?”, dated 9 Mar-22.

However, we think the EU may not be able to sustain the supply interruptions of oil and coal from Russia over the long term. A number of energy companies have already stopped or phased out their purchases of Russian oil and coal for fear of being caught out by further sanctions.

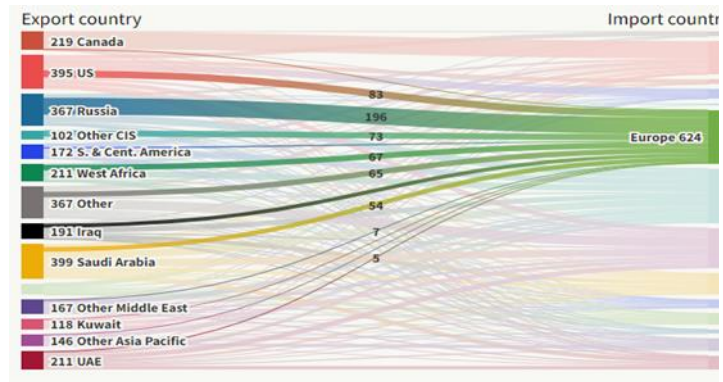
According to the US Energy Information Administration (EIA), on 24 Mar-22, the Russian Urals benchmark crude is trading at a substantial discount of 24% to the Brent crude oil price, and Russian refined oil products may not find their way to markets beginning in April 2022, as sanctions bite and buyers hold off.

**Exhibit 5: Russia’s oil export breakdown (mt)**



Source: [Bruegel](#)

**Exhibit 6: EU’s oil import breakdown (mt)**



Source: [Bruegel](#)

### Russian oil: the world's largest oil exporter at 8%

Russia was the world's largest oil exporter at 8% of the global supply in 2021, and the EU is the world's second largest oil importer, and the largest buyer of Russian oil, according to the EIA.

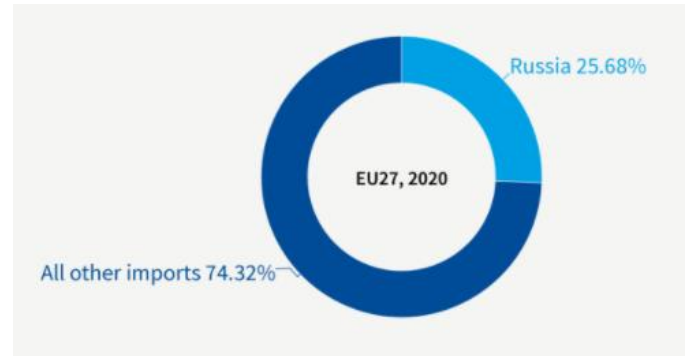
**Russian oil and product exports.** In Dec-21, Russia exported 5mbpd of crude oil and 2.8mbpd of oil products, including 1.1mbpd of gasoil/diesel, 0.6mbpd of fuel oil, and 0.5mbpd of naphtha. In 2020, total crude exports to the EU were 2.8mbpd, with 0.7mbpd arriving via pipeline and 2.1mbpd going through the sea. Oil exports to Asia were 2.1mbpd, with 0.8mbpd sent directly to China via pipeline. 70% of Russian oil products were exported to the EU and US markets in 2020, according to the EIA.

Exhibit 7: Europe's biggest importers of Russian oil (USD b)



Source: [Transport Environment](#)

Exhibit 8: Russia supplies one-quarter of the EU's crude oil imports

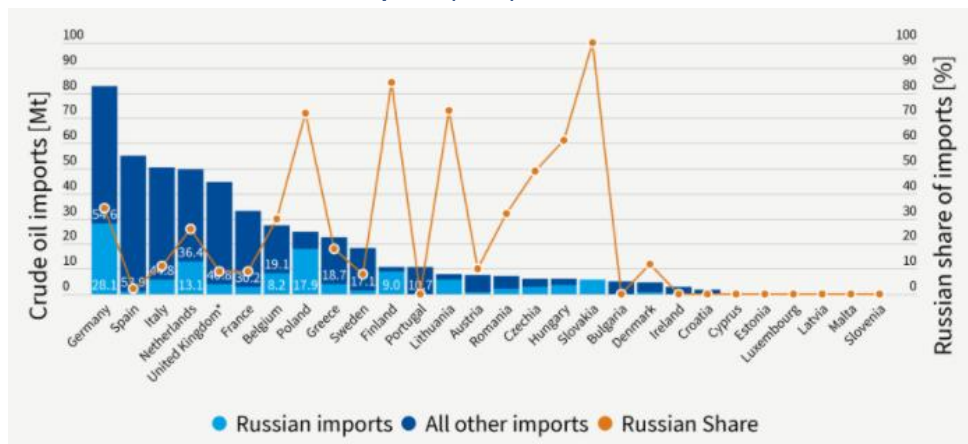


Source: [Transport Environment](#)

**37% of Russia's revenue came from oil exports in 2021.** In 2021, crude oil and petroleum product exports represented 37% of Russia's export revenue, according to the Federal Customs Service of Russia, when the oil price was at USD71/bbl. In Feb-22, the price of Russian oil averaged USD92/bbl.

Within the EU, Germany imported the largest amount of crude oil from Russia, followed by Poland. But in terms of the percentage oil imported, 80% of Poland's total oil imports came from Russia, putting Poland and Germany at the greatest risk in terms of oil supply if Russian oil is disrupted under full sanctions.

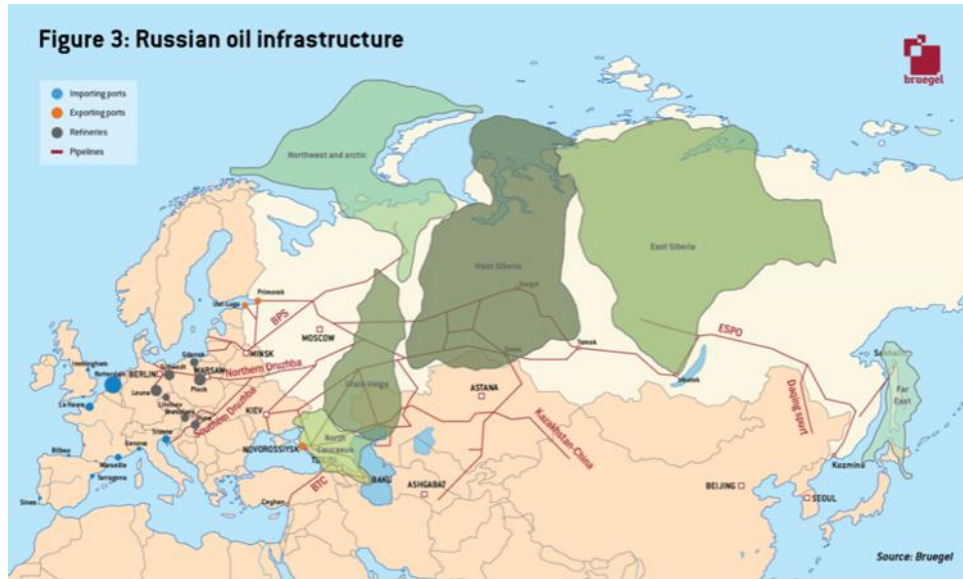
Exhibit 9: EU and UK's crude imports (2020)



Source: [Transport Environment](#)

**Russian oil infrastructure.** Russian oil infrastructure was built to serve eastern European markets, namely via the Druzhba oil pipeline which directly serves six refineries in the EU. However, since 2009, Russia developed export routes to Asian markets and directly to China via the ESPO-1 pipeline.

**Exhibit 10: Russian oil infrastructure**

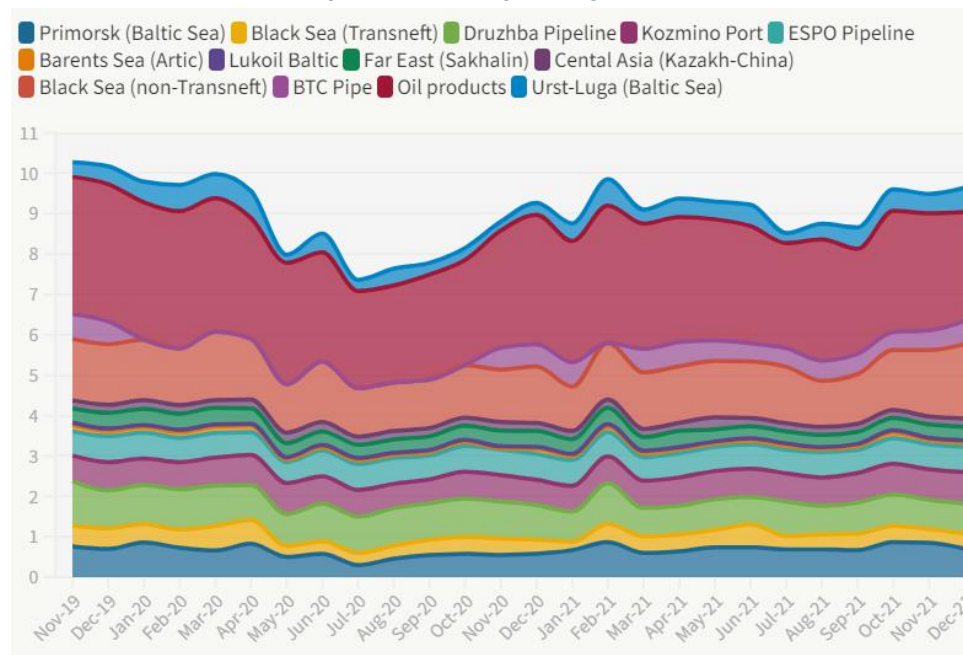


Source: [Bruegel](#)

**Up to 4mbpd of Russian oil is vulnerable to sanctions.** Based on the crude oil routes outlined in the OPEC Monthly Oil Market Report for the Commonwealth of Independent States (CIS), which includes Russia and Central Asian countries that were parts of the Soviet Union, we estimate that up to 4mbpd of Russian oil is vulnerable to sanctions by the EU and other non-EU countries.

The oil supply also includes Kazakhstan, which is interlinked into Russian export routes. An additional 1.5mbpd of oil products flowing to non-EU countries in the Organization for Economic Co-operation and Development (OECD) are also at risk.

**Exhibit 11: CIS oil exports by route (monthly average, mbpd)**

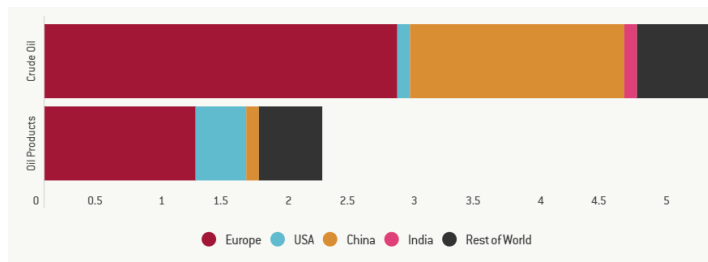


Sources: OPEC Monthly Oil Market Report; [Bruegel](#)

According to the EIA, while thus far Russia still continues to sell oil via its pipelines, Russia has struggled to find buyers for its seaborne oil shipments, with buyers shunning around 1.6mbpd of crude oil and 1mbpd of oil products. The EIA projects that the total volume of oil and related products being boycotted could rise to 3mbpd in Apr-22.

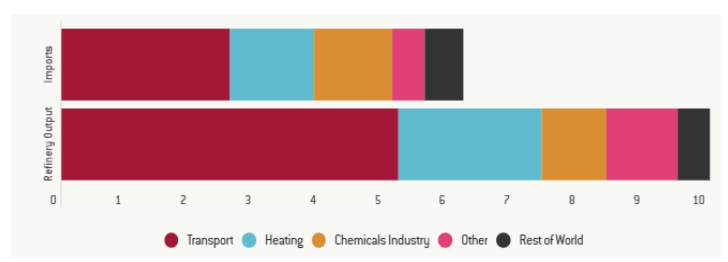
Europe remains Russia's largest oil market for both crude oil and refined oil products, with 2.8mbpd of crude oil and 1.3mbpd of refined oil products imported in 2020 from Russia. China was the second largest buyer of Russia's crude oil but accounted for a tiny portion of Russia's oil product exports. Hence, we think China may help offset the reduction in crude oil sales volume from Russia to the EU, but not for oil products.

Exhibit 12: Russia's oil exports in 2020 (mbpd)



Source: [Bruegel](#)

Exhibit 13: EU's oil products by demand in 2020 (mbpd)



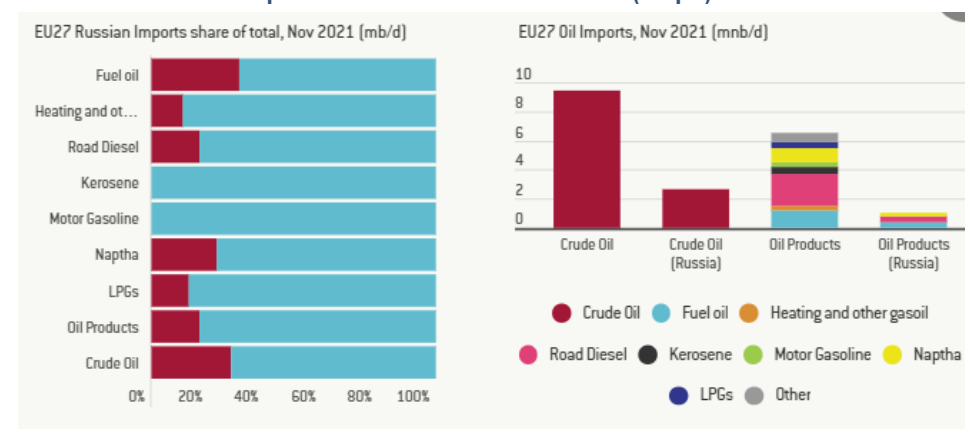
Source: [Bruegel](#)

**Netherlands, Germany, and Poland are top three countries relying on Russian oil exports.** The OECD Europe market accounts for 49% of Russian oil exports, 74% for gas, and 32% for coal, making OECD EU countries Russia's largest buyers of energy, according to the EIA. Within the OECD EU market, the Netherlands was the largest buyer of crude oil and condensate from Russia, followed by Germany and Poland.

**Diesel, naphtha, and fuel oil are the three most vulnerable products to Russia's supply disruptions to the EU.** However, in Nov-21, Russia's share of crude oil and oil products exported to the EU dropped significantly, even before the Russia-Ukraine war began in Feb-22, lowering to only 29% of the EU's total crude oil imports and merely 16% of oil product imports.

However, in terms of products, the EU is most vulnerable to the supply disruptions of diesel, naphtha, and fuel oil, which accounted for around one-quarter of the EU's total imports in Nov-21. In 2021, the EU imported a total of 15mbpd of crude oil and related products, of which 3.5mbpd came from Russia, worth €88b in revenue to Russia from the EU.

Exhibit 14: EU's oil imports and demand as of Nov-21 (mbpd)



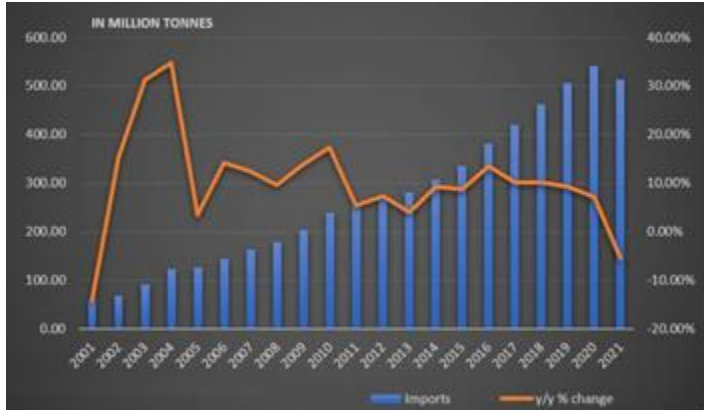
Source: [Bruegel](#)

### Russian oil: will China and India be Russia's white knights?

China and India, two of the world's largest crude consumers, could play significant roles in rescuing Russia's oil sales volumes from sharp drops, with the countries likely to buy 1.6-2.0mbpd of Russia's total 5.3mbpd volume in 2022, based on our estimate.

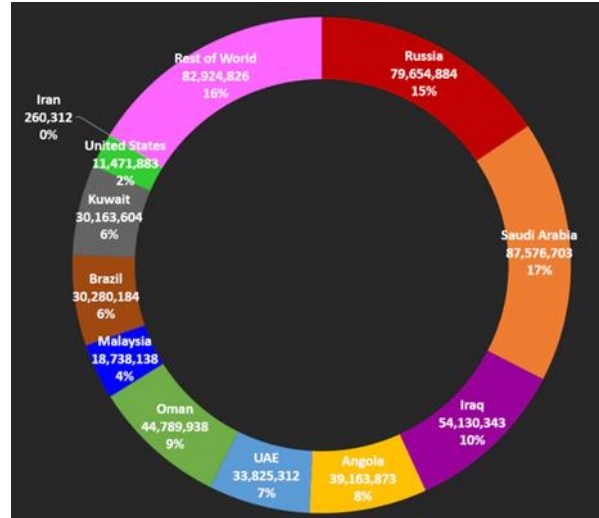
**China is Russia's largest oil buyer, while the US is only a marginal buyer.** On a country basis, China is Russia's largest energy buyer with 1.4mbpd of crude oil and condensate imports in 2021, according to the EIA. The US bought only 0.2mbpd of crude oil and condensate from Russia in 2021, down from 0.6mbpd in 2020.

Exhibit 15: China crude imports



Source: Reuters

Exhibit 16: China crude oil imports by origin in 2021



Source: Reuters

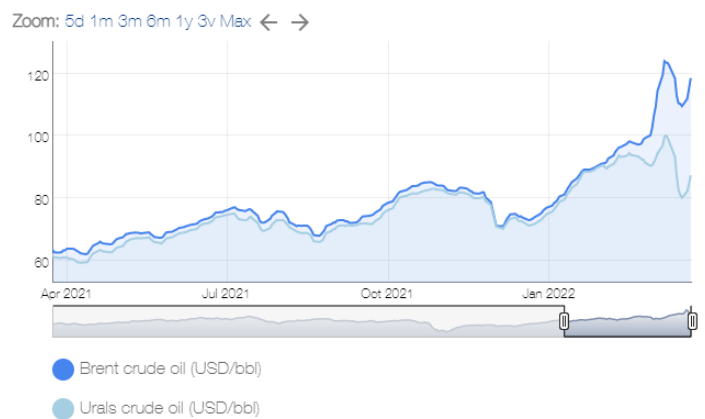
**India's rupee is a friend to Russia's ruble.** Historically, only European countries have heavily relied on Russian oil supplies. India, the world's third largest consumer of crude oil, has relied only marginally on Russian crude despite 80% of its crude consumption being imported.

Exhibit 17: Urals-Brent crude oil price differential



Source: Neste

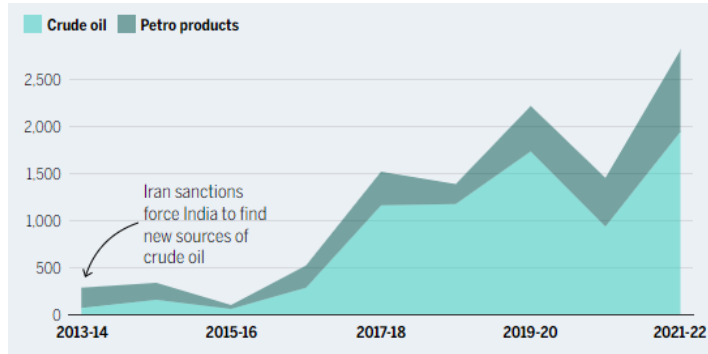
Exhibit 18: Brent and Urals crude oil prices



Source: Neste

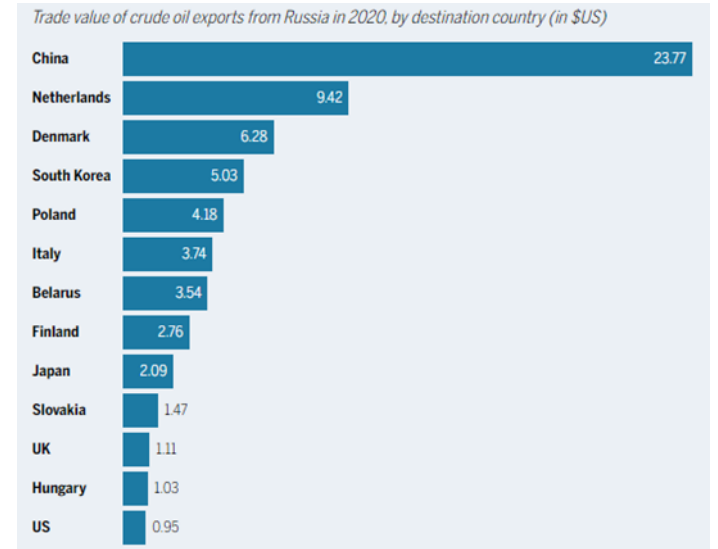
However, since Russia's invasion of Ukraine, India's oil imports from Russia have increased marginally, as Russia is offering its crude at heavy discounts to any willing buyers worldwide. Indian Oil Corporation (IOC IN) recently bought 3m bbls of Russian crude through traders, while Hindustan Petroleum Corporation Ltd (HPCL IN) has picked up 2m bbls of crude from Russia.

**Exhibit 19: India's imports of crude oil and products from Russia have jumped markedly since the start of the Russia-Ukraine war**



Source: [Times of India](#)

**Exhibit 20: Russia's biggest oil customer: China**

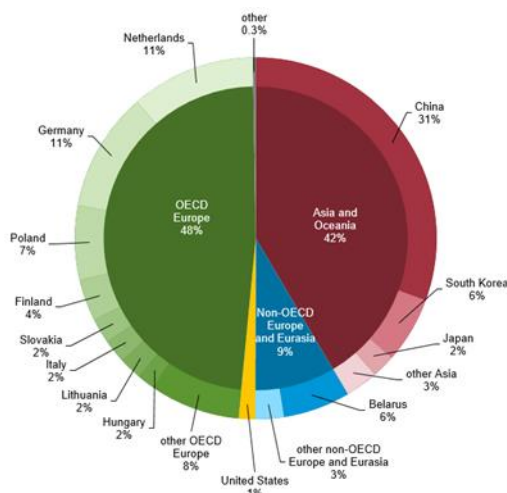


Source: [Times of India](#)

As of Mar-22, India's crude imports from Russia stood at 360kbpd, and the current shipment schedule suggests that at least over 0.2mbpd of crude imported from Russia will continue in Apr-22.

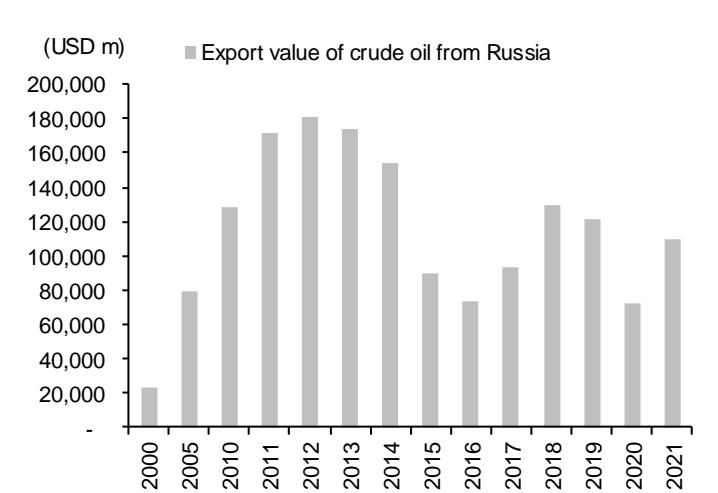
Not only has India ignored the warning from the US and EU, but it has also signalled that it plans to increase crude imports from Russia at deep discount prices. India's neutral stance among the four members of the Quad (the US, India, Australia, and Japan) and its ongoing crude imports from Russia have prompted the US to question India's stance, given that India has not imposed any sanctions on Russia or even condemned Russia for its invasion of Ukraine.

**Exhibit 21: Russia's crude oil and condensate exports by destination in 2020**



Source: [EIA](#)

**Exhibit 22: Export value of crude oil from Russia**



Source: [STATISTA](#)

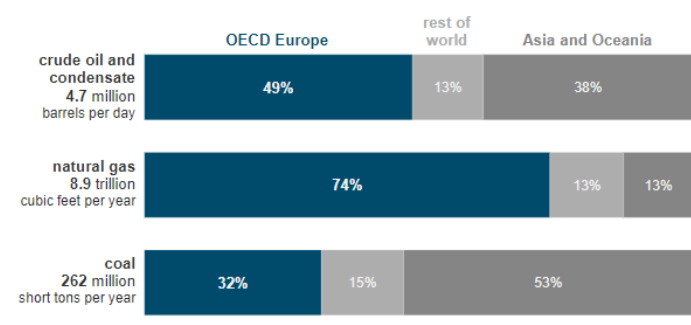


### Up to 3mbpd crude oil and 1mbpd oil product supply risk from Russia

If EU-Russian oil trade is cut via full sanctions, we estimate that around 3mbpd of Russian crude supply and 1mbpd of oil products would be taken off the market. This could create an oil supply shock given:

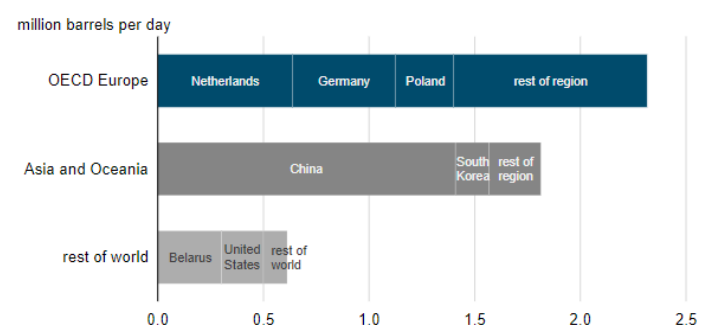
- 1) The already tight oil markets with limited supply growth are mostly in OPEC+;
- 2) The strong demand growth anticipated after the global economic recovery from the 2-year Covid-19 pandemic;
- 3) The changes in the political landscape with Saudi Arabia and the United Arab Emirates (UAE) now siding with Russia to likely limit their oil production volumes, despite the sharp drop in Russian oil supplies due to sanctions.
- 4) OPEC currently has a low spare oil production capacity of only 4mbpd, including 1-2mbpd from Saudi Arabia, 0.75mbpd from the UAE, and 0.5mbpd from Iraq. OPEC+, including OPEC, Russia, and Central Asian oil producers like Kazakhstan, has continued to constrain supply growth to only the group’s previously agreed-upon 0.4mbpd increase on a monthly basis;
- 5) Iran, currently locked in nuclear talks with the US, remains an uncertain marginal supplier which could increase the oil supply, even with its 1mbpd of spare oil capacity. Since 2018, Iran, under sanctions by the US, has produced a low oil volume, and the EIA estimates that Iran could ramp up its oil production by 0.5mbpd immediately, with the remaining 0.5mbpd of production requiring more time to ramp up;
- 6) Venezuela, which was requested by the US president to boost its oil production, has clearly shown its will to increase its oil production level, though only if full sanctions against its oil trading are lifted, implying that the US-EU sanctions against Russia may come at the cost of removing sanctions elsewhere (for Venezuela).

**Exhibit 23: Energy exports from Russia (2021)**



Source: [EIA](#)

**Exhibit 24: Crude oil and condensate exports from Russia (2021)**



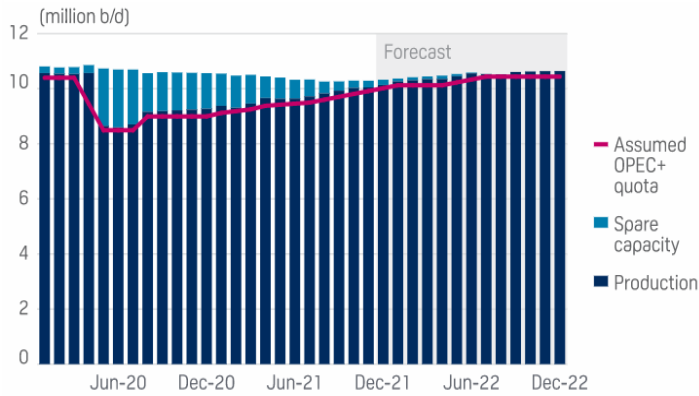
Source: [EIA](#)

As Russia had produced crude oil close to its full capacity of around 10mbpd as of the end of 2021, based on S&P Global’s forecast, we think there will be two implications for the global oil price and market in 2022.

First, Russia, as one of the world’s top three largest oil producers, now has a limited capacity to increase the oil supply, hence any oil supply disruptions from Russia would further exacerbate the already tight oil market and likely drive up the oil price.

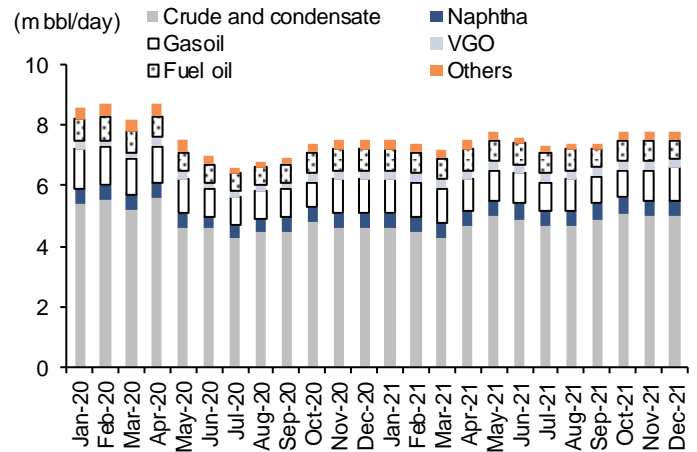
Second, as one of the key OPEC+ members, Russia is highly likely to pressure other members in OPEC+, particularly Saudi Arabia, the UAE, and Kazakhstan, to maintain the group’s 0.4mbpd oil production increase until the end of 2022, aiming to deploy the high oil price as a weapon to fight against the US-EU sanctions. The high oil price has already started to impact industrial and economic production costs in the EU and could later escalate global inflation higher.

**Exhibit 25: Russian crude production forecast**



Source: [S&P Global](#)

**Exhibit 26: Russian crude and oil product exports**



Source: [International Energy Agency \(IEA\)](#)

**Storm damage further tightens global oil supply.** On 23 Mar-22, a storm hit the Caspian Pipeline Consortium (CPC)'s pipeline from central Asia to the Black Sea, potentially cutting up to 1.0mbpd of crude oil for up to two months while repairs are made to storm-damaged loading facilities, according to Russia's Deputy Energy Ministry.

Kazakhstan produces oil and gas from three major fields – two onshore fields, Tengiz (0.9mbpd) and Karachaganak (0.4mbpd), and one offshore field, Kashagan (0.6mbpd), all being operated by US-based companies, according to the Journal of Petroleum Technology.

Kazakhstan exports light, sweet crude oil (CPC Blend) with an American Petroleum Index (API) of 45.3 and low sulphur of 0.56%, mostly through the CPC pipeline via the Caspian Sea to European markets, with significant volume transit to Italy and the Netherlands and a small volume to China, according to the EIA.

**Exhibit 27: Kazakhstan's major oil and gas fields**

Field name	Companies	Start year	Liquids production	Natural gas production
Tengiz (& Korolev)	Chevron, ExxonMobil, KazMunaiGaz, and Lukoil	1991	586,000 b/d petroleum and other liquids production in 2017 Expansion project to add 260,000 b/d of crude production beginning in 2022	272 Bcf dry marketed gas production in 2017
Karachaganak	BG, Eni, Chevron, Lukoil, KazMunaiGaz	1984	247,000 b/d total liquids production in 2017 An expansion project is under consideration, but potential production volumes are uncertain	About 300 Bcf wet marketed gas production in 2017
Kashagan	KazMunaiGaz, Eni, ExxonMobil, Shell, Total, China National Petroleum Corporation, Inpex	2016	370,000 b/d liquids processing capacity with current development	More than 100 Bcf natural gas production capacity

Source: EIA

CPC's pipeline runs 1,500km from the massive Tengiz oil field in western Kazakhstan to the port of Novorossiysk on Russia's Black Sea coastline, including oil produced by US super majors Chevron and ExxonMobil. The total CPC pipeline capacity is 1.4mbpd or about 2.5% of global seaborne oil trade and around two-thirds of Kazakhstan's oil exports.

The Russian state is CPC's largest shareholder with a 24% stake, while Chevron and ExxonMobil each own 15% and 7% stakes, respectively. Hence, Russia-Kazakhstan have control over CPC and the resumption of operations at the CPC pipeline by May-22 remains a key risk to the global oil supply, in our view.

### Exhibit 28: Export routes for Kazakhstan's major oil fields of Karachaganak and Tengiz via the storm-hit CPC pipeline transporting oil to the Russian pipeline system



Source: EIA

The oil supply interruption comes on the eve of US president Joe Biden's trip to Europe to discuss additional sanctions on Russia's oil sector in response to Russia's invasion of Ukraine. The Brent oil price spiked to over USD120/bbl.

While CPC officials indicated that the repairs require around two months, we think it could take longer based on the weather conditions, plus there is the possibility that repair parts imported from Western countries may not be available due to the sanctions. In addition, as the oil transported via CPC requires interlinkages with the Russian oil pipeline system, Russia may make it more difficult for repairs to be completed given Russia's current challenge to sell its oil.

### Exhibit 29: Kazakhstan's major oil pipeline

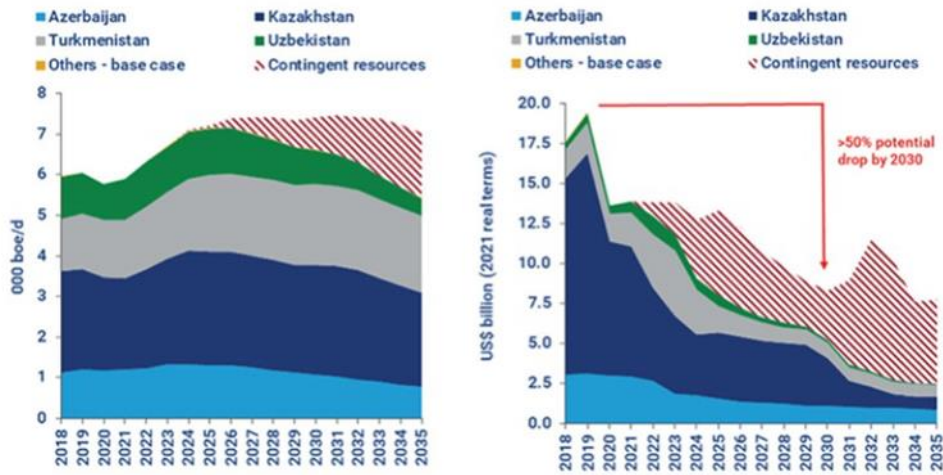


Source: EIA

**Kazakhstan**, a former part of the Soviet Union and currently a close ally with Russia, has the world's second largest oil reserves (7-13b bbls estimated by the EIA as of 2021) and the second largest oil production after Russia among the former Soviet Republics. As of Nov-21, Kazakhstan produced 1.9mbpd of oil production, up from 1.7mbpd in 2021, and is one of the key members in OPEC+ along with Russia as two non-OPEC members, according to the EIA.

Azerbaijan's Baku-Tbilisi-Ceyhan (BTC) export pipeline to Turkey and Kazakhstan's CPC to Russia's oil export terminal at Novorossiysk are key routes that landlocked Central Asia has devised as a way to get its crude oil to the market.

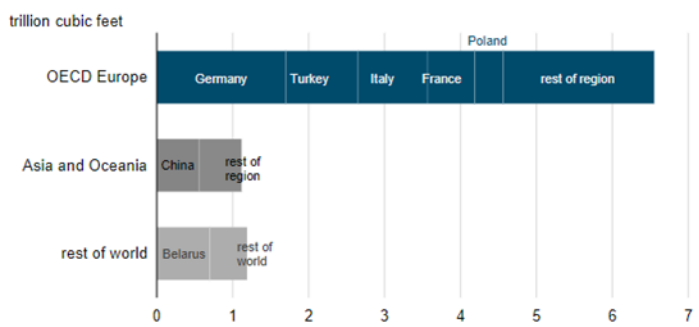
Exhibit 30: Oil production forecasts by Central Asian oil producers



Source: EIA

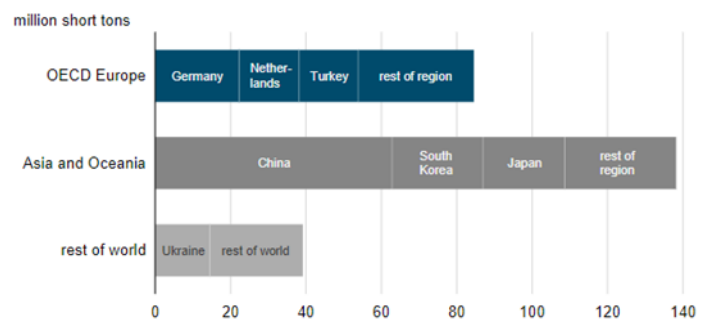
In addition to the greater impact on the oil price, we think the sanctions on Russia's energy supplies would also heighten the prices of gas and coal as Russia is one of the world's largest exporters of oil, gas, and coal, according to the EIA.

Exhibit 31: Natural gas exports from Russia (2021)



Source: EIA

Exhibit 32: Coal exports from Russia (2021)



Source: EIA

## Can any white knight fill up Russia's oil supply gap?

After the oil price collapsed and demand suddenly dropped during the pandemic in 2020-21, the global oil supply had continued to remain tight with limited new oil capacity coming on stream since 2017, according to the EIA. Then, beginning in 2H21, the global oil demand rose at a faster pace than expected, and is projected to grow by over 3mbpd y-y to 101mbpd in 2022. Under this industry landscape, we think it is less likely that any oil producers could replace Russia's oil supply of over 3mbpd if the full sanctions against Russia are implemented by the US-EU allies. We believe there are a few major oil suppliers that could potentially replace Russia's oil supply loss in 2022.

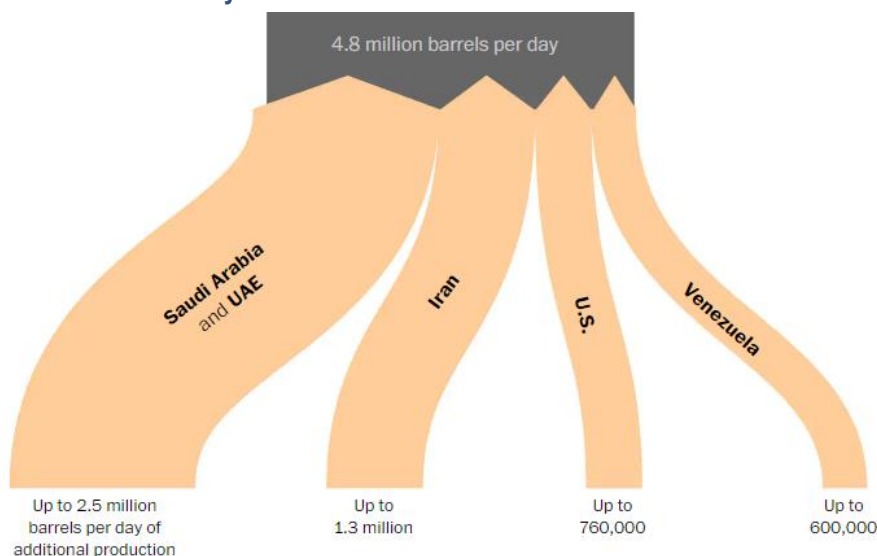
**OPEC (+2mbpd?):** Saudi Arabia and the UAE are likely to be two contenders for oil production increases in 2022, given their spare capacity of 2-2.5mbpd combined. Most of the spare capacity is in the hands of Saudi Arabia, while the UAE is able to increase its oil production by 0.4mbpd, according to the International Energy Agency (IEA). However, we think the possibility of an oil production increase from OPEC is low based on the recent rejections by Saudi Arabia and the UAE to the request made by the US and UK to raise their oil production levels.

**Iran (+1.3mbpd?):** It remains difficult, if not impossible, for Iran to raise its oil production output in 2022, considering that 1) the negotiations over Iran's nuclear deal remain unsuccessful; and 2) the trade sanctions would have to be lifted by the US. The negotiations have been complicated by the fact that Russia must sign off on any accord with Iran. Last week, Russia presented its condition that the US guarantees that the sanctions that have been imposed on Russia for its invasion of Ukraine will not be applied to Russian trade and investment with Iran. Even if this condition is met, Iran could raise its oil production by as much as 1.3mbpd in 2022, based on the EIA's estimate.

The oil production from OPEC has continued to struggle to meet the group's own production targets, with political upheaval continue to disrupt oil production. In Dec-21, oil output rose by only 0.25mbpd vs the targeted 0.4mbpd increase, with the production level worsening with the loss of 0.3mbpd of oil production from Libya.

**Venezuela (+0.6mbpd?):** Though one of the five founding members of OPEC, Venezuela has long suffered from poor management and tough US sanctions, thereby constraining its ability to produce a higher oil output in a short period, similar to what Saudi Arabia could achieve. Its wells need extensive maintenance and capital investment to boost its oil production level, but assuming that sufficient Western assistance could be provided to Venezuela, the country could increase its oil production by as much as 0.6mbpd within less than one year, according to the EIA's estimate.

### Exhibit 33: Only a few countries have the ability to boost their production to replace the Russian oil cut off by sanctions



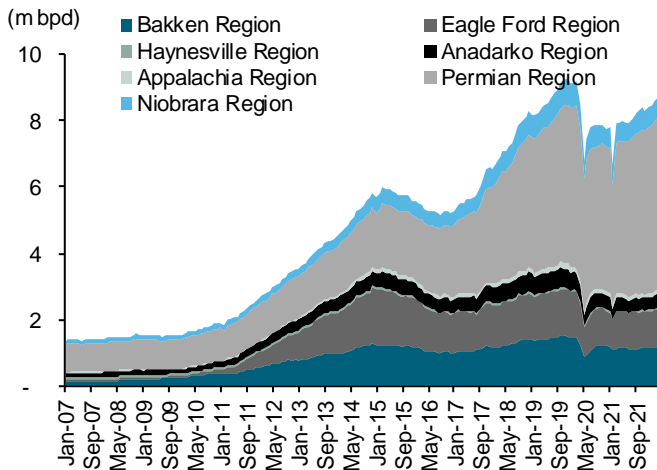
Source: [Washington Post](#)

### Could US shale oil be a global white knight to fill up Russia's oil supply gap?

The US has long been anticipated by the market to become a global marginal source of oil based on its proven track record of ramping up its oil production within a short period. However, since the oil price collapse in 4Q14, US shale oil production has been increasing at a much lower rate than its previous growth rates before the 2014 oil price crisis. Why?

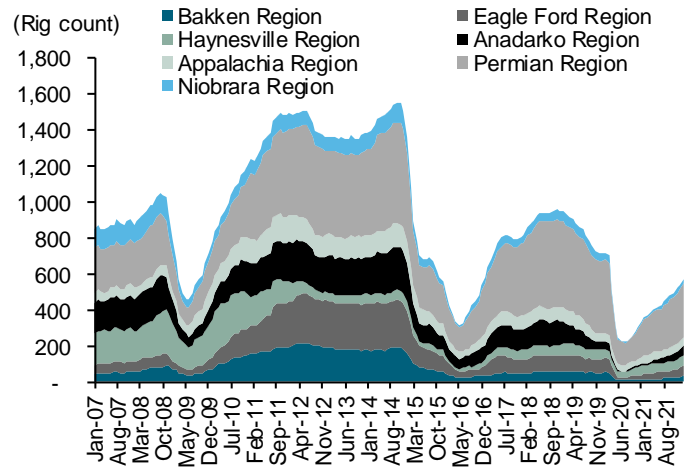
Most US shale oil producers are listed companies with shareholders' stakes as their short-term focus, rather than long-term oil production growth, given the higher uncertainty of the oil price outlook.

**Exhibit 34: US shale oil production by region**



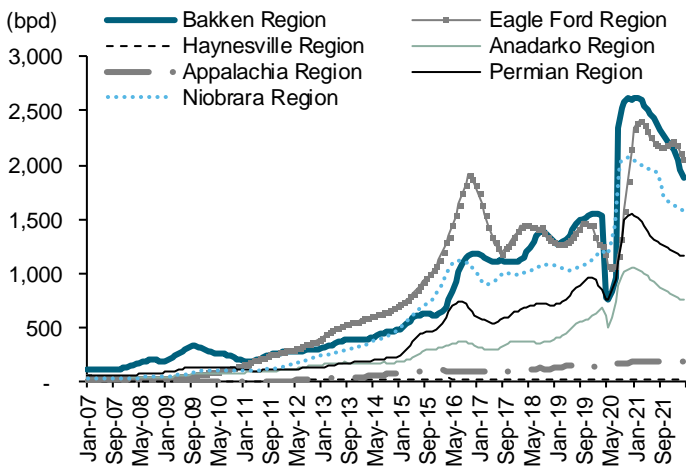
Source: EIA

**Exhibit 35: US shale oil rig count**



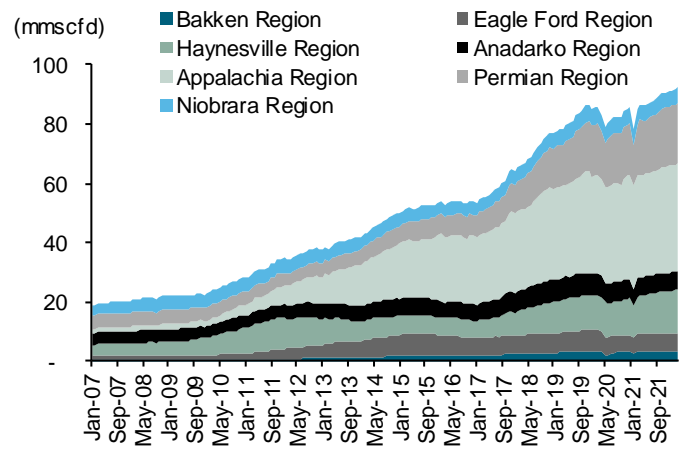
Source: EIA

**Exhibit 36: Shale oil production per rig**



Source: EIA

**Exhibit 37: US shale gas production by region**

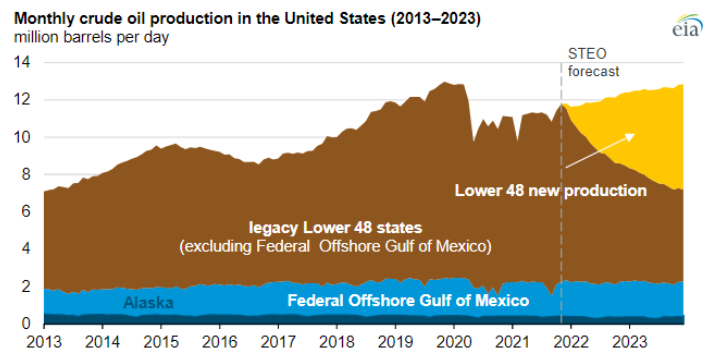


Source: EIA

**0.8mbpd of oil supply growth from US shale oil.** The EIA estimates that in 2022 the US shale oil volume could increase by 0.8mbpd, bringing the total oil production to 12mbpd. Even in the best-case scenario, the EIA expects up to a 1mbpd increase in shale oil production based on the current drilled-but-uncompleted (DUC) oil rigs as a key gauge for the future oil production volume.

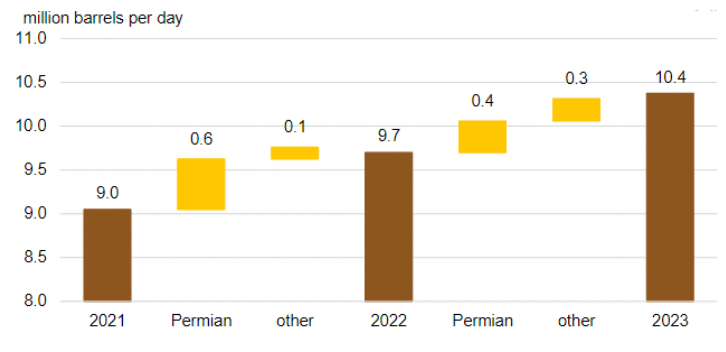
The Permian shale oil area remains the key growth driver for US oil production, with 0.6mbpd of growth estimated in 2022 and 0.4mbpd in 2023, based on the West Texas Intermediate (WTI) crude oil price average of USD79/bbl in 2022 and USD64/bbl in 2023.

**Exhibit 38: US crude oil production growth in 2022-23 expected to reach record high levels by end-2023**



Source: [EIA](#)

**Exhibit 39: Projected oil production increases in US' lower 48 states in 2022-23**



Source: [EIA](#)

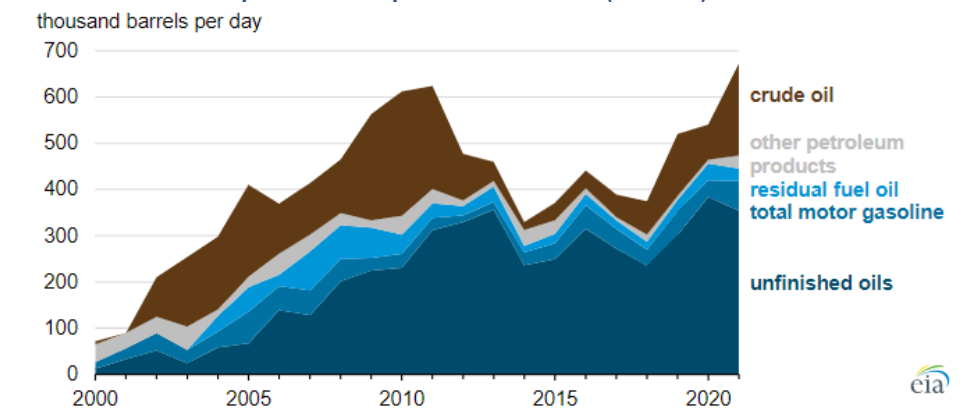
**The US imports more petroleum products than crude oil from Russia**

While the US imported only a small share of crude oil from Russia, it imported a much larger portion of refined oil products from Russia, mainly unfinished oils and fuel oils as feedstocks for US refineries as a supplement to crude oil in the refining process. On 8 Mar-22, the US announced a ban on the imports of Russian crude oil, petroleum products, coal, and gas, in response to Russia's invasion of Ukraine.

In 2021, imports from Russia accounted for 8% of all US petroleum imports, which include a 3% share of crude imports and a 20% share of petroleum product imports. Over 50% of the imported petroleum products from Russia were "unfinished oils", with most of these being classified as Mazut-100 fuel oil, or M-100, consumed as supplementary refinery input and has qualities similar to a heavier, relatively high-sulphur crude oil.

Hence, the US sanctions on Russia for petroleum imports could lead to a heavy crude shortage, which could jeopardize the US oil product supply, in our view.

**Exhibit 40: US total petroleum imports from Russia (2000-21)**



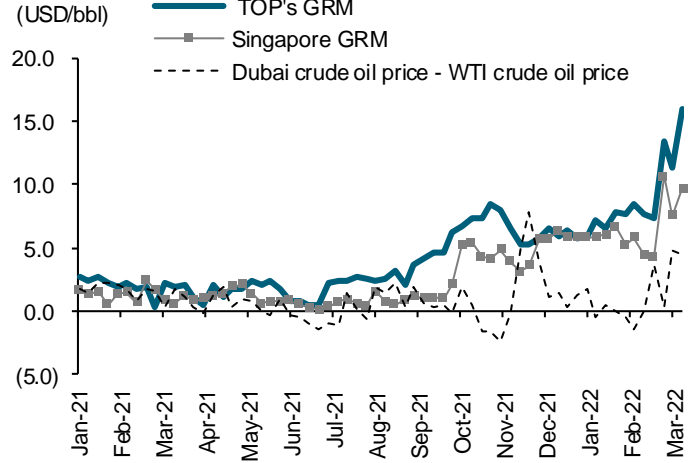
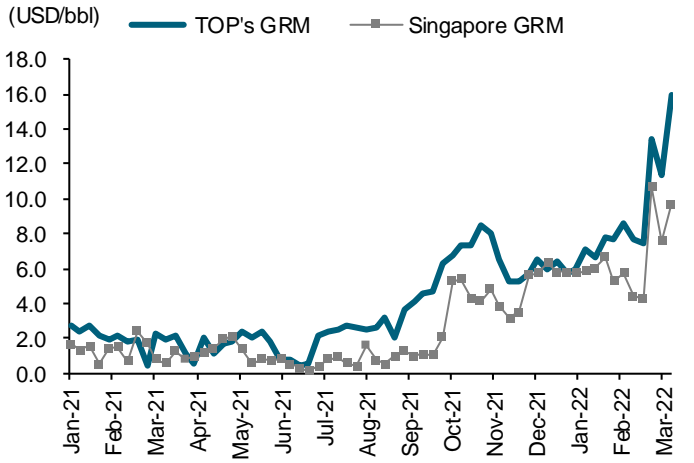
Source: [EIA](#)

### Refineries: on the uptrend in 2022

Since Feb-22, the market gross refining margin (GRM) of Thai refinery companies has continued to rise, jumping by 2x from the USD6-8/bbl range in 4Q21 to Jan-22. This is in line with our expectation that the GRM would rise significantly in 2022, driven by the much wider margins of oil products over crude oil prices, despite the sharp rise in the crude oil price due to the higher global supply risk.

**Exhibit 41: TOP's GRM vs Singapore GRM (daily)**

**Exhibit 42: TOP's GRM vs Singapore GRM (weekly)**

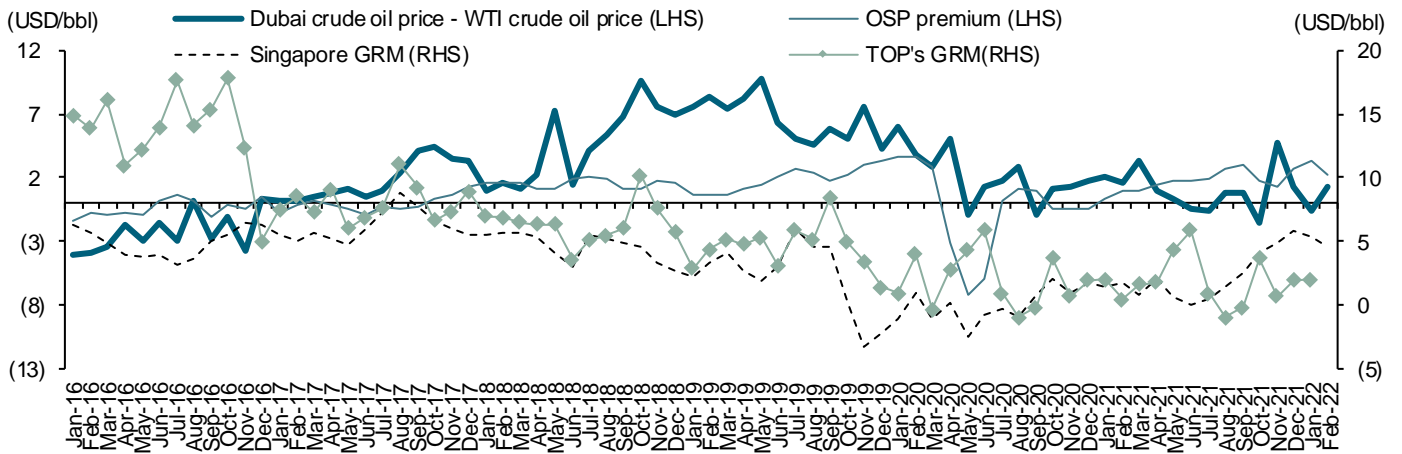


Source: Bloomberg

Source: Bloomberg

Meanwhile, on the cost side, crude premiums, represented by the Official Selling Price (OSP) announced monthly in advance by Saudi Arabia for its major oil types, have almost doubled m-m to USD4.9/bbl after the US and its European allies imposed sanctions in response to Russia's invasion of Ukraine.

**Exhibit 43: Dubai-WTI crude premium, Singapore GRM and TOP's GRM**



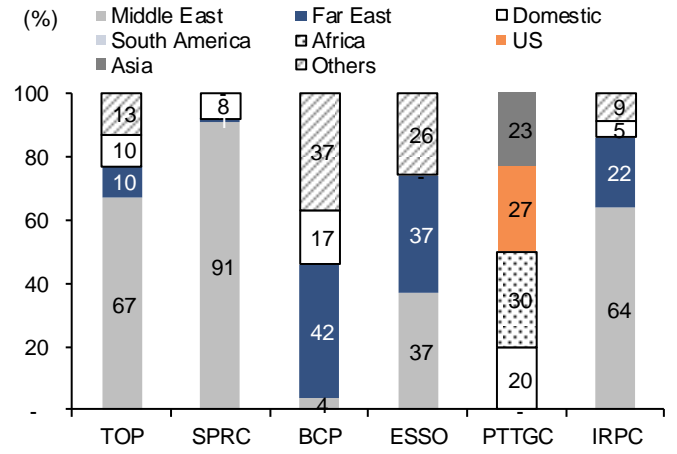
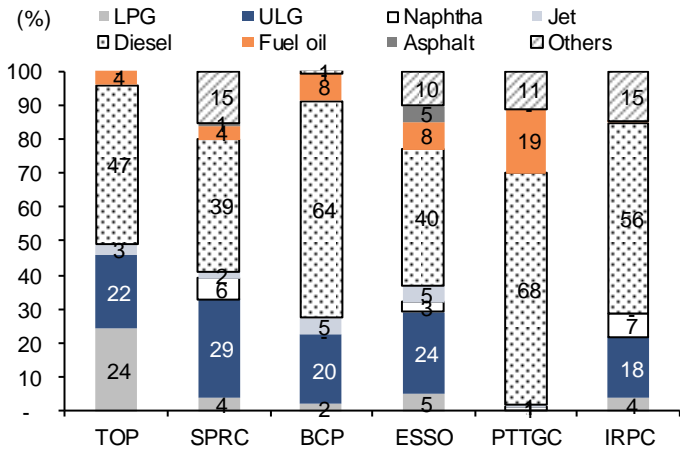
Source: Bloomberg



As most Thai refiners, except Bangchak Corporation (BCP TB, BUY) and PTT Global Chemical (PTTGC TB, BUY), consume crudes imported from Middle East (ME) producers in the range of 64% (IRPC Pcl (IRPC TB, BUY)) to 91% (Star Petroleum Refining (SPRC TB, BUY)), the higher OSP would lead to higher crude costs and could offset the positive impact of the higher product margins.

**Exhibit 44: Production yields of Thai refiners as of 2021**

**Exhibit 45: Crude mix breakdown of Thai refiners as of 2021**

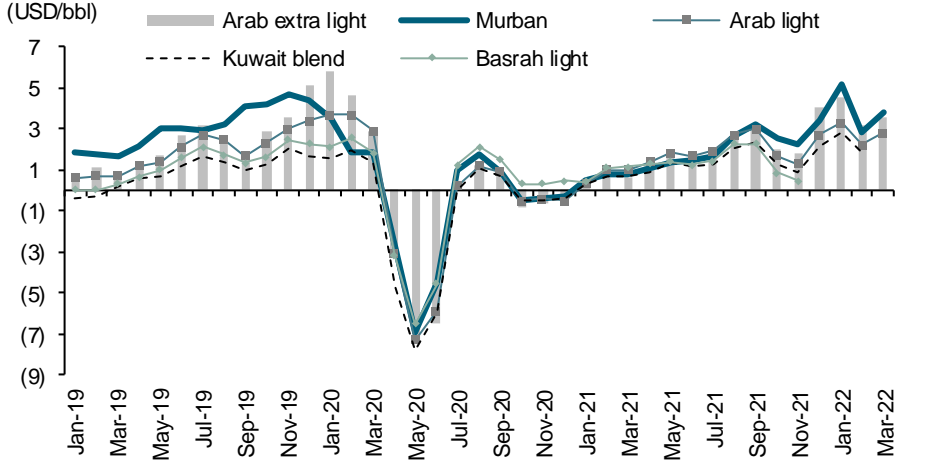


Source: Companies

Source: Companies

However, we estimate an increase in the crude cost by USD0.7/bbl for Esso Thailand (ESSO TB, BUY) (37% ME crude) to USD2/bbl for SPRC (91% ME crude), which should be more than offset by USD3-6/bbl higher market GRMs, based on projected USD10-20/bbl higher margins of oil products over crude price.

**Exhibit 46: Crude premiums of Middle East producers**

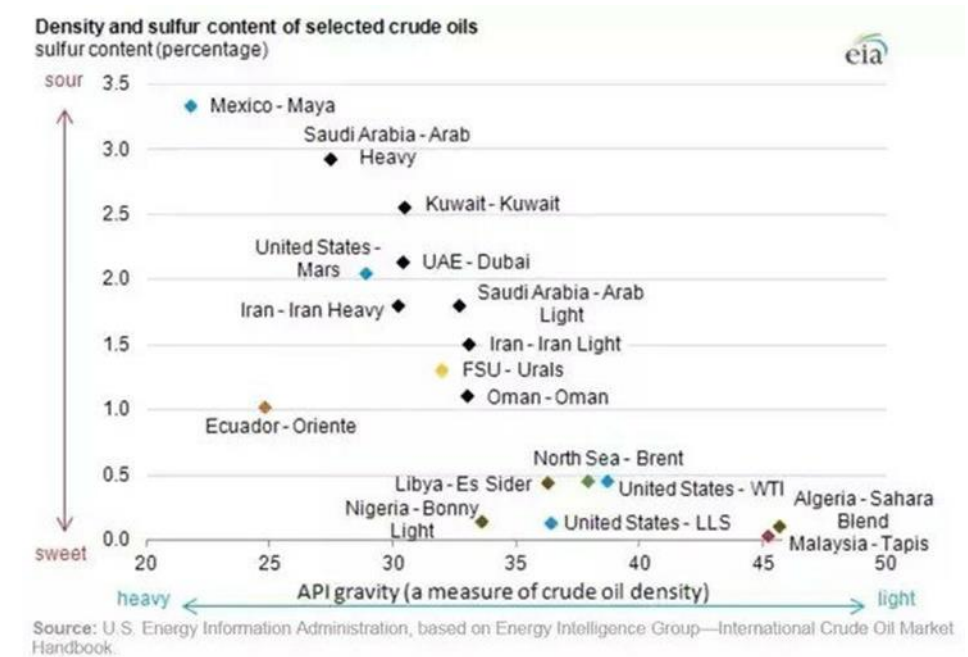


Source: TOP

**Impact of Urals crude supply risk.** Russia's major crude type is Urals which accounts for over 80% of Russia's crude oil exports and covered 31% of European needs in 2021, according to the EIA. The world's largest Urals crude producers are Rosneft, Lukoil, Surgutneftegaz, Gazprom, and Tatneft.

Urals crude is a medium-sour crude with an API of 36.8 and 1.48% sulphur vs North Sea Brent's API of 38 and 0.5% sulphur and US WTI's API of 39 and 0.5% sulphur content. Urals crude is predominantly used in Eastern and Central Europe and in the Mediterranean.

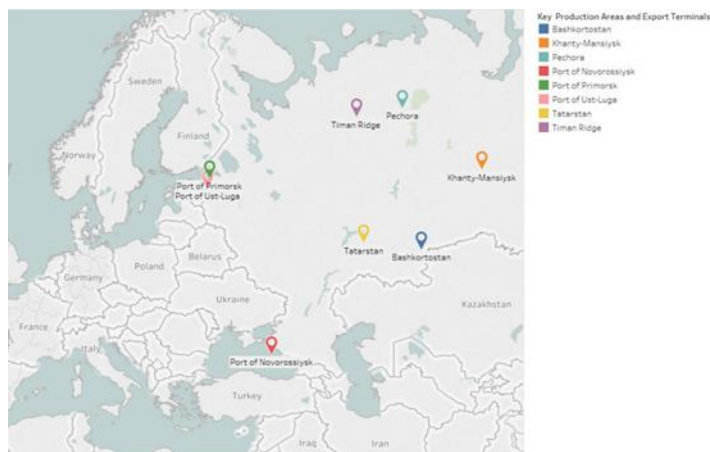
**Exhibit 47: Density and sulphur content of selected crude oils**



Source: EIA

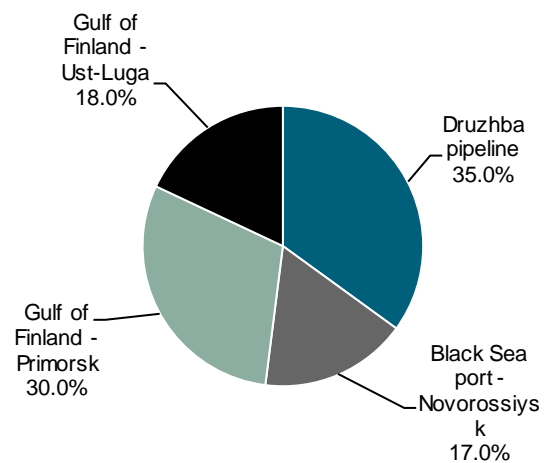
According to the EIA, Urals crude is exported mainly via the Druzhba pipeline (35%), and the rest is exported through three major ports – one in the Black Sea port of Novorossiysk and two ports in the Gulf of Finland.

**Exhibit 48: Geographic location of Urals crude production and export terminals**



Source: EIA

**Exhibit 49: Urals crude export flows**

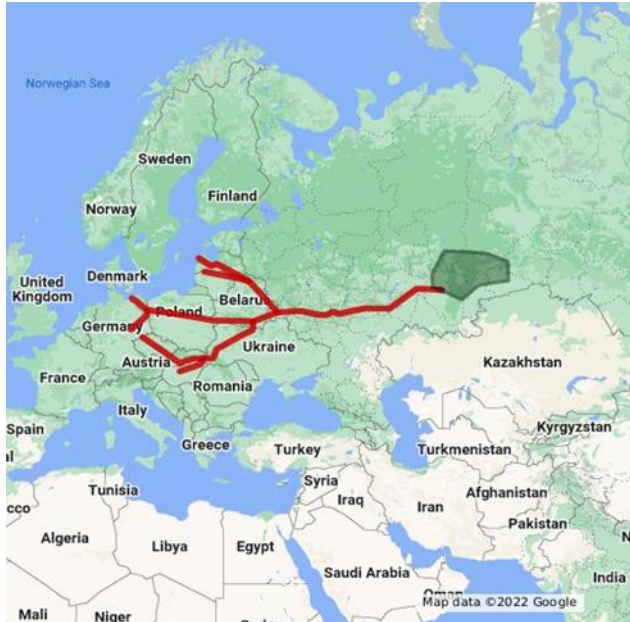


Source: EIA

With the sanctions by the US, EU, and other US allies, we think Russia is likely to face logistics difficulty to export its Urals crude to the market via the Druzhba pipeline, which transports crude oil from Russia's oil fields in western Siberia to a number of major European cities. The Druzhba pipeline runs through Belarus and part of Ukraine to many markets such as Berlin, Warsaw, Budapest, and Bratislava.

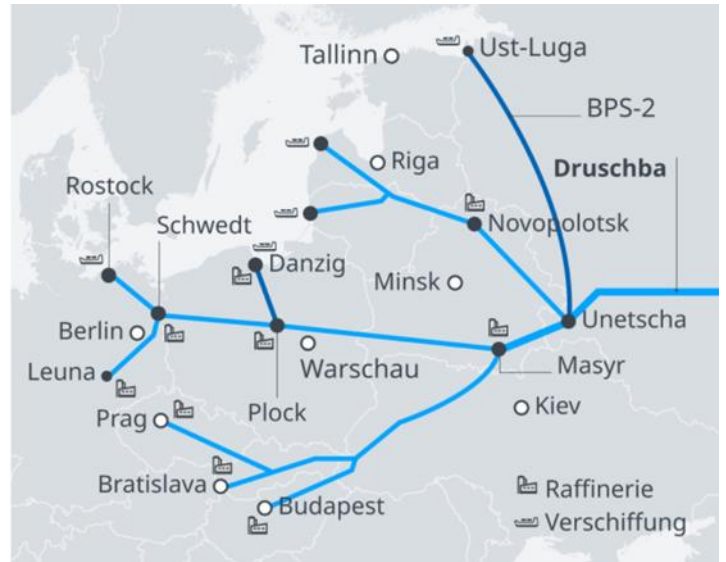
The remaining 65% of Urals crude exports should continue safely given that Finland is a neutral country and the Black Sea port remains a safe place for Russia, possibly via Turkey, which has its own interests that vary from those of the US.

Exhibit 50: Druzhba pipeline system



Source: Google Maps

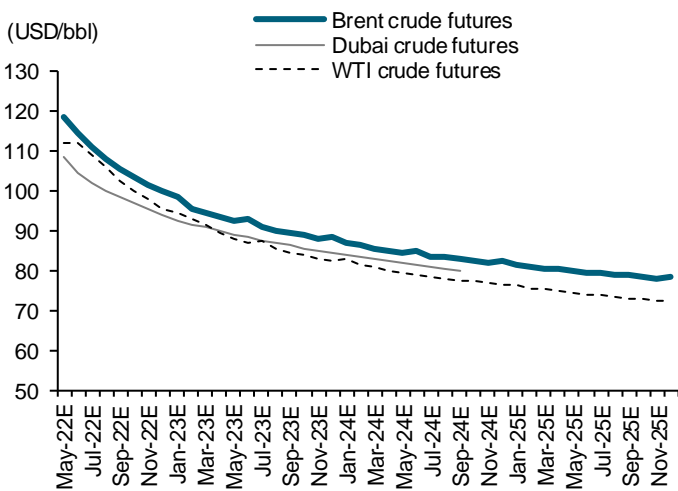
Exhibit 51: Druzhba pipeline system to major European cities



Source: Allinfo

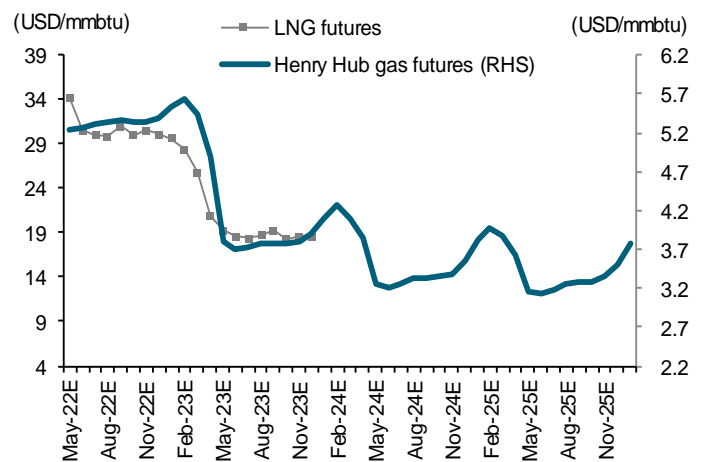
**Impact on crude price and premiums from Russia's oil supply risk.** With Russian crude exports suddenly being cut due to sanctions, the prices of global crudes have all risen to close to USD120/bbl as of 23 Mar-22. Meanwhile, the premiums have spiked for the crudes with equivalent quality to Urals, such as Saudi Arabia's Arab Light and other light crudes like Murban, as refiners seek alternative crudes for their production, particularly in Europe.

Exhibit 52: Futures – Brent, Dubai, WTI crude price



Price as of 23 March 2022  
Source: Bloomberg

Exhibit 53: Futures – LNG contract price and Henry Hub gas price



Price as of 23 March 2022  
Source: Bloomberg

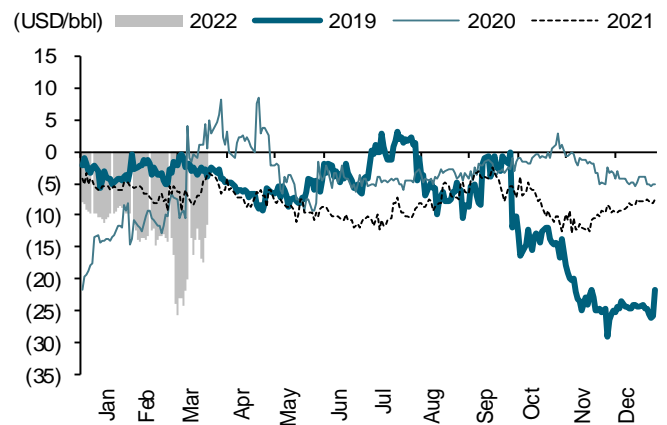
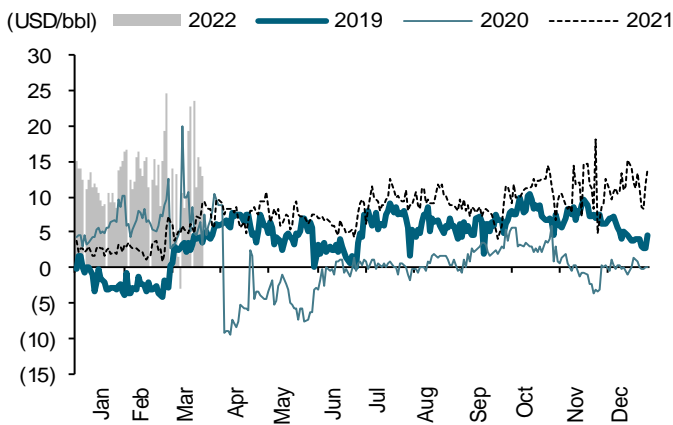
**Product margins jumped and margins likely to stay afloat in 2022.** With the combined impact of the supply risk from Russia and continued limited supply growth from OPEC+ vs continued demand growth, the margins of all petroleum products have risen markedly since Jan-22.

Ahead of the industry restocking for the upcoming seasonally high demand for the US driving season, the gasoline-Dubai margin has shot up to over USD20/bbl for the first time since 2019. We expect the gasoline-Dubai margin to stay high at over USD20/bbl throughout 2022, driven by strong demand during the driving season in Apr-Sep 2022 and the global demand recovery post the Covid pandemic.

In contrast, the margin of high sulphur fuel oil (HSFO)-Dubai has plunged to negative USD15-25/bbl as a result of the weak demand from the shipping industry due to the global logistics disruptions that have continued since the beginning of the pandemic in 2020. However, the margin of HSFO-Dubai should improve to negative USD10-15/bbl by 2H22 as we expect the demand from the shipping industry to return once the pandemic eventually becomes an endemic disease, according to the World Health Organization.

**Exhibit 54: 92 Octane gasoline price – Dubai crude oil price**

**Exhibit 55: High sulphur fuel oil SG – Dubai crude price**



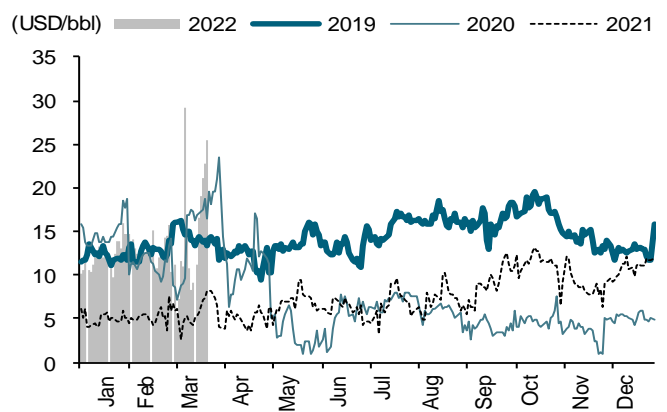
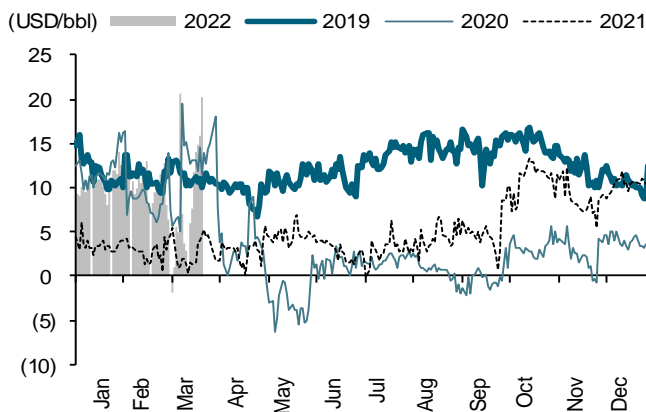
Source: Bloomberg

Source: Bloomberg

Margins for middle distillates have spiked even higher than gasoline, a key fuel for transportation, rising to over USD25/bbl for diesel-Dubai and USD20/bbl for jet-Dubai. We project the margins of both diesel-Dubai and jet-Dubai to stay high at over USD25/bbl in 2022, backed by a stronger demand for jet fuel, which is projected to rise by 2-3mbpd y-y in 2022, based on the EIA's estimate, and diesel for higher industrial production in 2H22 onward after the pandemic becomes an endemic disease.

**Exhibit 56: Jet Kerosene price – Dubai crude oil price**

**Exhibit 57: Gasoil 0.5% sulphur SG price – Dubai crude price**



Source: Bloomberg

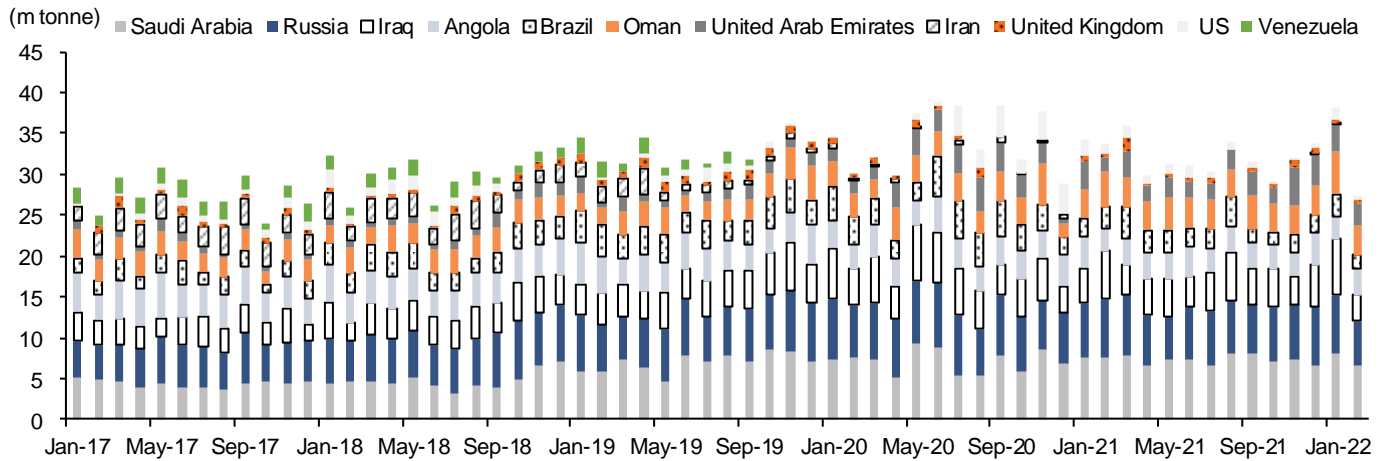
Source: Bloomberg

### China could be a white knight for global crude and refinery industry in 2022

As a close ally with Russia and one of the world’s largest consumers of crude and refined oil products, we believe China could emerge to be a “white knight” for the global oil industry in 2022.

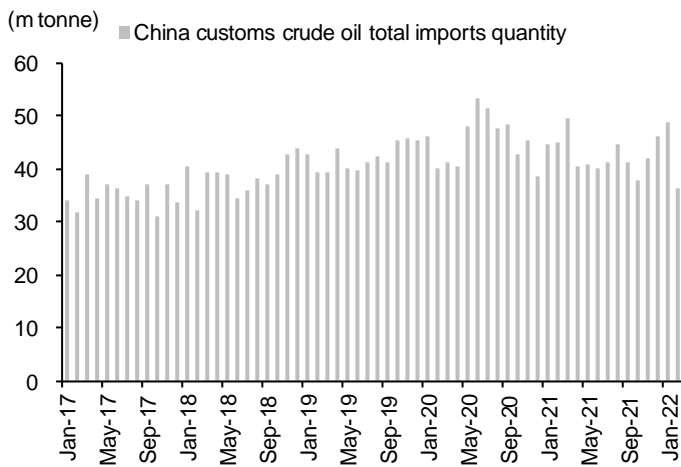
For the crude oil market, we expect China to increase its imports of both oil and gas from Russia, mostly via pipelines connecting central Asia to China. As of Feb-22, China imports 28-35m tonnes (mt) of monthly crude volume, mostly from Saudi Arabia and Russia, which together account for almost half of China’s crude imports. Other members of OPEC including Iraq, the UAE, Oman, Angola, and Iran, all export high portions of crude to China.

**Exhibit 58: Breakdown of China’s crude imports from 10 main countries**



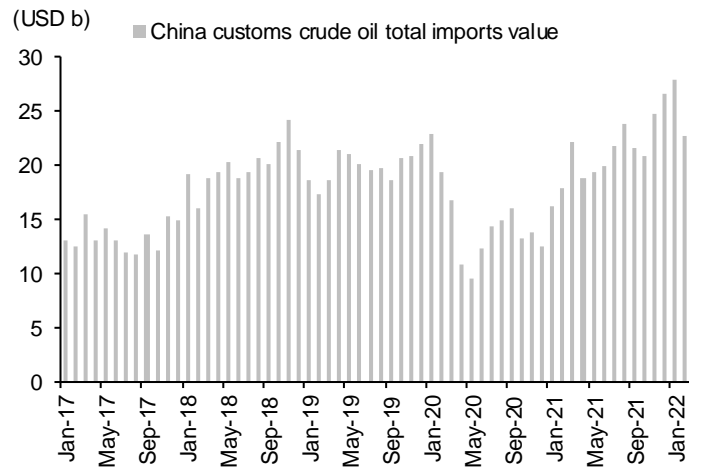
Source: Bloomberg

**Exhibit 59: China customs crude oil total import quantity**



Source: Bloomberg

**Exhibit 60: China customs crude oil total import value**

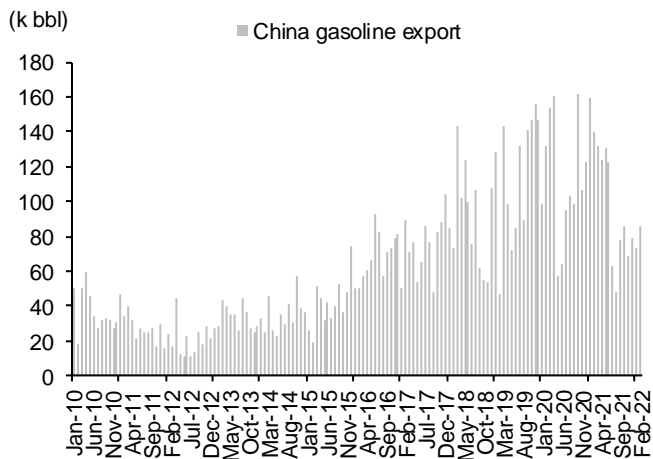


Source: Bloomberg

For refineries, China has significantly reduced its exports of refined oil products since mid-2021 as a result of the power shortage in 2H21 and the intermittent lockdowns under its zero-Covid policy. The sharp rise in the crude oil price has further cut China's refinery production in Feb-Mar 2022 as the suboptimal refineries or "teapots" have all reduced their running rates in response to the weak economic returns of their market GRMs.

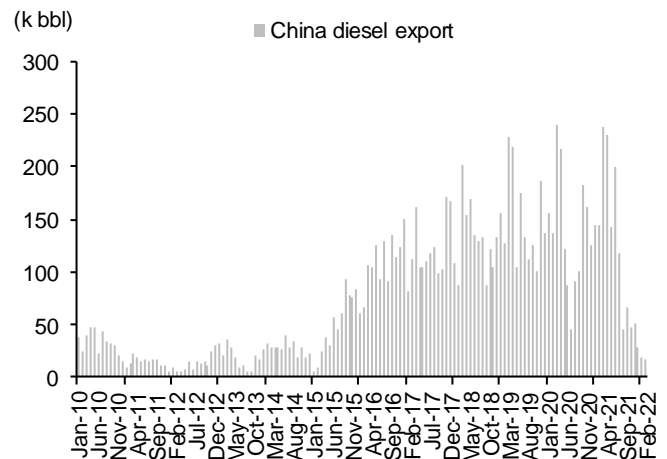
According to the EIA, China now is likely to reduce its exports of diesel and gasoline in 2022 given 1) its projected strong demand growth for the domestic market post the pandemic in 2H22; and 2) China's "dual policy" to constrain the production of industries that consume more energy such as the carbide or coal-based polyvinylchloride (PVC) industry, the steel industry, and the refinery industry, mainly for low-efficiency refiners.

**Exhibit 61: China's gasoline exports**



Source: Bloomberg

**Exhibit 62: China's diesel exports**



Source: Bloomberg

## Revised up oil price and GRM assumptions

We raise our Dubai oil price assumptions for 2022-24 by 28.6%-33.3% to USD100/90/90 per bbl to reflect the impact of the supply risk from the sanctions placed on Russia.

We also raise our Singapore GRM assumptions by 11-17% to incorporate our higher margin estimates for oil products following our more positive outlook on the margins of gasoline, diesel, and jet fuel due to the tighter supply and higher demand growth.

Finally, we raise our assumptions for the crude premiums of Murban crude, which is the major crude used by most Thai refiners including Thai Oil (TOP TB, BUY), SPRC, and IRPC. This reflects the recent hike in the crude premiums for the crudes produced and sold by Saudi Arabia.

**Exhibit 63: Changes in key assumptions**

	Current			Previous			Change		
	2022E	2023E	2024E	2022E	2023E	2024E	2022E	2023E	2024E
	(USD/bbl)	(USD/bbl)	(USD/bbl)	(USD/bbl)	(USD/bbl)	(USD/bbl)	(%)	(%)	(%)
Dubai crude oil price	100.0	90.0	90.0	75.0	70.0	70.0	33.3	28.6	28.6
Singapore GRM	10.0	8.0	7.0	9.0	7.0	6.0	11.1	14.3	16.7
Gasoline-Dubai	20.0	18.0	16.0	17.0	15.0	15.0	17.6	20.0	6.7
Diesel-Dubai	24.0	22.0	20.0	20.0	18.0	18.0	20.0	22.2	11.1
Jet-Dubai	23.0	22.0	20.0	20.0	18.0	18.0	15.0	22.2	11.1
HSFO-Dubai	(15.0)	(12.0)	(12.0)	(12.0)	(10.0)	(10.0)	25.0	20.0	20.0
Crude premium (Murban)	4.0	3.0	2.0	3.0	2.0	2.0	33.3	50.0	-

Source: FSSIA estimates

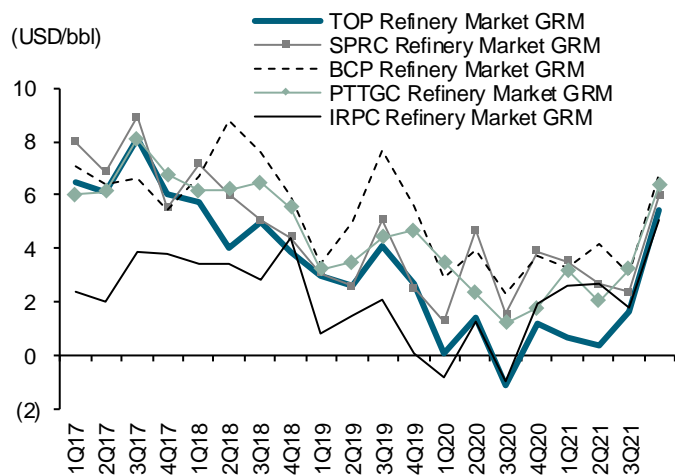
### Winners and losers under the high oil price and GRM landscape

With potential upsides to the earnings of all refinery companies from higher GRM and inventory gains, we prefer the downstream refinery sector over upstream oil & gas as we project the demand growth to outpace the supply growth for both oil and oil products.

We expect the key drivers for a higher and sustainable GRM in 2022 to come from:

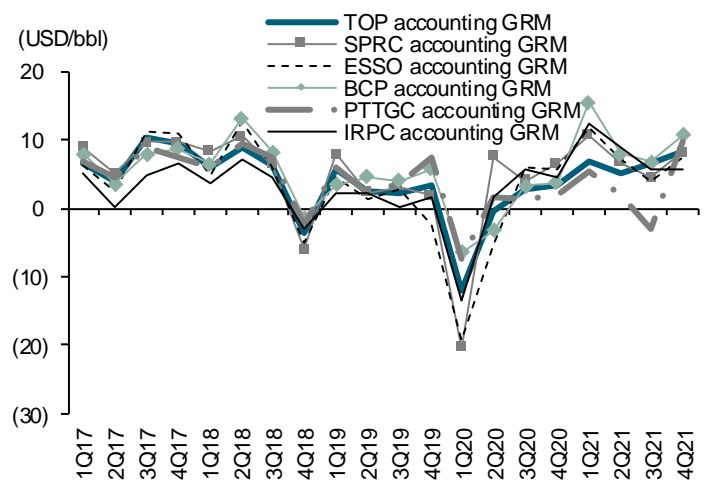
- 1) Demand growth for jet fuel by 2-3mbpd, based on the EIA's estimate, as the number of international flights is likely to surge markedly by 2H22 as pandemic fears are likely to disappear as Covid becomes an endemic disease;
- 2) Supply growth should decline y-y as a result of the sanctions on Russia which will likely lead to refinery operation disruptions due to the Urals crude shortage, particularly for the landlocked refineries in Europe that have a captive demand for Russian crude and the US refineries that require additional medium and sour crudes to replace Russia's Urals crude supply.

Exhibit 64: Refinery market GRM



Source: Companies

Exhibit 65: Accounting GRM

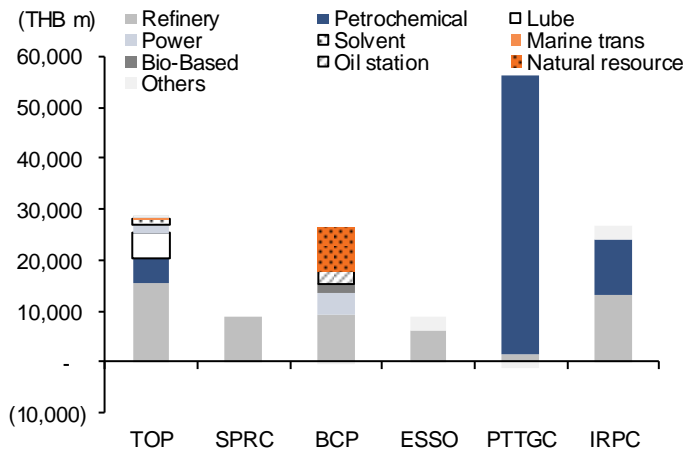


Source: Companies

ESSO and BCP are our top picks. Among six refinery companies in Thailand, we prefer the refiners with downstream oil stations, ESSO and BCP, based on:

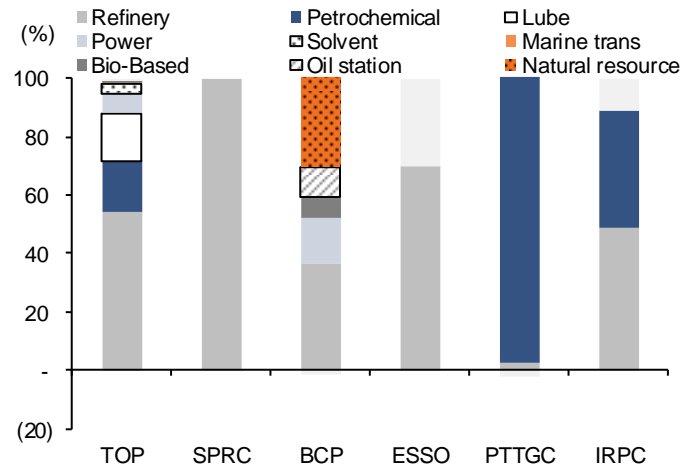
- 1) Upsides from the GRM strengths expected in 2022, driven by higher margins of gasoline, diesel, and jet over Dubai crude cost;
- 2) Less exposures to ME crudes, which are expected to see higher crude premiums. Unlike local peers with higher ME crude exposures, TOP (67%), SPRC (91%), and IRPC (64%), ESSO and BCP consume less ME crude at 34% and 4%, respectively. Hence, we think both ESSO and BCP will see a lower impact from higher OSPs that would lead to higher crude costs and offset the positive impact of the higher product margins;
- 3) Unlike TOP, IPRC, and PTTGC, ESSO and BCP have no exposure to the aromatics products whose margins remain under pressure due to the significant oversupply outlook in 2022-24. While ESSO has a 0.5mtpa capacity of paraxylene, it mothballed the operation in 2H21, thereby incurring only a small loss of THB0.1b annually, based on our estimate.

**Exhibit 66: EBITDA breakdown of Thai refiners**



Source: Companies

**Exhibit 67: EBITDA breakdown of Thai refiners (%)**



Source: Companies



## Corporate Governance report of Thai listed companies 2020

EXCELLENT LEVEL										
AAV	ADVANC	AF	AIRA	AKP	AKR	ALT	AMA	AMATA	AMATAV	ANAN
AOT	AP	ARIP	ARROW	ASP	BAFS	BANPU	BAY	BCP	BCPG	BDMS
BEC	BEM	BGRIM	BIZ	BKI	BLA	BOL	BPP	BRR	BTS	BWG
CENTEL	CFRESH	CHEWA	CHO	CIMBT	CK	CKP	CM	CNT	COL	COMAN
COTTO	CPALL	CPF	CPI	CPN	CSS	DELTA	DEMCO	DRT	DTAC	DTC
DV8	EA	EASTW	ECF	ECL	EGCO	EPG	ETE	FNS	FPI	FPT
FSMART	GBX	GC	GCAP	GEL	GFPT	GGC	GPSC	GRAMMY	GUNKUL	HANA
HARN	HMPRO	ICC	ICI	III	ILINK	INTUCH	IRPC	IVL	JKN	JSP
JWD	K	KBANK	KCE	KKP	KSL	KTB	KTC	LANNA	LH	LHFG
LIT	LPN	MAKRO	MALEE	MBK	MBKET	MC	MCOT	METCO	MFEC	MINT
MONO	MOONG	MSC	MTC	NCH	NCL	NEP	NKI	NOBLE	NSI	NVD
NYT	OISHI	ORI	OTO	PAP	PAP	PCSGH	PDJ	PG	PHOL	PLANB
PLAT	PORT	PPS	PR9	PREB	PRG	PRM	PSH	PSL	PTG	PTT
PTTEP	PTTGC	PYLON	Q-CON	QH	QTC	RATCH	RS	S	S & J	SAAM
SABINA	SAMART	SAMTEL	SAT	SC	SCB	SCC	SCCC	SCG	SCN	SDC
SEAFCO	SEOIL	SE-ED	SELIC	SENA	SIRI	SIS	SITHAI	SMK	SMPC	SNC
SONIC	SORKON	SPALI	SPI	SPRC	SPVI	SSSC	SST	STA	SUSCO	SUTHA
SVI	SYMC	SYNTEC	TACC	TASCO	TCAP	TFMAMA	THANA	THANI	THCOM	THG
THIP	THRE	THREL	TIP	TIPCO	TISCO	TK	TKT	TTB	TMILL	TNDT
TNL	TOA	TOP	TPBI	TQM	TRC	TSC	TSR	TSTE	TSTH	TTA
TTCL	TTW	TU	TVD	TVI	TVO	TWPC	U	UAC	UBIS	UV
VGI	VIH	WACOAL	WAVE	WHA	WHAUP	WICE	WINNER	TRUE		

VERY GOOD LEVEL										
2S	ABM	ACE	ACG	ADB	AEC	AEONTS	AGE	AH	AHC	AIT
ALLA	AMANAHA	AMARIN	APCO	APCS	APURE	AQUA	ASAP	ASEFA	ASIA	ASIAN
ASIMAR	ASK	ASN	ATP30	AUCT	AWC	AYUD	B	BA	BAM	BBL
BFIT	BGC	BJC	BJCHI	BROOK	BTW	CBG	CEN	CGH	CHARAN	CHAYO
CHG	CHOTI	CHOW	CI	CIG	CMC	COLOR	COM7	CPL	CRC	CRD
CSC	CSP	CWT	DCC	DCON	DDD	DOD	DOHOME	EASON	EE	ERW
ESTAR	FE	FLOYD	FN	FORTH	FSS	FTE	FVC	GENCO	GJS	GL
GLAND	GLOBAL	GLOCON	GPI	GULF	GYT	HPT	HTC	ICN	IFS	ILM
IMH	INET	INSURE	IRC	IRCP	IT	ITD	ITEL	J	JAS	JCK
JCKH	JMART	JMT	KBS	KCAR	KGI	KIAT	KOOL	KTIS	KWC	KWM
L&E	LALIN	LDC	LHK	LOXLEY	LPH	LRH	LST	M	MACO	MAJOR
MBAX	MEGA	META	MFC	MGT	MILL	MITSIB	MK	MODERN	MTI	MVP
NETBAY	NEX	NINE	NTV	NWR	OCC	OGC	OSP	PATO	PB	PDG
PDI	PICO	PIMO	PJW	PL	PM	PPP	PRIN	PRINC	PSTC	PT
QLT	RCL	RICHY	RML	RPC	RWI	S11	SALEE	SAMCO	SANKO	SAPPE
SAWAD	SCI	SCP	SE	SEG	SFP	SGF	SHR	SIAM	SINGER	SKE
SKR	SKY	SMIT	SMT	SNP	SPA	SPC	SPCG	SR	SRICHA	SSC
SSF	STANLY	STI	STPI	SUC	SUN	SYNEX	T	TAE	TAKUNI	TBSP
TCC	TCMC	TEAM	TEAMG	TFG	TIGER	TITLE	TKN	TKS	TM	TMC
TMD	TMI	TMT	TNITY	TNP	TNR	TOG	TPA	TPAC	TPCORP	TPOLY
TPS	TRITN	TRT	TRU	TSE	TVT	TWP	UEC	UMI	UOBKH	UP
UPF	UPOIC	UT	UTP	UWC	VL	VNT	VPO	WIJK	WP	XO
YUASA	ZEN	ZIGA	ZMICO							

GOOD LEVEL										
7UP	A	ABICO	AJ	ALL	ALUCON	AMC	APP	ARIN	AS	AU
B52	BC	BCH	BEAUTY	BGT	BH	BIG	BKD	BLAND	BM	BR
BROCK	BSBM	BSM	BTNC	CAZ	CCP	CGD	CITY	CMAN	CMO	CMR
CPT	CPW	CRANE	CSR	D	EKH	EP	ESSO	FMT	GIFT	GREEN
GSC	GTB	HTECH	HUMAN	IHL	INOX	INSET	IP	JTS	JUBILE	KASET
KCM	KKC	KUMWEL	KUN	KWG	KYE	LEE	MATCH	MATI	M-CHAI	MCS
MDX	MJD	MM	MORE	NC	NDR	NER	NFC	NNCL	NPK	NUSA
OCEAN	PAF	PF	PK	PLE	PMTA	POST	PPM	PRAKIT	PRECHA	PRIME
PROUD	PTL	RBF	RCI	RJH	ROJNA	RP	RPH	RSP	SF	SFLEX
SGP	SISB	SKN	SLP	SMART	SOLAR	SPG	SQ	SSP	STARK	STC
SUPER	SVOA	TC	TCCC	THMUI	TIW	TNH	TOPP	TPCH	TIPIP	TPLAS
TTI	TYCN	UKEM	UMS	VCOM	VRANDA	WIN	WORK	WPH		

## Description

## Score Range

Excellent

90-100

Very Good

80-89

Good

70-79

## Disclaimer:

The disclosure of the survey results of the Thai Institute of Directors Association ("IOD") regarding corporate governance is made pursuant to the policy of the Office of the Securities and Exchange Commission. The survey of the IOD is based on the information of a company listed on the Stock Exchange of Thailand and the Market for Alternative Investment disclosed to the public and able to be accessed by a general public investor. The result, therefore, is from the perspective of a third party. It is not an evaluation of operation and is not based on inside information.

The survey result is as of the date appearing in the Corporate Governance Report of Thai Listed Companies. As a result, the survey results may be changed after that date. FSS International Investment Advisory Company Limited does not confirm nor certify the accuracy of such survey results.

\* CGR scoring should be considered with news regarding wrong doing of the company or director or executive of the company such unfair practice on securities trading, fraud, and corruption SEC imposed a civil sanction against insider trading of director and executive; \*\* delisted

Source: Thai Institute of Directors Association (IOD); FSSIA's compilation

## Anti-corruption Progress Indicator 2020

CERTIFIED										
2S	ADVANC	AI	AIE	AIRA	AKP	AMA	AMANAH	AP	AQUA	ARROW
ASK	ASP	AYUD	B	BAFS	BANPU	BAY	BBL	BCH	BCP	BCPG
BGC	BGRIM	BJCHI	BKI	BLA	BPP	BROOK	BRR	BSBM	BTS	BWG
CEN	CENTEL	CFRESH	CGH	CHEWA	CHOTI	CHOW	CIG	CIMBT	CM	CMC
COL	COM7	CPALL	CPF	CPI	CPN	CSC	DCC	DELTA	DEMCO	DIMET
DRT	DTAC	DTC	EASTW	ECL	EGCO	FE	FNS	FPI	FPT	FSS
FTE	GBX	GC	GCAP	GEL	GFPT	GGC	GJS	GPSC	GSTEEL	GUNKUL
HANA	HARN	HMPRO	HTC	ICC	ICHI	IFS	INET	INSURE	INTUCH	IRPC
ITEL	IVL	K	KASET	KBANK	KBS	KCAR	KCE	KGI	KKP	KSL
KTB	KTC	KWC	L&E	LANNA	LHFG	LHK	LPN	LRH	M	MAKRO
MALEE	MBAX	MBK	MBKET	MC	MCOT	MFC	MFEC	MINT	MONO	MOONG
MPG	MSC	MTC	MTI	NBC	NEP	NINE	NKI	NMG	NNCL	NSI
NWR	OCC	OCEAN	OGC	ORI	PAP	PATO	PB	PCSGH	PDG	PDI
PDJ	PE	PG	PHOL	PL	PLANB	PLANET	PLAT	PM	PPP	PPPM
PPS	PREB	PRG	PRINC	PRM	PSH	PSL	PSTC	PT	PTG	PTT
PTTEP	PTTGC	PYLON	Q-CON	QH	QLT	QTC	RATCH	RML	RWI	S & J
SABINA	SAT	SC	SCB	SCC	SCCC	SCG	SCN	SEAOIL	SE-ED	SELIC
SENA	SGP	SIRI	SITHAI	SMIT	SMK	SMPC	SNC	SNP	SORKON	SPACK
SPC	SPI	SPRC	SRICHA	SSF	SSSC	SST	STA	SUSCO	SVI	SYNTEC
TAE	TAKUNI	TASCO	TBSP	TCAP	TCMC	TFG	TFI	TFMAMA	THANI	THCOM
THIP	THRE	THREL	TIP	TIPCO	TISCO	TKT	TTB	TMD	TMILL	TMT
TNITY	TNL	TNP	TNR	TOG	TOP	TPA	TPCORP	TPP	TRU	TSC
TSTH	TTCL	TU	TVD	TVI	TVO	TWPC	U	UBIS	UEC	UKEM
UOBKH	UWC	VGI	VIH	VNT	WACOAL	WHA	WHAUP	WICE	WIJK	XO
ZEN	TRUE									

DECLARED										
7UP	ABICO	AF	ALT	AMARIN	AMATA	AMATAV	ANAN	APURE	B52	BKD
BM	BROCK	BUI	CHO	CI	COTTO	DDD	EA	EFORL	EP	ERW
ESTAR	ETE	EVER	FSMART	GPI	ILINK	IRC	J	JKN	JMART	JMT
JSP	JTS	KWG	LDC	MAJOR	META	NCL	NOBLE	NOK	PK	PLE
ROJNA	SAAM	SAPPE	SCI	SE	SHANG	SINGER	SKR	SPALI	SSP	STANLY
SUPER	SYNEX	THAI	TKS	TOPP	TRITN	TTA	UPF	UV	WIN	ZIGA

Level	
Certified	This level indicates practical participation with thoroughly examination in relation to the recommended procedures from the audit committee or the SEC's certified auditor, being a certified member of Thailand's Private Sector Collective Action Coalition Against Corruption programme (Thai CAC) or already passed examination to ensure independence from external parties.
Declared	This level indicates determination to participate in the Thailand's Private Sector Collective Action Coalition Against Corruption programme (Thai CAC)

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Note: Companies participating in Thailand's Private Sector Collective Action Coalition Against Corruption programme (Thai CAC) under Thai Institute of Directors (as of June 24, 2019) are categorised into: 1) companies that have declared their intention to join CAC, and; 2) companies certified by CAC.

Source: The Securities and Exchange Commission, Thailand; \* FSSIA's compilation

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Suwat Sinsadok, CFA, FRM, ERP FSS International Investment Advisory Securities Co., Ltd

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Company	Ticker	Price	Rating	Valuation & Risks
Esso Thailand	ESSO TB	THB 8.20	BUY	The downside risks to our SoTP-based TP on ESSO include 1) lower-than-expected demand for petroleum products; 2) a higher crude premium; and 3) unplanned shutdowns of its refinery and petrochemical plants..
Bangchak Corp	BCP TB	THB 30.25	BUY	The downside risks to our SoTP-based TP include: 1) lower-than-expected demand for petroleum products; 2) higher crude premiums; and 3) unplanned shutdowns of the company's refinery plants.
PTT Explor & Prod	PTTEP TB	THB 152.00	BUY	Risks our TP, which is based on EV/EBITDA, are a sharp decline in oil price and a potential earnings downside from government intervention.
Star Petroleum Refining	SPRC TB	THB 9.80	BUY	TP is based on EV/EBITDA. Downside risks are a sharp rise in oil price and weak demand for refined oil products.
Thai Oil	TOP TB	THB 53.75	BUY	Downside risks to our EV/EBITDA-based TP are a sharp rise in oil price and weak demand for refined oil products.
PTT Global Chemical	PTTGC TB	THB 50.75	BUY	The key downside risks to our EV/EBITDA-based TP are the weaker-than-expected HDPE price and HDPE-naphtha margin
IRPC PCL	IRPC TB	THB 3.58	BUY	Key risks to our positive view and EV/EBITDA-based target price are weaker-than-expected oil product demand growth and lower-than-expected PP-naphtha and SM-benzene margins.

Source: FSSIA estimates

### Additional Disclosures

Target price history, stock price charts, valuation and risk details, and equity rating histories applicable to each company rated in this report is available in our most recently published reports. You can contact the analyst named on the front of this note or your representative at Finansia Syrus Securities Public Company Limited

FSSIA may incorporate the recommendations and target prices of companies currently covered by FSS Research into equity research reports, denoted by an 'FSS' before the recommendation. FSS Research is part of Finansia Syrus Securities Public Company Limited, which is the parent company of FSSIA.

All share prices are as at market close on 23-Mar-2022 unless otherwise stated.

## RECOMMENDATION STRUCTURE

### Stock ratings

Stock ratings are based on absolute upside or downside, which we define as (target price\* - current price) / current price.

BUY (B). The upside is 10% or more.

HOLD (H). The upside or downside is less than 10%.

REDUCE (R). The downside is 10% or more.

Unless otherwise specified, these recommendations are set with a 12-month horizon. Thus, it is possible that future price volatility may cause a temporary mismatch between upside/downside for a stock based on market price and the formal recommendation.

\* In most cases, the target price will equal the analyst's assessment of the current fair value of the stock. However, if the analyst doesn't think the market will reassess the stock over the specified time horizon due to a lack of events or catalysts, then the target price may differ from fair value. In most cases, therefore, our recommendation is an assessment of the mismatch between current market price and our assessment of current fair value.

## Industry Recommendations

**Overweight.** The analyst expects the fundamental conditions of the sector to be positive over the next 12 months.

**Neutral.** The analyst expects the fundamental conditions of the sector to be maintained over the next 12 months.

**Underweight.** The analyst expects the fundamental conditions of the sector to be negative over the next 12 months.

## Country (Strategy) Recommendations

**Overweight (O).** Over the next 12 months, the analyst expects the market to score positively on two or more of the criteria used to determine market recommendations: index returns relative to the regional benchmark, index sharpe ratio relative to the regional benchmark and index returns relative to the market cost of equity.

**Neutral (N).** Over the next 12 months, the analyst expects the market to score positively on one of the criteria used to determine market recommendations: index returns relative to the regional benchmark, index sharpe ratio relative to the regional benchmark and index returns relative to the market cost of equity.

**Underweight (U).** Over the next 12 months, the analyst does not expect the market to score positively on any of the criteria used to determine market recommendations: index returns relative to the regional benchmark, index sharpe ratio relative to the regional benchmark and index returns relative to the market cost of equity.