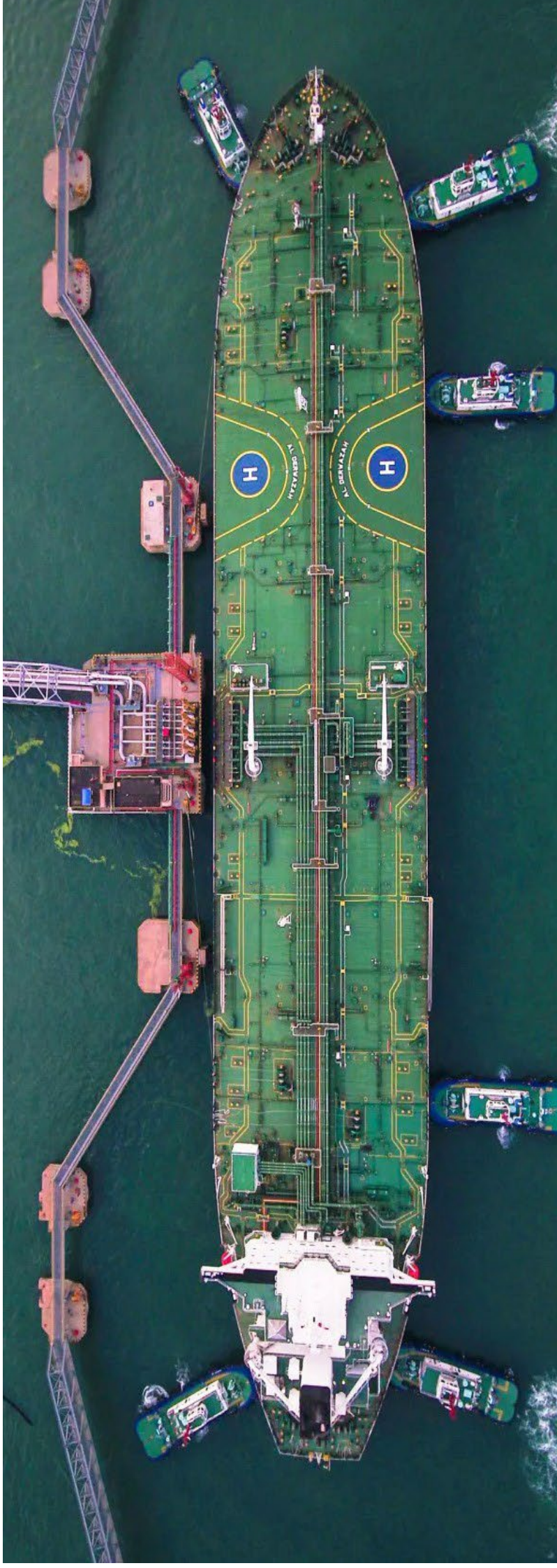
APERC
Oil Report
2024



APERC
Asia Pacific Energy Research Centre

Published by:

Asia Pacific Energy Research Centre (APERC)
Inui Building, Kachidoki 11F,
1-13-1 Kachidoki,
Chuo-ku,
Tokyo, 104-0054 Japan

Tel : (813) 5144-8551
Fax : (813) 5144-8555
E-mail : master@aperc.or.jp (administration)
Website : https://aperc.or.jp/

Cover photo : The Guardian (2019)

Contents

Foreword

The APERC Oil Report 2024 describes recent changes and expected near-term developments in APEC and global oil markets. The report looks back 22 years and forward 8 years to examine changes in oil demand, production, trade, price movements, and refining.

Global and APEC-wide oil demands have now returned to pre-pandemic levels, signalling that oil remains an essential commodity in powering industries and transportation at this moment, despite major decarbonization efforts by governments and industries. However, due to these efforts, future oil demand remains uncertain as oil demand will likely continue to grow in some economies while it declines in others. Similarly, future oil production changes will vary by economy causing changes in trade flows and import dependence.

Uncertainties about the pace of the energy transition have increased the risks associated with oil industry investments, including exploration, development, and refining. These and other uncertainties will likely contribute to continued oil price volatility.

We hope the APERC Oil Report 2024 will provide policymakers across APEC with useful information on recent developments and the near-term outlook for oil markets and assist in their efforts to improve the sustainability, security, and affordability of their economies' energy systems. This oil report is part of the APERC fossil fuel reports series, which are published annually.

I would like to express my sincere gratitude to the authors and contributors for their time and effort in writing and publishing this report. I am also grateful to APEC member economies for providing updated data through the APEC Expert Group on Energy Data and Analysis (EGEDA).

Dr. Kazutomo IRIE
President
Asia Pacific Energy Research Centre
May 2025

Acknowledgements

We are grateful for the full support and insightful advice of Mr. Glen E. Sweetnam, Senior Vice President of APERC, and Mr. Munehisa Yamashiro, Vice President of APERC. We also wish to thank the administrative staff of APERC as this study could not have been completed without their assistance.

Authors

Nabih MATUSSIN
Thanan MARUKATAT

Editors

Glen E. SWEETNAM
Munehisa YAMASHIRO

Design

Nabih MATUSSIN

Abbreviations and acronyms

Abbreviations

b/d	barrels per day
kb/d	thousand barrels per day
mb/d	million barrels per day

Acronyms

APEC	Asia-Pacific Economic Cooperation
APERC	Asia Pacific Energy Research Centre
CER	Canada Energy Regulator
CIS	Commonwealth of Independent States
EGEDA	Expert Group on Energy Data and Analysis
EI	Energy Institute
EV	Electric Vehicle
EIA	Energy Information Administration
EU	European Union
IEA	International Energy Agency
ICE	Internal Combustion Engine
NGL	Natural Gas Liquid
OECD	Organization for Economic Cooperation and Development
OPEC	Organization of the Petroleum Exporting Countries
WTI	West Texas Intermediate
USD	United States Dollar

APEC regional groupings

China (PRC)	
Northeast Asia (NEA)	Hong Kong, China; Japan; Korea; Chinese Taipei
Oceania (OCE)	Australia; New Zealand; Papua New Guinea
Other Americas (OAM)	Canada; Chile; Mexico; Peru
Russia (RUS)	
Southeast Asia (SEA)	Brunei Darussalam; Indonesia; Malaysia; the Philippines; Singapore; Thailand; Viet Nam
United States (US)	

List of figures

Summary and key trends

Demand

- Global oil demand in 2023 was 102.3 million barrels per day (mb/d) which was an increase of 22.8 mb/d from the level in 2000. Transport and non-energy sectors were the dominant users of oil, accounting for 53% and 18% of the global oil demand, respectively in 2022. The global economic slowdown from 2022 to 2023 caused a deceleration of global oil demand growth. Global oil demand grew by only 2.59 mb/d from 2022 to 2023, compared to a substantial increase of 5.3 mb/d between 2020 to 2021.

- OECD-wide oil demand declined marginally by 37 thousand barrels per day (kb/d) between 2022 and 2023, with OECD Europe contributing largely to the drop. Conversely, non-OECD oil demand expanded significantly by 2.45 mb/d in the same year, led by growth in China, India and Southeast Asia.

- APEC oil demand increased substantially by 1.95 mb/d between 2022 and 2023, with China reaching a record-high 16.1 mb/d in 2023. Marginal growth was recorded in other APEC subregions.

- China's oil demand is projected to reach over 18 mb/d in 2030, according to IEA and OPEC. Despite the dominance of electric vehicles (EV) in new vehicle purchases, the continued growth of internal combustion engine (ICE) vehicles plus growth in aviation, petrochemicals and other demand sectors, means that the China oil demand is expected to continue to grow.

Supply

- Global oil production (crude oil and NGLs) rose to an all-time high of 95.9 mb/d in 2023, with APEC and OPEC members contributing 45% and 40% of the global production, respectively.

- APEC oil production reached 43.1mb/d in 2023, driven largely by record-high output in the United States and Other Americas. Russia and Southeast Asia experienced marginal declines between 2022 and 2023.

- The United States' crude oil and NGLs production surpassed 18 mb/d in 2023. Likewise, Canada's crude production reached an all-time high of 5.9 mb/d in the same year. Mexico and China also increased their domestic crude oil production. In contrast, production in Southeast Asia continued to decline due to maturing oilfields and a lack of new discoveries.

- Over the medium term, the United States and Canada are expected to grow their tight oil and oil sands production, respectively by 2030.

Trade movements

- APEC exports of crude oil and NGLs rose by 74% between 2000 and 2022. This was driven largely by a switch from substantial net oil imports to moderate net oil exports from the United States. APEC imports also increased by 16% during the same period, contributed mainly by significant imports into China.

- China and India were the two main buyers of Russian crude in Asia in 2023, as Russia rerouted its crude and petroleum products to Asia due to reduced Russian oil exports to Europe.

- China imported a record amount of crude oil in 2023 at 11 mb/d to support the economy's increasing refining capacity for its growing transportation requirements and increasing petrochemical production.

- Over the next 20 years, as maturing fields and lack of new discoveries continue to drive down crude oil production, Southeast Asia will need to import larger volumes of crude oil than ever before, and that import dependency could reach between 70% and 80% in the 2040s.

Refining

- Global refining capacity stood at all-time high of 103.5 mb/d in 2023, with net new capacity additions of 2.10 mb/d.

- APEC refineries exhibited robust growth, with crude oil intakes reaching record volumes and yearly growth and increasing capacity utilization levels exceeding pre-COVID-19 levels.

- APEC refinery outputs in 2022 did not reach pre-COVID-19 level but outputs in 2023 are likely to exhibit highest growth.

- Refinery output yield ratios of APEC refineries, in particular gasoline and diesel, were undergoing significant changes in the past 15 years because of new capacity additions and changes in fuel mixes in the transport sector.

Price movements

- Brent crude oil averaged USD 80.52 per barrel in 2024, down by almost USD 2 per barrel from the previous year – mostly due to slowing global economic growth, concerns over sluggish oil demand in China's transport sector, and adequate global oil supplies.

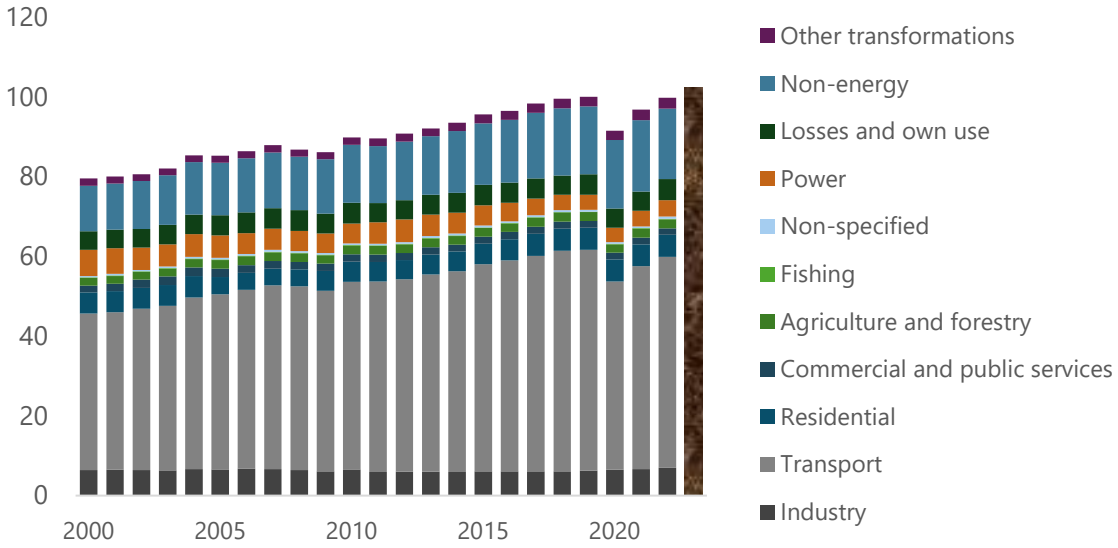
- The average Gulf Coast crack spreads for gasoline and diesel in 2024 were generally lower than in 2023 due to sluggish domestic demand for gasoline and rising inventories as well as increased refining capacity. Likewise, declining manufacturing activity has also narrowed the diesel crack spread.

Chapter 1. Demand

Global oil demand hits fresh highs in 2023

Global oil demand (excluding biofuels) has increased by 22.8 mb/d over the past 23 years, amounting to 102.3 mb/d in 2023. Transport and non-energy sectors remained the top two oil-consuming sectors, accounting for about 53% (equivalent to 52.9 mb/d) and 18% (17.6 mb/d) of the global oil demand respectively in 2022 (Figure 1-1).

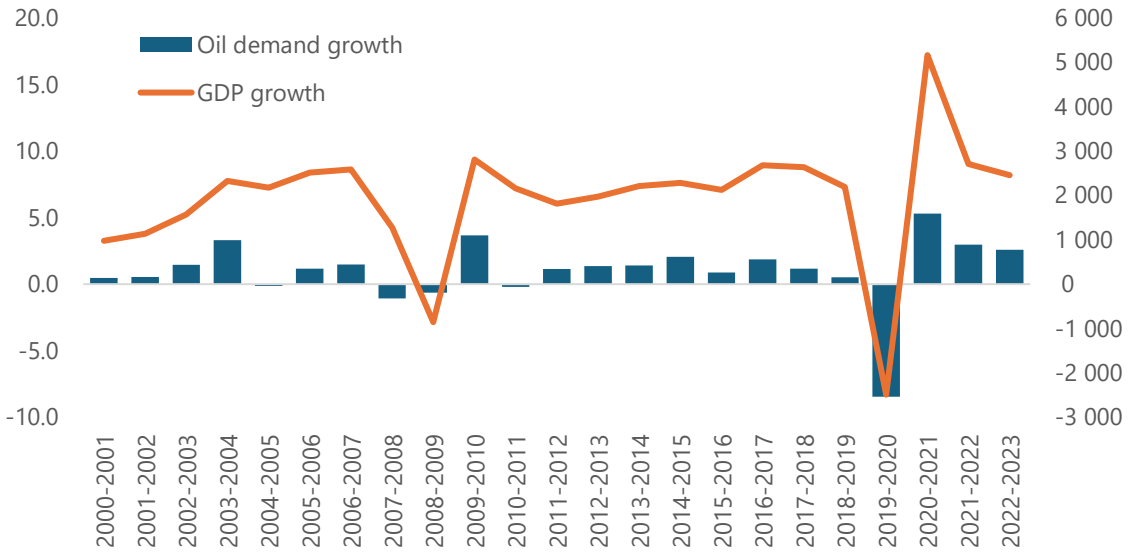
Figure 1-1: Global oil demand by sector, 2000 - 2023 (mb/d)



Source: EI (2024), IEA (2024)

Despite the global oil demand reaching new heights in 2023, the post-COVID19 demand growth rate has appeared to slow down, from the significant increase of 5.3 mb/d between 2020 and 2021 to just 2.59 mb/d between 2022 and 2023. This reflects challenges in the global economy, as its GDP grew by only USD 2 450 billion (2.7% growth) between 2022 and 2023 compared to over USD 5 100 billion growth (6.3%) between 2020 and 2021 (Figure 1-2), driven by interest rate hikes in response to inflation.

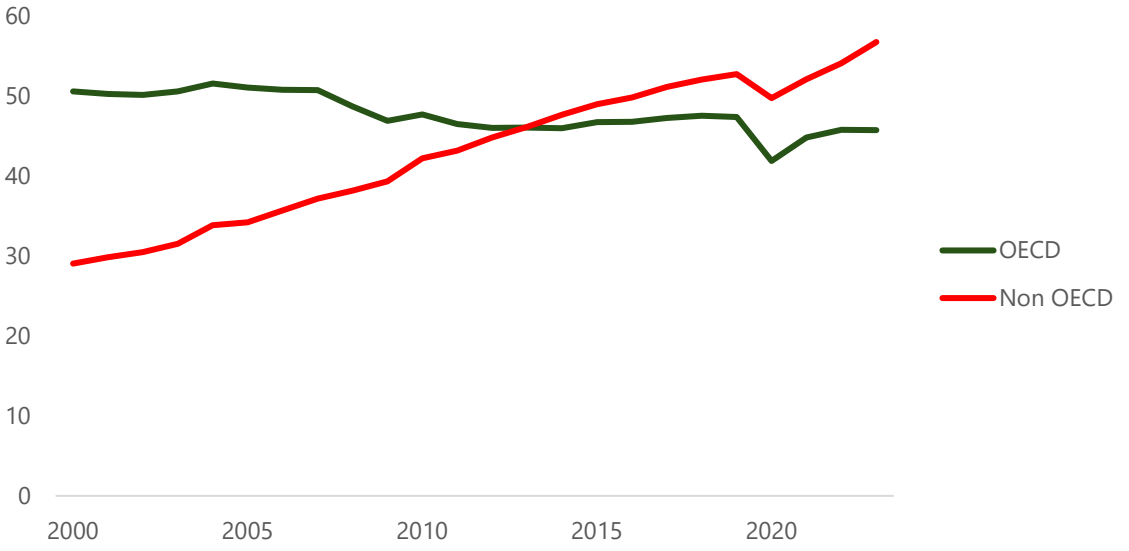
Figure 1-2: Growths in global oil demand (left – mb/d) and world GDP (right – billion GDP), 2000 - 2023



Source: EI (2024), IEA (2024), World Bank (2024)

In terms of regions, OECD's oil demand continued to decline marginally by over 36.5 thousand barrels per day (kb/d) in 2023 from 2022 levels, with OECD Europe contributing largely to the decrease despite a positive marginal growth in United States' oil demand. In contrast, the non-OECD oil demand still expanded substantially by 2.45 mb/d in the same year, driven by growths in China, India and several Southeast Asia economies (Figure 1-3).

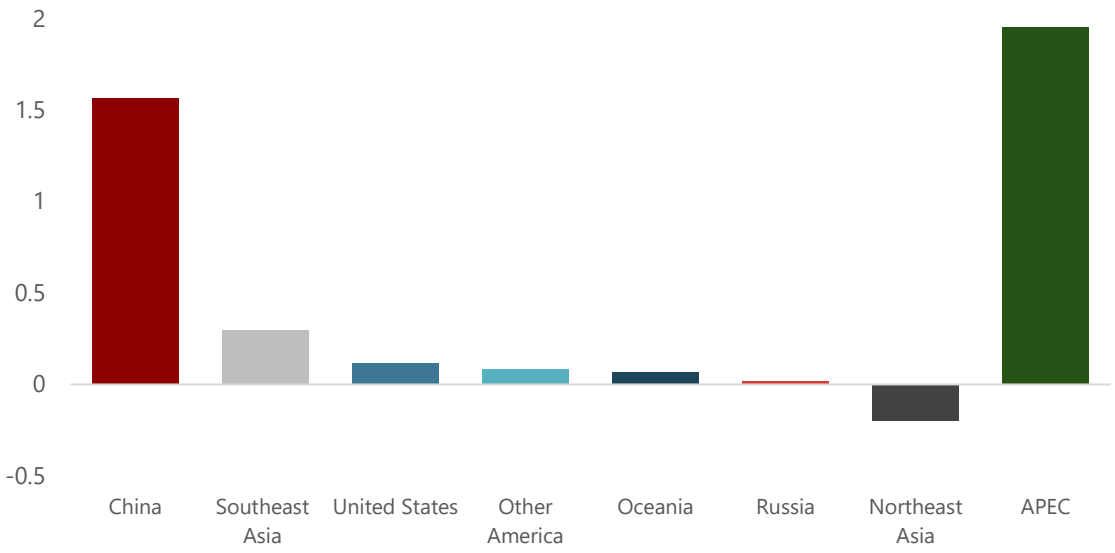
Figure 1-3: OECD and non-OECD oil demand, 2000 – 2023 (mb/d)



Source: EI (2024)

China's demand growth surpassed the 1 mb/d mark for the first time

Figure 1-4: Annual growth in APEC oil demand, 2022 – 2023 (mb/d)



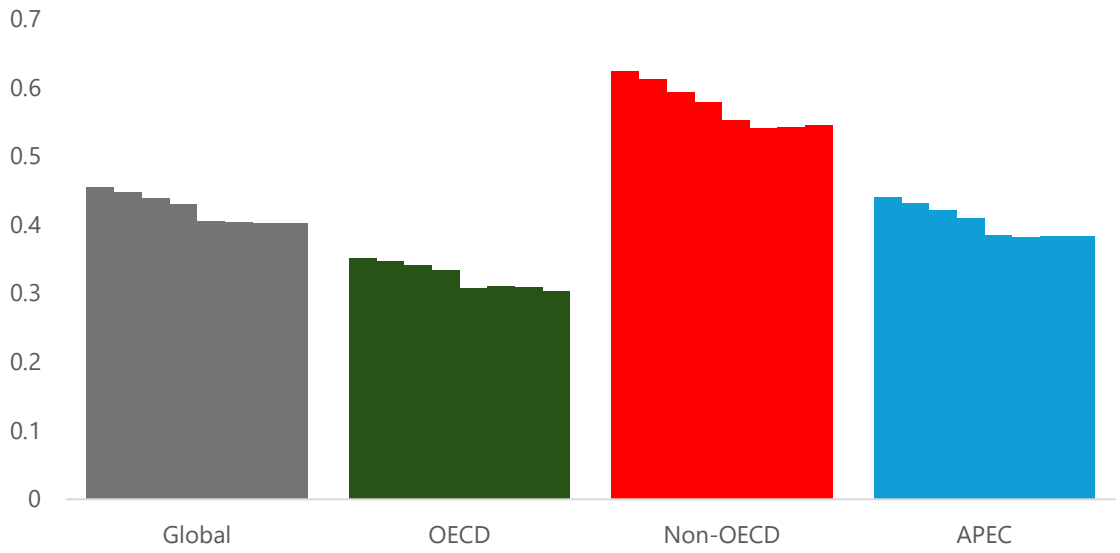
Source: EGEDA (2024), EI (2024)

APEC's oil demand increased by 1.95 mb/d in 2023, with about four-fifths of the increase coming from China alone. China's oil demand in 2023 amounted to a record-high 16.1 mb/d, reflecting a robust rebound in demand due to a relaxation of the economy's zero COVID-19 measures. Oil demand in the rest of the APEC regions (except northeast Asia) only grew marginally, ranging from 0.02 mb/d to 0.29 mb/d, while northeast Asia's demand declined by 0.19 mb/d between the same period (Figure 1-4).

Growth in southeast Asia oil demand was driven by Singapore, which recorded the highest oil demand growth of about 156 kb/d between 2022 and 2023, followed by Viet Nam and Malaysia at 72 and 40 kb/d, respectively.

Global oil intensity changed course post-COVID-19 era

Figure 1-5: Global oil intensity by region, 2016 – 2023 (bbl/thousand USD)



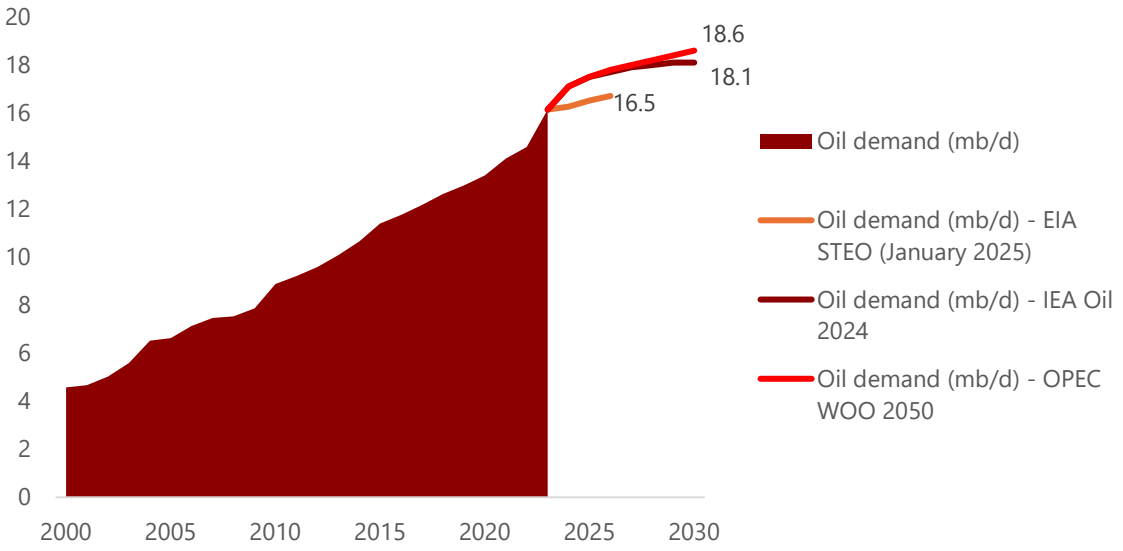
Source: EGEDA (2024), EI (2024), World Bank (2024)

Global oil intensity, which is defined as the amount of oil required to grow one unit of GDP, had been on a declining trend. For instance, the global oil intensity decreased from 0.45 in 2016 to 0.40 barrels per USD1000 GDP in 2020. A similar pattern is also noticeable in OECD, non-OECD and APEC regions, albeit at different magnitudes (Figure 1-5). Most of the reduction could be attributed to the increased efficiency of end-use technologies, particularly in the transport sector in which there are continuous improvements in the fuel economy of internal combustion engine (ICE) vehicles, as well as a shift to electric vehicles. Furthermore, oil is no longer being a significant source of fuel for power generation due to higher preference for other fuels (coal, gas, renewables, etc).

The post-COVID-19 era saw the global oil intensity stabilising, as global GDP and global oil demand grew at the same pace between 2021 and 2023. While OECD oil intensity declined marginally, non-OECD and APEC oil intensities saw a slight uptick, as the growth rates of oil demand in those regions surpassed those of GDP between the same period. China was the primary driving force behind the increase in non-OECD and APEC oil intensities, as its oil demand grew substantially by 7% compared to a 4% growth in its GDP between 2021 and 2023. The faster growth of China's oil demand relative to its GDP growth was due to a confluence of factors, one of which China's petrochemical sector was the key factor. Significant expansion of petrochemical capacity in 2023 drove China's share to 60% of the global increase in petrochemical capacity, as the economy prioritises domestic production of petrochemicals for plastics and chemicals manufacturing.

The outlook for China oil demand remains uncertain

Figure 1-6: China oil demand outlook, 2000 - 2030 (mb/d)



Source: EGEDA (2024), EIA (2025), OPEC (2024), IEA (2024)

China's oil demand is expected to continue increasing over the medium term, according to OPEC IEA and EIA. The latest report by OPEC forecasts China's demand to reach 18.6 mb/d by 2030, driven by continued growth in the number of internal combustion engines (ICE) vehicles, particularly those within the commercial sector, despite substantial growth in the number of electric vehicles (EVs). Furthermore, oil demand growth is also supported by continued expansion of the petrochemical industry, which has traditionally been naphtha-based, as well as aviation, residential and agriculture sectors. In contrast, IEA expects China's oil demand to achieve just over 18.1 mb/d in 2030, given growing reliance on electric vehicles.

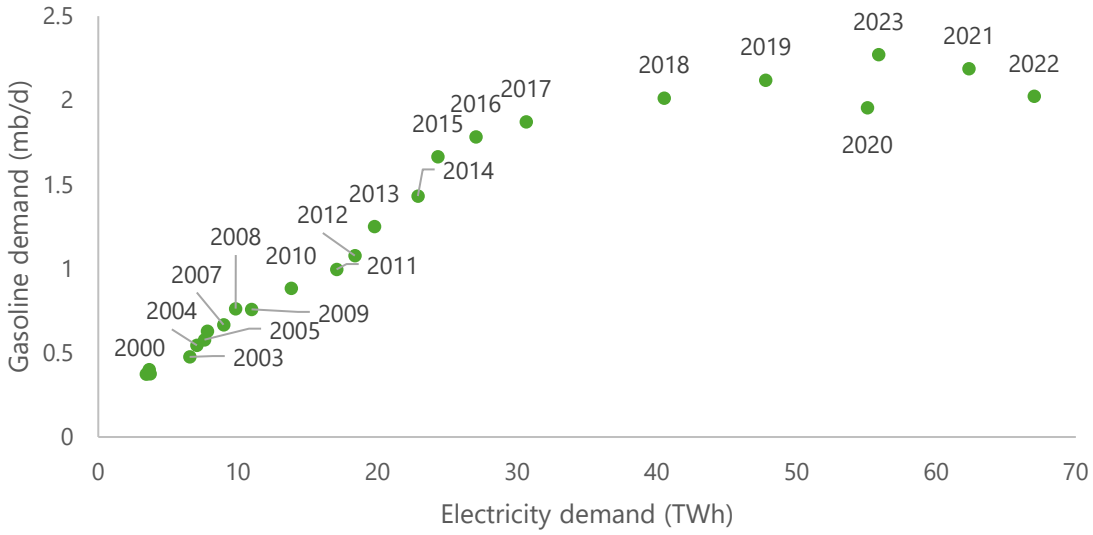
There are signs of limiting gasoline demand in China, amid rise in electric vehicles.

China's electric vehicles development has been on the ground since the implementation of the New Energy Vehicle (NEV) programme in 2009, which aimed at stimulating the development of battery electric vehicles, plug-in hybrid electric vehicles, and fuel cell electric vehicles. Since then, the market for electric vehicles has gained traction as the government emphasised their importance to achieve healthy air quality. As of the end of 2023, China sold over 8.1 million units of electric vehicles, which was a substantial 35% increase from 2022 levels.

As shown in Figure 1-7, increased reliance on electric vehicles appears to be reducing the growth of gasoline consumption, especially after 2015 when the sales of electric vehicles surpassed 240 000 units per year, which was a five-fold increase from the previous year. The remarkable annual growth of 10 percent per year between 2015 and 2023 in electricity demand of electric vehicles contrasted with the slow annual gasoline growth of just 4% during the same period. However, the analysis does not factor in the effect of economic and population growth,

given that gasoline demand correlates with those factors. Also, it remains to be seen if continued increase in electricity demand in the future would further dent gasoline demand.

Figure 1-7: Gasoline demand (mb/d) (y-axis) vs electricity demand (TWh) (x-axis) in China road transport, 2000 -2023



Source: EGEDA (2024), IEA (2024), EI (2024)

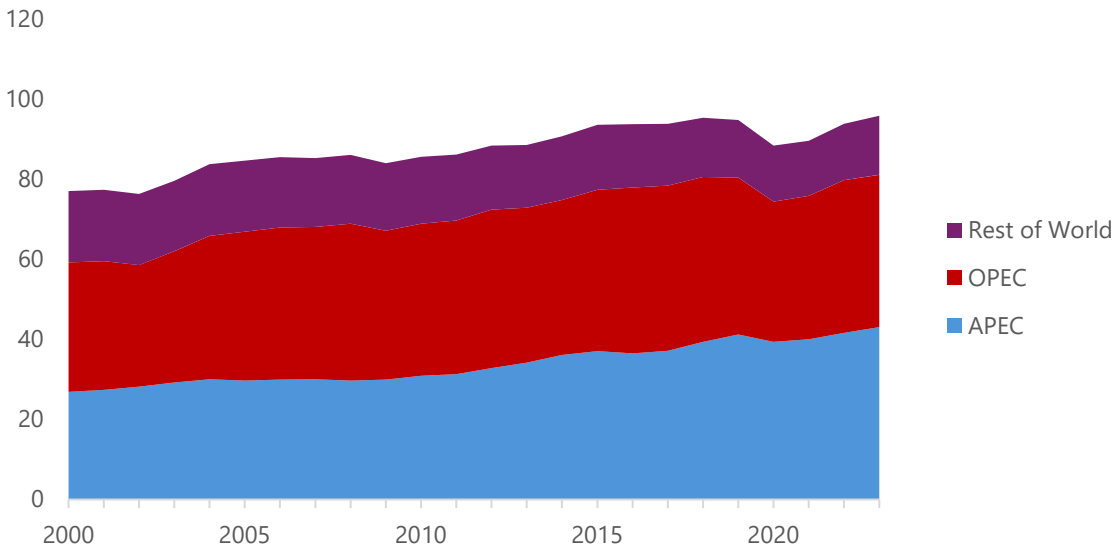
Chapter 2. Supply

APEC led the global oil production growth in 2023

Global oil (crude oil and natural gas liquids) production grew by 2.1 mb/d in 2023 to reach an all-time high of 95.9 mb/d (Figure 2-1). Of this, APEC oil production increased the most by 1.4 mb/d, driven by growth in the United States. On the contrary, OPEC output dropped by 0.13 mb/d, which is largely driven by production cuts in Saudi Arabia and the rest of the OPEC members that were intended to balance the market amid increased production from non-OPEC members. Production from the rest of the world (non-APEC and non-OPEC members) grew by 0.74 mb/d, driven by record-high outputs in Argentina and Brazil.

Of the global oil production in 2023, APEC contributed about 45%, while OPEC members contributed 40%, led by Saudi Arabia and Iran which produced 11.4 mb/d and 4.7 mb/d respectively. Rest of the world (non-APEC and non-OPEC members) accounted for the remainder of the shares (14%).

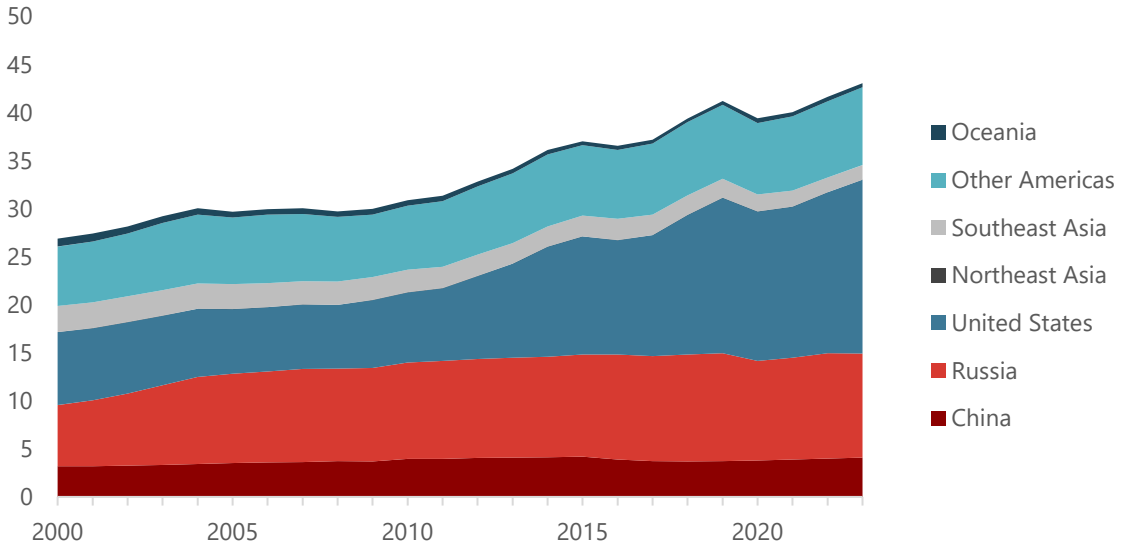
Figure 2-1: World oil production, 2000 – 2023 (mb/d)



Source: EGEDA (2024), EI (2024)
Note: Oil comprises crude oil and natural gas liquids (NGLs)

APEC production in 2023 reached 43.1 mb/d, up from 41.6 mb/d in 2022 (Figure 2-2). This was largely contributed to record high outputs in the United States and Other Americas at 18.1 mb/d and 8.1 mb/d, respectively. Russian oil output declined by 0.13 mb/d, likewise that of Southeast Asia had only a marginal decline compared to the declines in the previous years, driven by the growth in Malaysia's oil production.

Figure 2-2: APEC oil production by subregion, 2000 - 2023 (mb/d)



Source: EGEDA (2024), EI (2024)

United States produced more oil than any economy ever

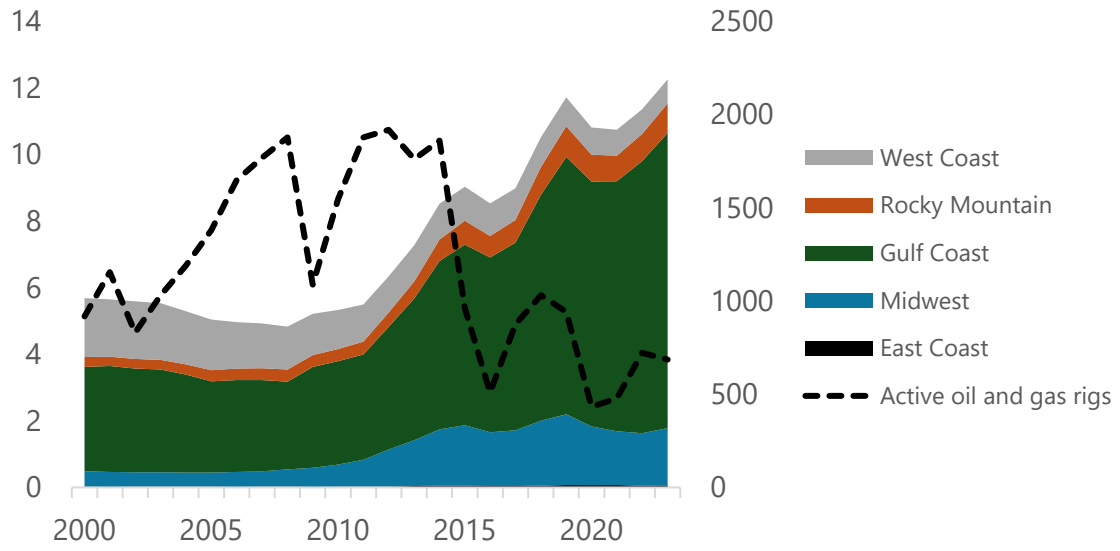
The United States' oil production surpassed an 18 mb/d-mark in 2023, setting a record for the highest production level by any economy. Of this, crude oil production reached 12.3 mb/d and natural gas liquids (NGLs) also registered an all-time high of 5.8 mb/d in 2023.

The Gulf Coast, home to the states of Texas and New Mexico, in which the Permian Basin is located, continued to be the leading crude oil producer in the United States, accounting for over 72% (or 8.9 mb/d) of the total crude output in 2023. The Midwest yielded 1.7 mb/d, equivalent to over 14% of the total crude oil output, driven by significant contribution by North Dakota, owing to the adoption of horizontal drilling and hydraulic fracturing in the Bakken-Three Forks formation.

Figure 2-3: The Permian Basin

The significant rise in United States oil production can also be attributed to technological advancements in drilling methods, which yield efficiency gains with respect to the number of active rigs. Since 2014, the number of active rigs has fallen by about 69%, as more efficient new wells do not require a greater number of rigs (Figure 2-4).

Figure 2-4: Crude oil production in the United States by district (mb/d) (left) and number of active oil and gas rigs (right), 2000 - 2023



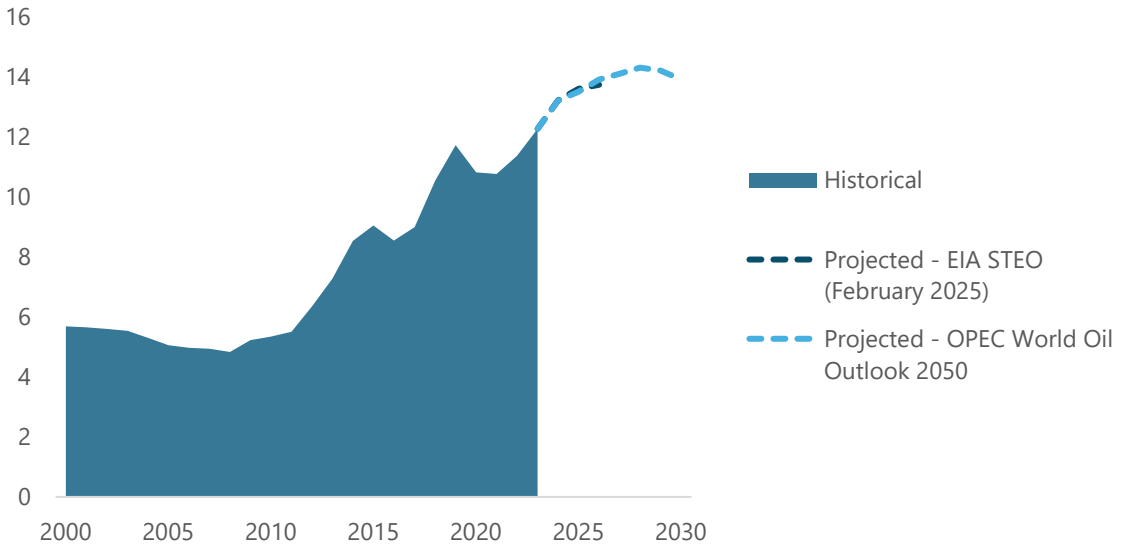
Source: US EIA (2024)

Tight oil remains a key contributor to United States' future crude production

The United States is expected to remain the largest producer within APEC and non-OPEC platforms. According to OPEC, crude oil production is expected to grow and peak in 2029 at 14.2 mb/d, before declining to 13.9 mb/d in the subsequent year due to natural decline. The projected crude oil production in the EIA's latest Short Term Energy Outlook seems to be aligned with the OPEC's projection, though the former is only until 2026 (Figure 2-5).

The growth in the economy's crude oil production is driven significantly by tight oil, of which the output is dominated by the Permian basin. The tight oil output from the Eagle Ford in Texas is also expected to increase, while production from Bakken, Niobrara and other basins are expected to stabilise. Over the medium term, the crude output from the Gulf of Mexico is expected to stabilise at 1.9 mb/d. A few new fields are projected to come on stream that will help offset a decline in existing assets. These include the 80 kb/d Anchor and Whale fields, Shenandoah (40 kb/d) and Shenzi North (25 kb/d) fields, Ballymore field (75 kb/d), Kaskida field (100 kb/d), and Sparta and Tiber (each 80 kb/d).

Figure 2-5: United States crude oil production outlook, 2000 - 2030 (mb/d)

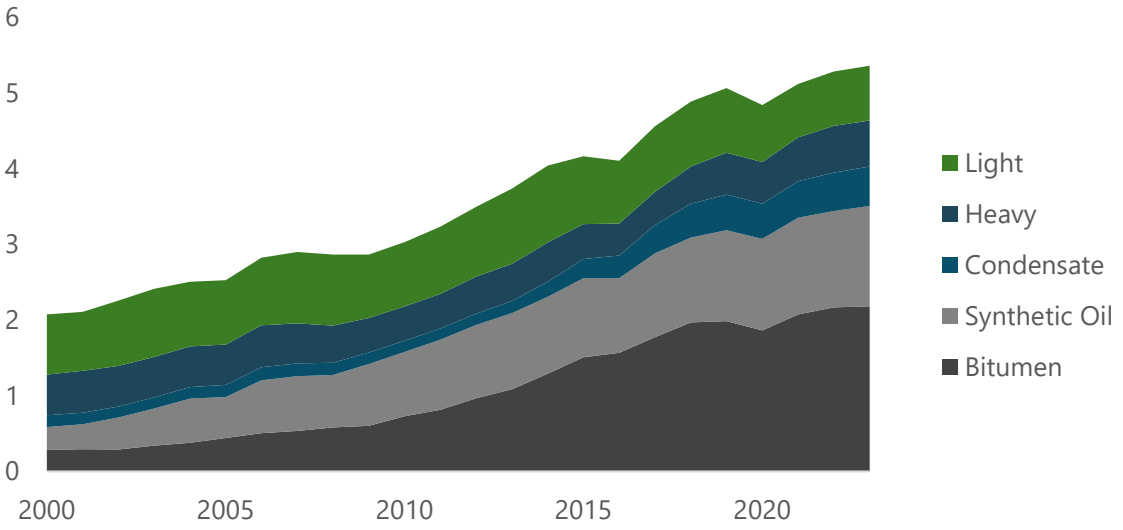


Source: EGEDA (2024), EIA (2025), OPEC (2024)

Slower growth of crude oil production in Canada

Canada's total oil output rose to a record high 5.9 mb/d in 2023, up by 1.4% relative to 2022 levels, as synthetic oil was the main contributor to the overall growth (Figure 2-6). Oil sands contributed to over 65% of Canada's overall oil output, with almost two-fifths of the oil sands upgraded to synthetic oil. Alberta is home to over 80% of Canada's oil production, thanks to significant volumes of bitumen in three major oil sands areas: Athabasca, Cold Lake, and Peace River.

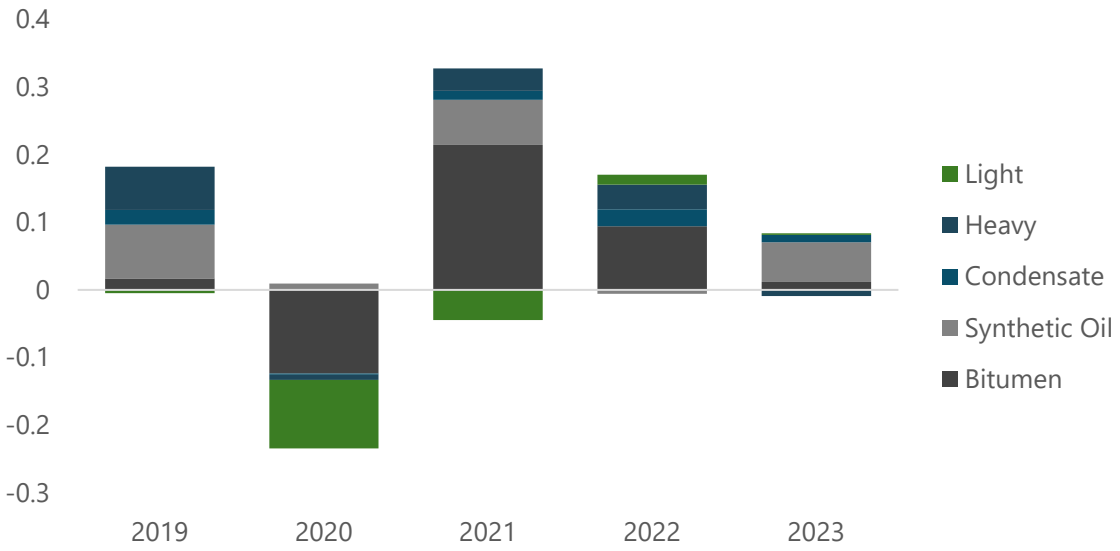
Figure 2-6: Crude oil production in Canada by type, 2000 – 2023 (mb/d)



Source: EGEDA (2024), CER (2024)

Between 2019 and 2023, Canada's crude oil output experienced a fluctuating growth rate (Figure 2-7). After a growth of 3.6% in 2019, production dipped by 4.5% due to COVID-19 pandemic in 2020. Following economic recovery and a rebound in demand post COVID-19, production increased substantially by almost 6% in 2021, of which bitumen contributed the most. Growth rates in 2022 and 2023 were at 3.2% and 1.4%, respectively, due to limitation in transporting Canada's crude oil beyond domestic refining markets.

Figure 2-7: Annual change of crude oil production in Canada by type, 2019 - 2023



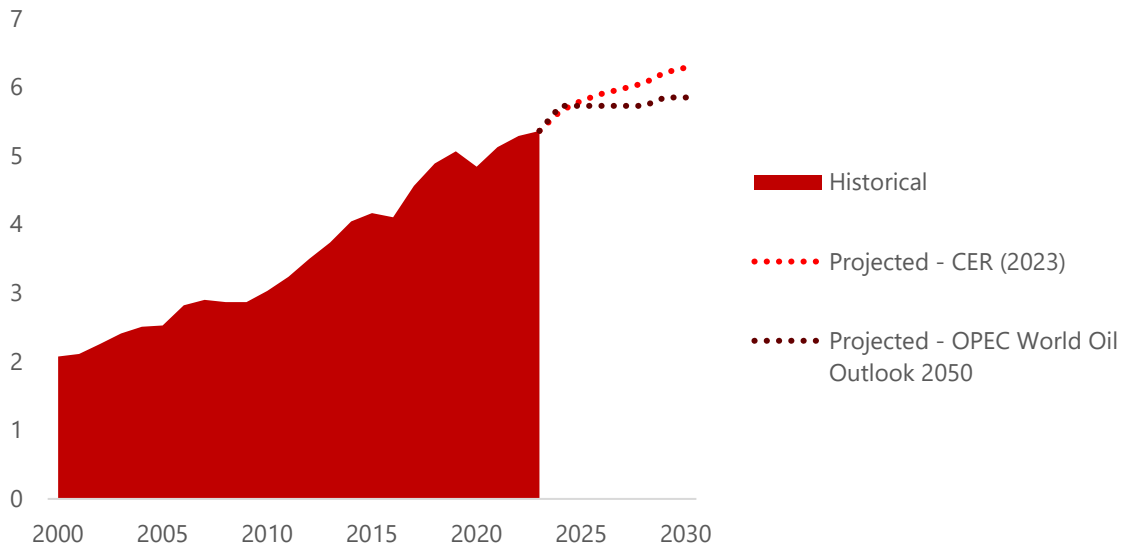
Source: EGEDA (2024), CER (2024)

Oil sands will remain an important part of Canada's oil industry

Canada's overall production is projected to continue growing and eventually reaching between 5.8 and 6.2 mb/d in 2030 (Figure 2-8). Oil sands remain dominant compared to conventional crude and tight oil, underscoring its importance in supporting Canada's economy.

The completion of the expansion of Trans Mountain Pipeline (TMX) scheduled in 2024 could enable Canada to loosen its distribution bottlenecks that limited crude transportation. The pipeline has been undergoing work to expand the existing capacity from 300 kb/d to 900 kb/d, which will boost crude oil production from Alberta for export to the West Coast and on to United States or Asian refiners, particularly in China.

Figure 2-8: Canada crude oil production outlook, 2000 - 2030 (mb/d)

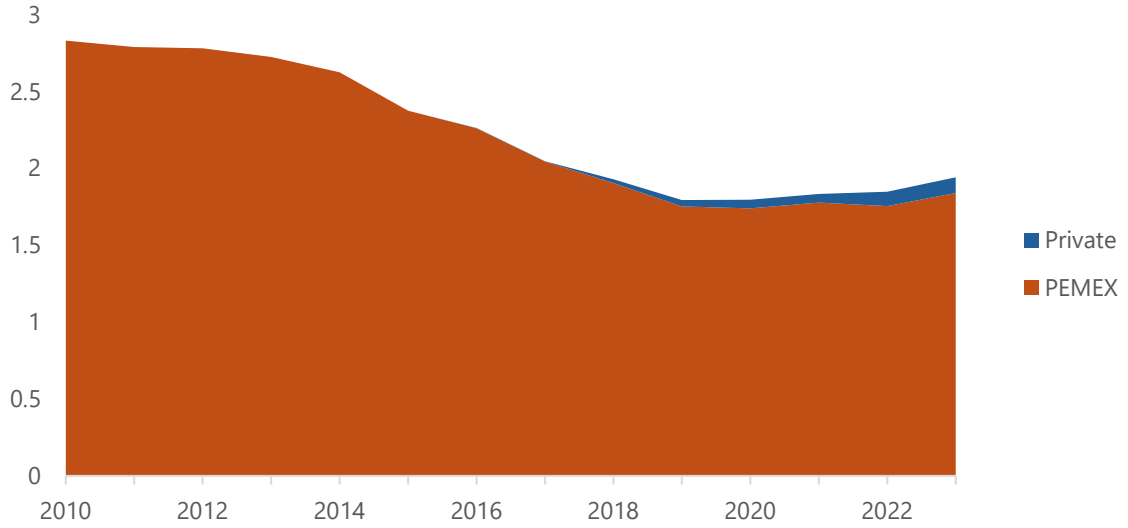


Source: EGEDA (2024), CER (2023), OPEC (2024)

Mexico crude oil output continued to progress

Mexico's crude oil production continued to increase, reaching 1.94 mb/d in 2023, which is growth of over 5% from 2022 levels (Figure 2-9). Production by the state-owned Petróleos Mexicanos (Pemex) increased by about 84 kb/d, while that by private operators jumped by 8.8 kb/d between 2022 and 2023. The increase in overall output in 2023 was largely attributable to the growth of onshore production, offsetting the decline in shallow-water output.

Figure 2-9: Crude oil production in Mexico by operator, 2010 - 2023 (mb/d)



Source: EGEDA (2024), CNH (2024)

The two main players, Eni Mexico and Hokchi Energy, contributed largely to the yearly boost in production from the private operators, although Petrofac Mexico and Fieldwood Energy

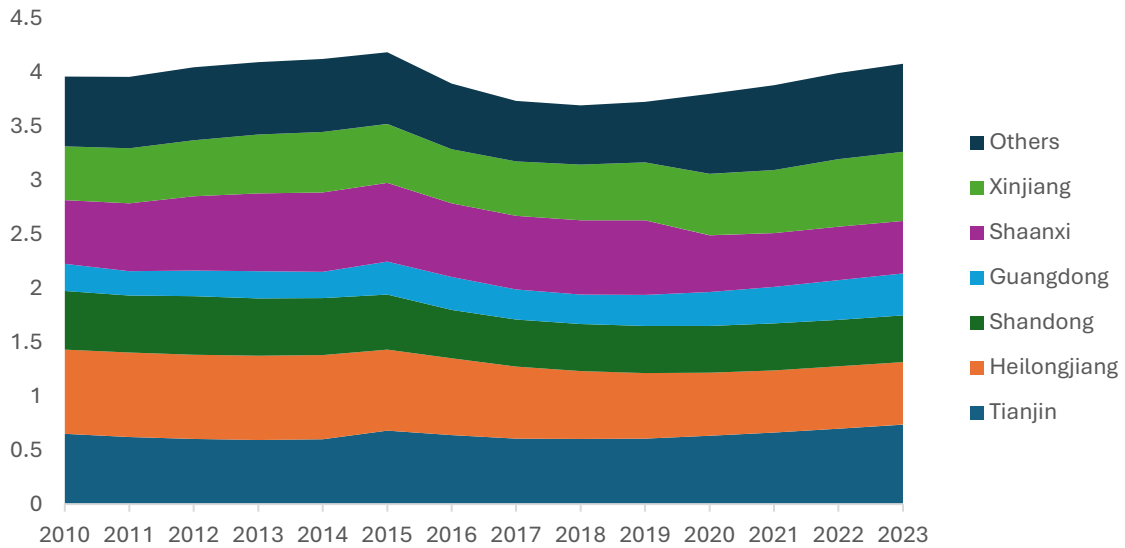
E&P Mexico recorded significant declines. In addition, Perenco Mexico has significantly increased its oil production in 2023, following successful drilling of six new wells since it first entered Mexico in 2018.

China crude output continued to climb in 2023

China's domestic crude oil output reached its peak in 2015, when the economy produced over 4.3 mb/d, after which it declined steadily until 2018 to 3.8 mb/d (Figure 2-10). One of the main reasons was the aging of China's major fields, including the Daqing field in Heilongjiang province, which had long been the economy's most important source of crude. Its output fell by over 124 000 b/d between 2015 and 2016 – the largest fall among all fields.

Given significant efforts carried out by China National Petroleum Corp. (CNPC), China Petroleum & Chemical Corp. (Sinopec) and CNOOC Ltd, China was able to reverse its production decline. Between 2018 and 2023, production grew by 0.38 mb/d, contributed by increase in output from Bohai offshore oilfield in Tianjin and oilfields in Guangdong. In addition, the Bayan onshore oilfield in the Hetao basin in Inner Mongolia achieved a daily high crude output of over 4 300 tonnes in 2023, embarking on an annual crude output of 1 million tonnes. The recent discovery of Kaiping South oilfield in deepwater South China Sea, which was tested to produce an average of 7 680 b/d of crude oil, will give added impetus to the domestic growth of China's crude oil production.

Figure 2-10: Crude oil production in China by province, 2010 - 2023 (mb/d)

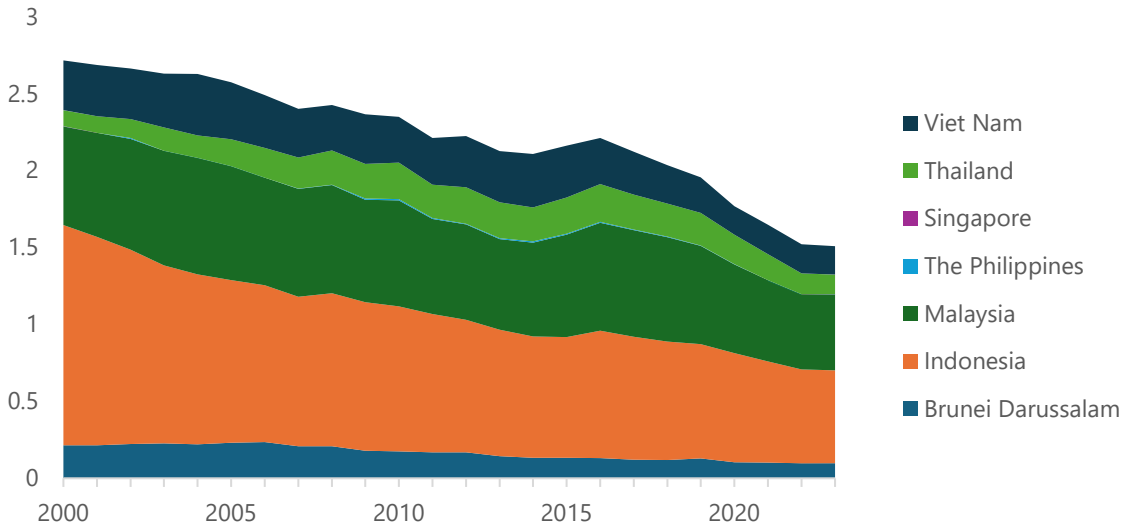


Source: EGEDA (2024), NBS (2024)

In addition, China is exploring opportunities in investments in African oil-rich economies such as Angola and Uganda. CNOOC has held bilateral meetings with the Angolan counterparts to discuss possible exploration opportunities around Block 24, which is in the Southern Kwanza Basin, as Angola aims to produce about 1.18 mb/d of crude.

Lack of discoveries and maturing fields driving down production in Southeast Asia

Figure 2-11: Southeast Asia oil production, 2000 - 2023 (mb/d)



Source: EGEDA (2024), EI (2024)

Southeast Asia has been experiencing production declines over the past twenty years, with regional production falling by over 1.2 mb/d between 2000 and 2023 (Figure 2-11). Between 2022 and 2023, however, production only declined marginally compared to declines in the previous years, as outputs in Brunei Darussalam and Malaysia recorded increases of 0.17 kb/d and 5.24 kb/d, respectively.

In general, the persistent decline of Southeast Asia's oil production is driven by maturing shallow oilfields and lack of new discoveries, particularly in the deepwater areas. Indonesia, the largest producer in the region, has proven reserves of 2.36 billion barrels, and yet only 20 basins have been exploited out of a total of 128 basins. Nevertheless, the government continues to encourage operators to accelerate oil and gas production to achieve the 1 mb/d target by 2030, which would require a total investment of USD 20 billion per annum.

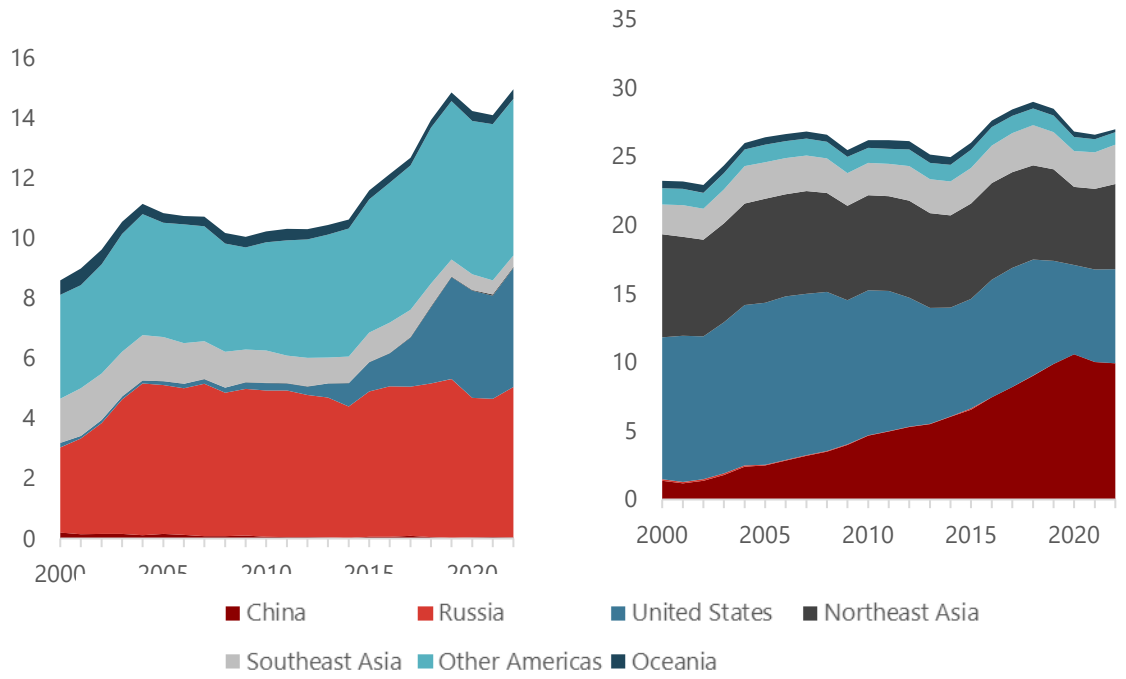
Chapter 3. Trade movements

Crude oil and NGLs

Crude oil and NGLs export rose by 74% over the past 22 years, growing from 8.6 mb/d in 2000 to almost 15 mb/d in 2022. Much of the growth was primarily attributable to the substantial increase of more than 26 times in exports of United States crude over the similar period, and therefore its share with respect to APEC's total crude oil export rose from just 2% in 2000 to 26% in 2022. Southeast Asia experienced the largest drop in crude oil export, given its substantial decline in production over the past 22 years.

On the other hand, import of crude oil and NGLs increased by 16% over the same period. China imported over 7 times more crude oil in 2022 than the level in 2000, making it the largest importer in APEC and in the world. Inflow of crude to the United States has declined significantly, given its substantial development in domestic tight oil production. Southeast Asia's import rose by 33% to compensate for the loss of domestic production (Figure 3-1).

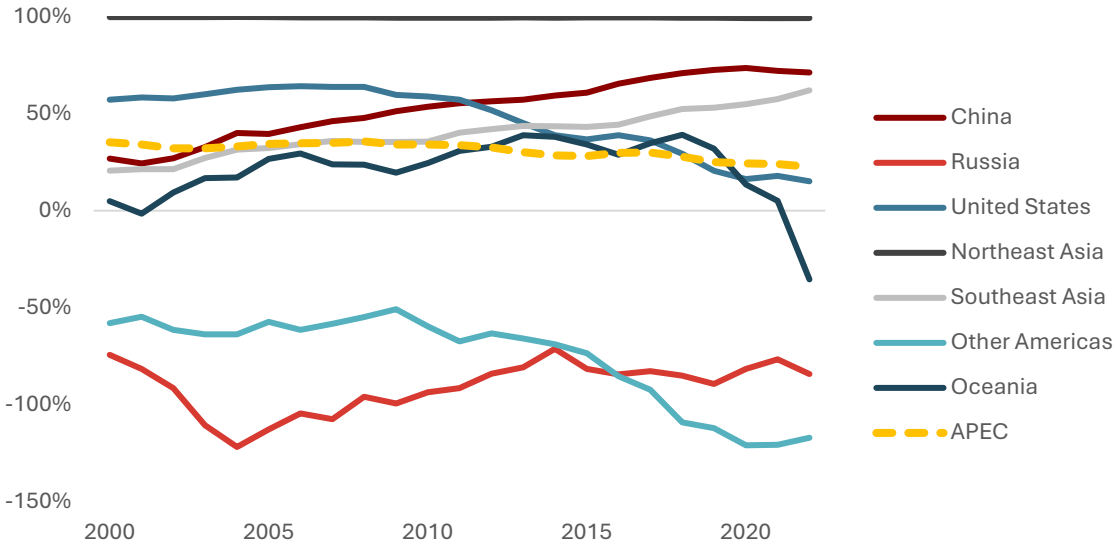
Figure 3-1: APEC crude oil export (left) and import (right), 2000 - 2022 (mb/d)



Source: EGEDA (2024)

In general, APEC continued to reduce its import dependency on crude oil and NGLs, which fell by 1 percentage point between 2022 and 2023. This was driven by the surge in domestic tight oil output in the United States, rising oil sands production in Canada and higher export volumes of crude oil from Oceania (Figure 3-2).

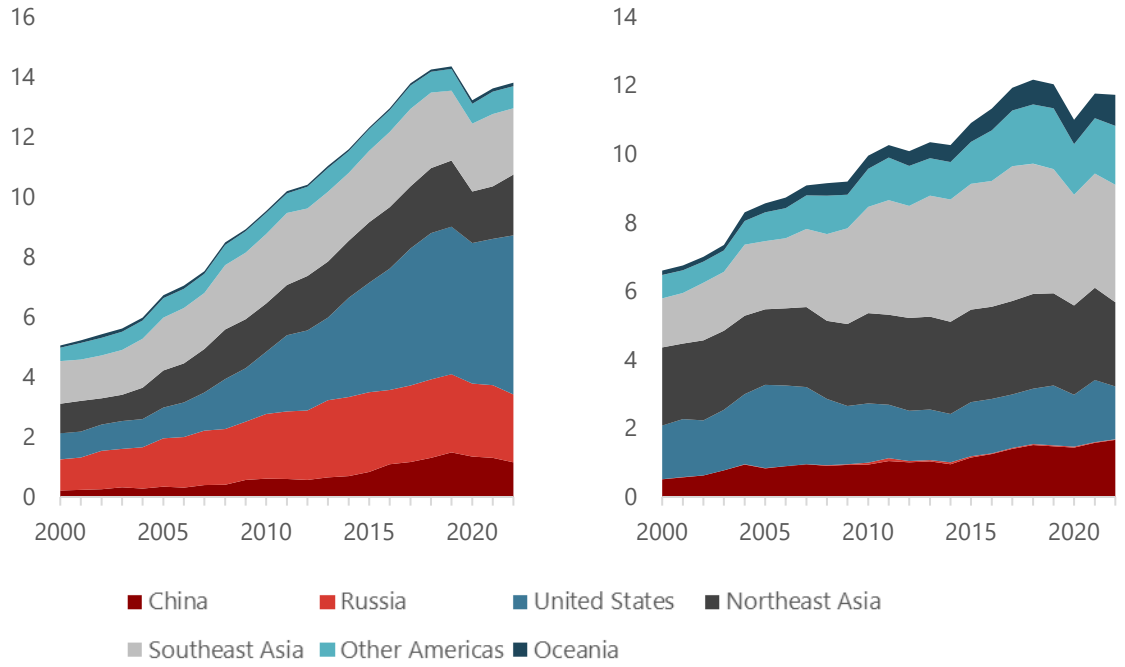
Figure 3-2: APEC crude oil and NGLs import dependency by subregion, 2000 – 2022



Source: EGEDA (2024)

Petroleum products

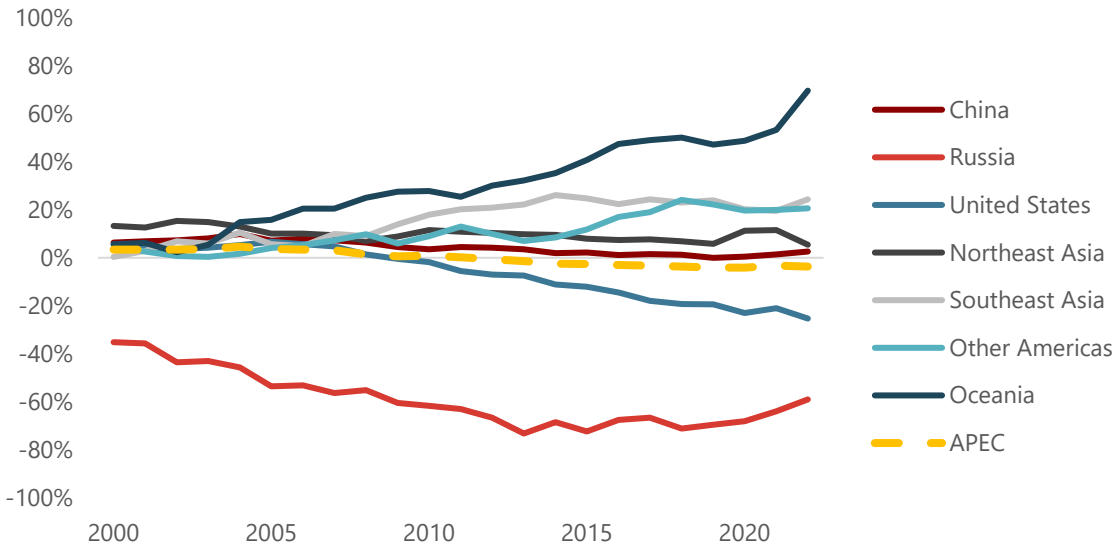
Figure 3-3: APEC petroleum products export (left) and import (right), 2000 - 2022 (mb/d)



Source: EGEDA (2024)

Export of petroleum products in APEC more than doubled between 2000 and 2022, with United States dominating the export growth by more than 6 times. China also exported 5 times more petroleum products in 2022 than in 2000, of which diesel and fuel oil were the major products (Figure 3-3). APEC remained a net exporter of petroleum products, with its import dependency being -4% in 2022 (Figure 3-4).

Figure 3-4: APEC petroleum products import dependency by subregion, 2000 - 2022



Source: EGEDA (2024)

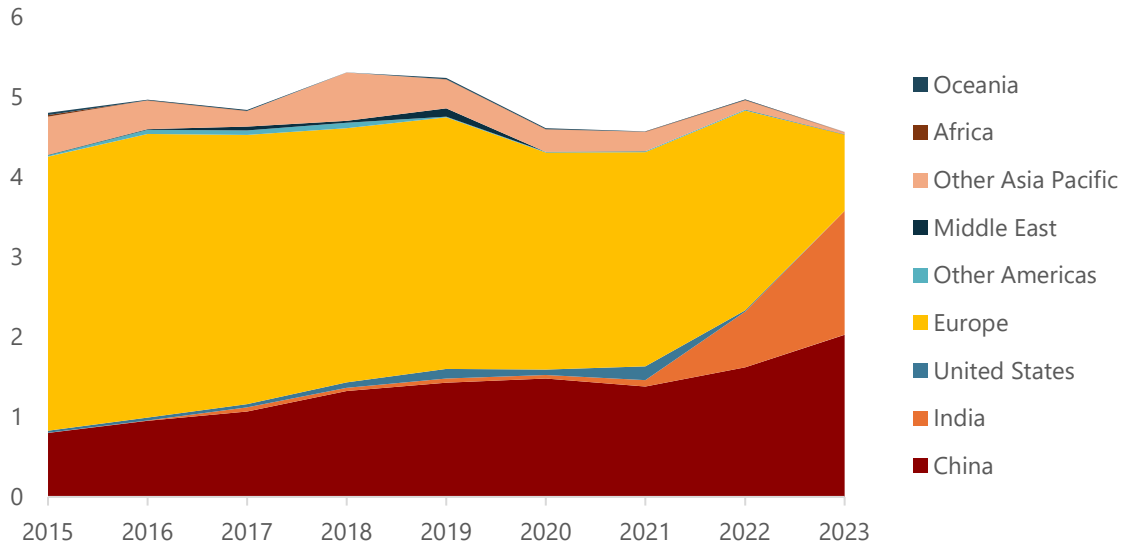
China and India were the two main buyers of Russian crude in Asia

Russia's crude oil export volume declined by 8% in 2023 from 2022 levels, driven largely by decrease in exports to Europe as European Union (EU) imposed sanctions on Russian oil (Figure 3-5). As a result, European share of Russian crude fell from 44% in 2022 to just 13% in 2023, as European refiners opted for sweeter grade crudes from the United States. To compensate for the lost European market, Russia has since redirected its crude to the Asian market, particularly China and India, which accounted for 44% and 34%, respectively in 2023.

Most of the Russian crude was shipped to China via the Arctic Ocean on the Northern Sea Route (NSR) throughout 2023, as the route offers a faster shipping time than the Suez Canal. As of now, there are no other international transits along the NSR, indicating that the route is entirely dominated by Russia-China trade.

Russian exports to India also more than doubled from 0.69 mb/d to 1.54 mb/d between 2022 and 2023, taking advantage of the discounted Urals price relative to that of Brent crude. Most of the crude oil bound for India's two largest refineries (Vadinar and Jamnagar refineries) were transported from Primorsk and Ust-Luga ports in Baltic Sea and the Black Sea port of Novorossiysk.

Figure 3-5: Russia crude oil exports, 2015 - 2023 (mb/d)



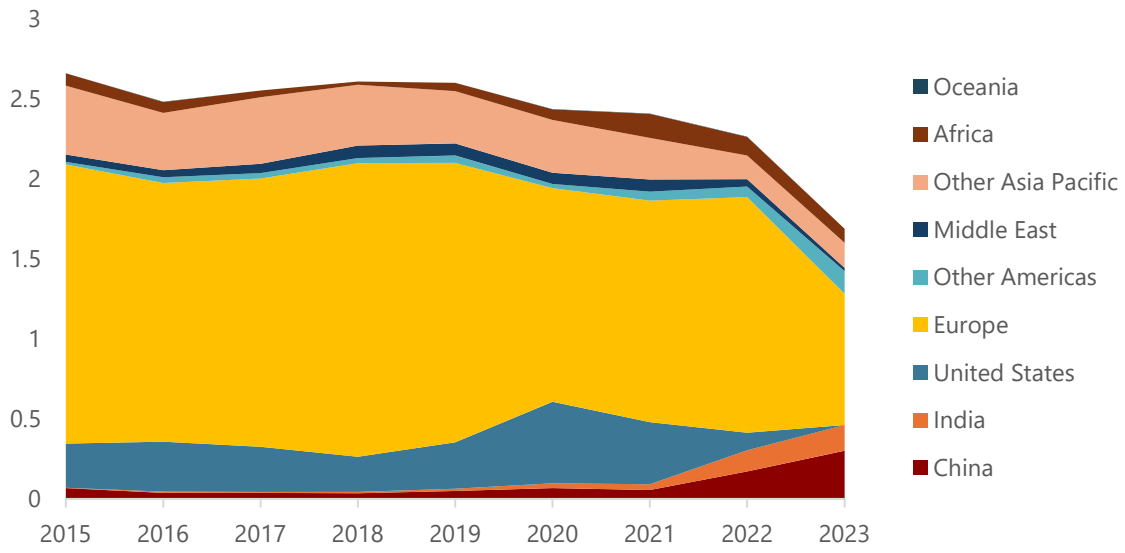
Source: EGEDA (2024), EI (2024)

Europe reduced its reliance on Russian petroleum products

The sanctions imposed by the EU, who has been the largest recipient of Russian petroleum products, have significantly reduced Europe's intake of these products, and consequently Russia recorded a decline of 25% in its export in 2023 from 2022 levels (Figure 3-6). Similarly, the United States effectively cut off its import of Russian products in 2023.

While some European economies were still reliant on Russian petroleum products in 2023, Russia has since redirected its surplus petroleum products to the Asian market, particularly to China and India. In 2023, China absorbed approximately 0.30 mb/d of petroleum products while India imported an estimated volume of 0.16 mb/d.

Figure 3-6: Russia petroleum products exports, 2015 - 2023 (mb/d)

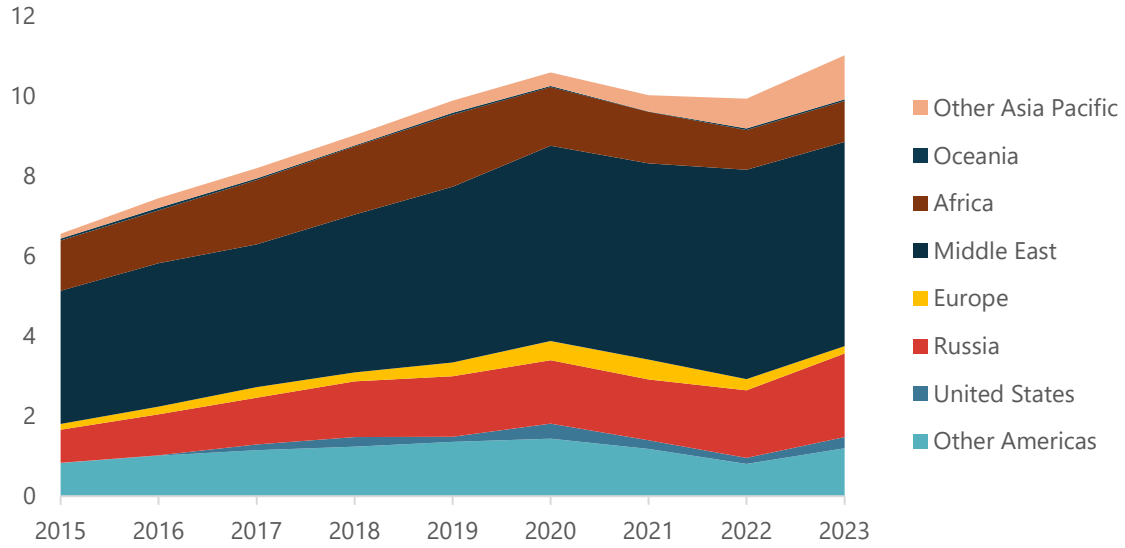


Source: EGEDA (2024), EI (2024)

China imported record amounts of crude oil in 2023

Crude oil imports to China increased by 11% in 2023 from 2022 levels, settling in at over 11 mb/d, to support the economy's increasing refining capacity for its growing transportation fuel needs and petrochemical industry (Figure 3-7). Majority of the increase in imports came from Russia, United States and Other Americas (Brazil and Canada). Volumetric-wise, China imported the largest amount of crude from Russia (0.41 mb/d), followed by Other Americas and Other Asia Pacific at 0.39 mb/d and 0.36 mb/d, respectively.

Figure 3-7: China crude oil imports, 2015 - 2016 (mb/d)

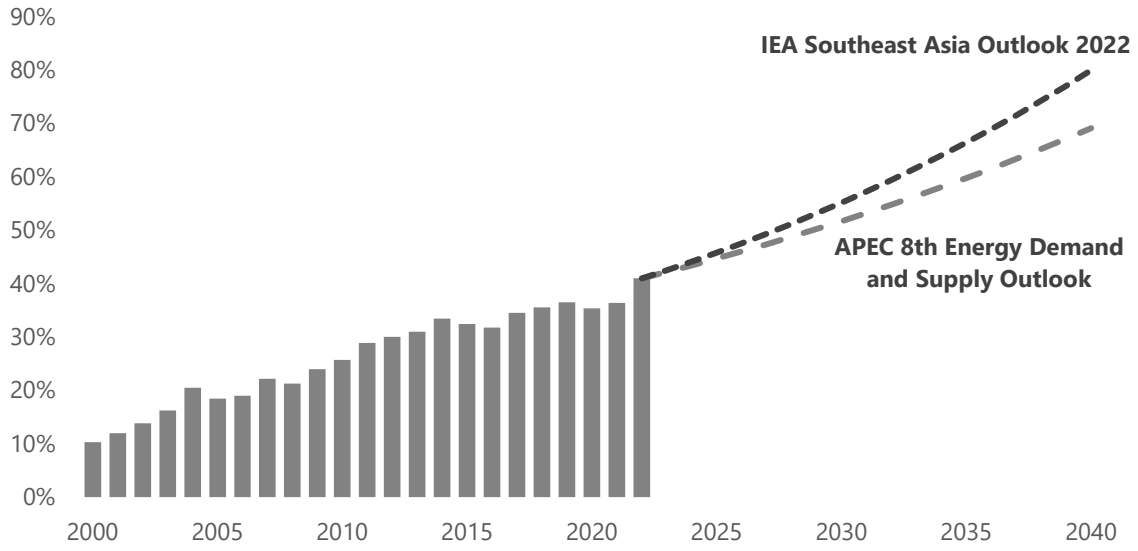


Source: EGEDA (2024), EI (2024)

Southeast Asia needs to import larger volume of oil to grow its future economy

Southeast Asia is one of the most dynamic subregions in APEC experiencing rapid economic and population growths, leading to a rise in energy demand. The subregion has been a net oil importer since the mid-1990s, and over the last two decades, its oil import dependency has risen from 10% in 2000 to 41% in 2022. Over the next 20 years, as maturing fields and lack of new discoveries continue to drive down crude oil production, Southeast Asia would need to import larger volumes of crude oil than ever before, and that import dependency is expected to reach between 70% and 80% (Figure 3-8).

Figure 3-8: Southeast Asia oil import dependency, 2000 - 2040



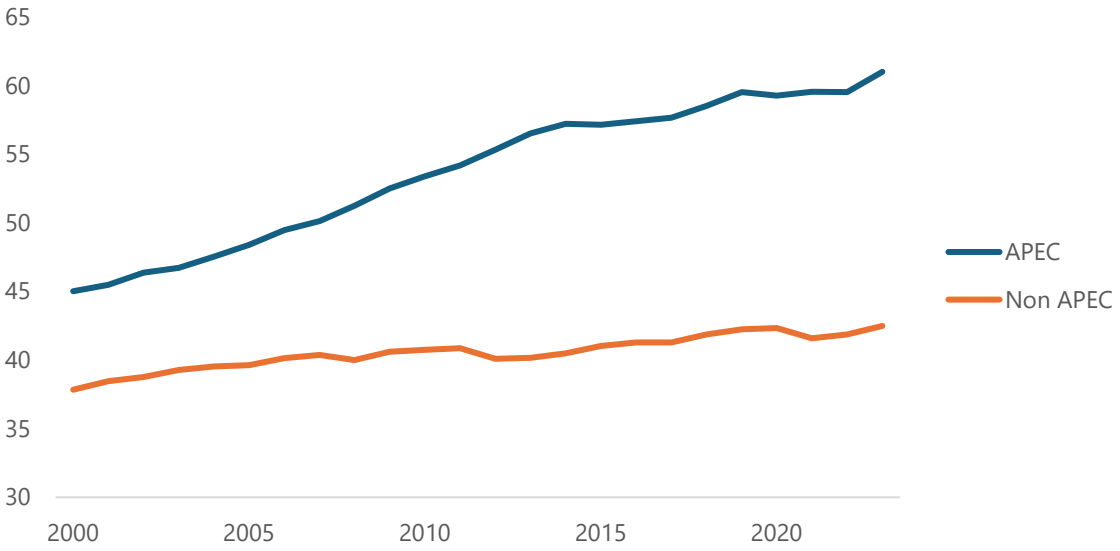
Source: EGEDA (2024), IEA (2022), APERC (2022)

Chapter 4. Refining

Global refining capacity reached all-time highs in 2023

Global petroleum refining capacity reached 103.5 mb/d in 2023 with a net increase of 2.10 mb/d. This marked the second consecutive year of increases in global refining capacity since its contraction during the COVID-19 pandemic. It also marked the highest global capacity increase in a single year since 2000, exceeding the 1.86 mb/d net capacity additions in 2009. APEC refining sector contributed most of the capacity additions at 1.47 mb/d. Total APEC refining capacity stood at 61.0 mb/d as compared with non-APEC at 42.5 mb/d in 2023 (Figure 4-1).

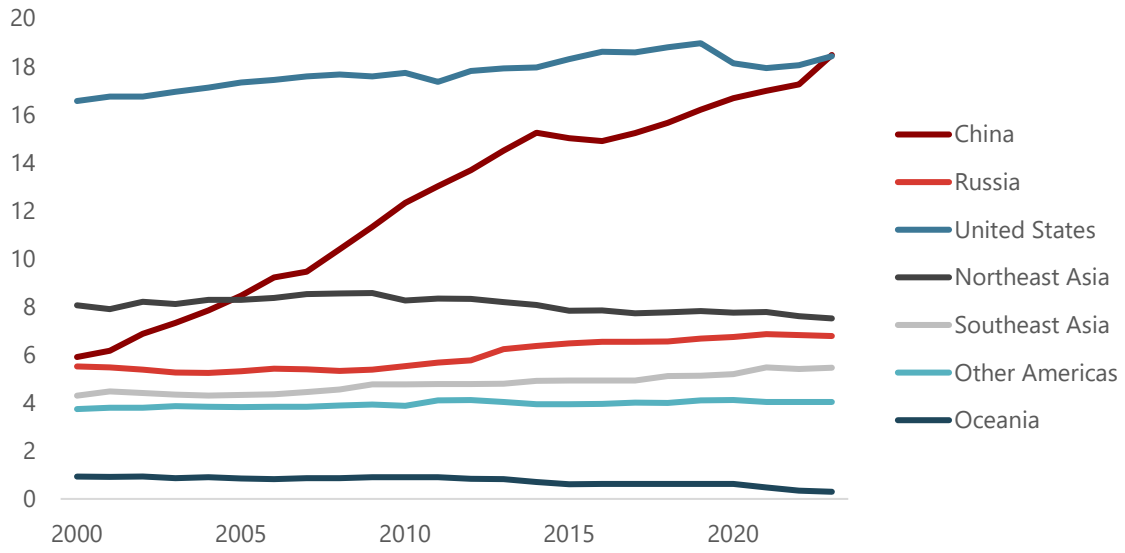
Figure 4-1: Global refining capacity, 2000 - 2023 (mb/d)



Source: EGEDA (2024), IEA (2022), APERC (2022)

Refinery capacity additions diverged between APEC subregions (Figure 4-2). China had the highest capacity addition since 2000 at 1.22 mb/d, compared to its historical average of 0.51 mb/d yearly addition. It is noticeable that the 18.48 mb/d capacity of China in 2023 exceeded the United States' refining capacity of 18.43 mb/d for the first time. United States recorded a 368 kb/d net addition in 2023, followed by Southeast Asia at 61 kb/d. Conversely, APEC Northeast Asia recorded a decrease of 95 kb/d, followed by 46 kb/d and 40 kb/d decreases of Oceania and Russia, respectively. In 2023, total capacity of Northeast Asia and Oceania stood at 7.5 mb/d and 0.3 mb/d, respectively. Other Americas maintained its refining capacity in 2023. Refining capacity in Northeast Asia and Oceania has declined continuously since 2010.

Figure 4-2: APEC refining capacity by subregion, 2000 - 2023 (mb/d)

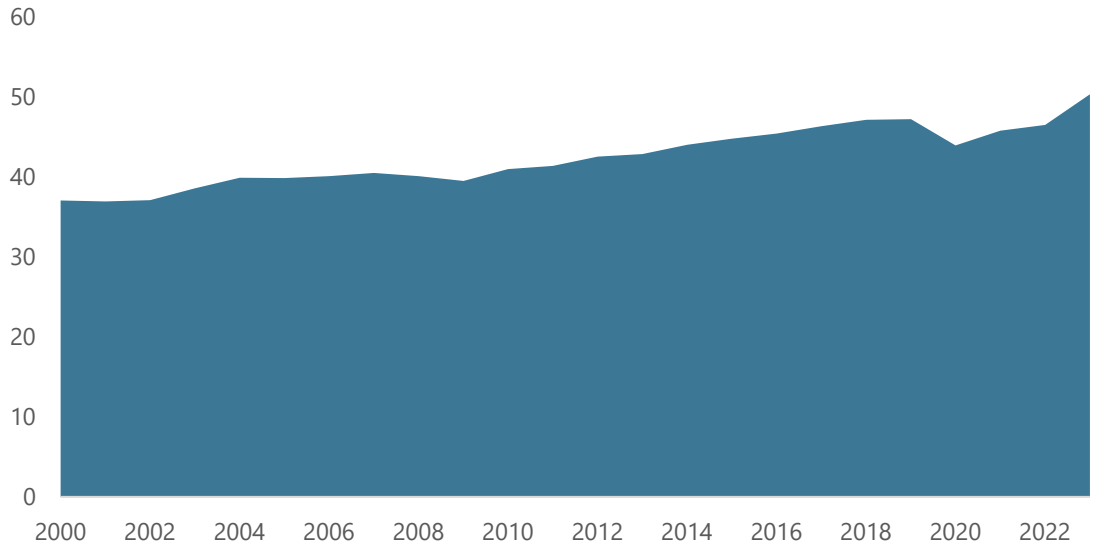


Source: EI (2024)

Crude oil intake reached the highest volume in 2023, with strongest improvement in capacity utilisation

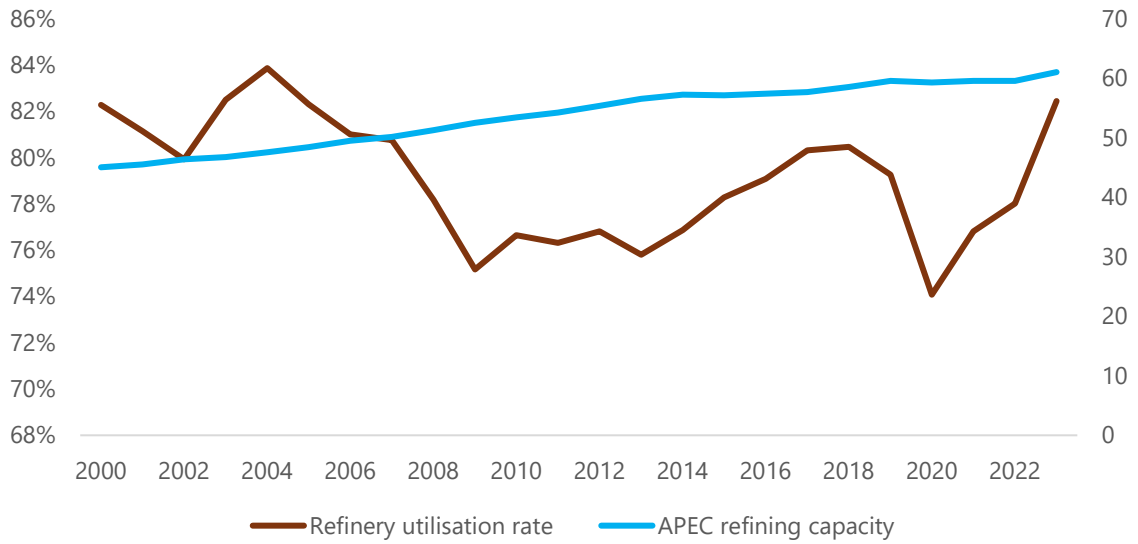
Refineries in APEC processed about 50.3 mb/d of crude oil in 2023, which was the highest level in 20 years. This crude oil intake marked an increase of 3.8 mb/d over 2022 levels, which was also the largest year-on-year increase (Figure 4-3). Likewise, the refinery utilisation rate in APEC stood at 82%, exceeding pre-COVID-19 level of 80% (Figure 4-4). The utilisation rate improved 4% over the previous year, marking the most rapid percentage point increase in utilisation since 2000 despite the refinery capacity additions in 2023.

Figure 4-3: APEC refinery crude oil intake, 2000 - 2023 (mb/d)



Source: EI (2024)

Figure 4-4 APEC refinery utilisation rate (left) and refining capacity (right) (mb/d), 2000 - 2023

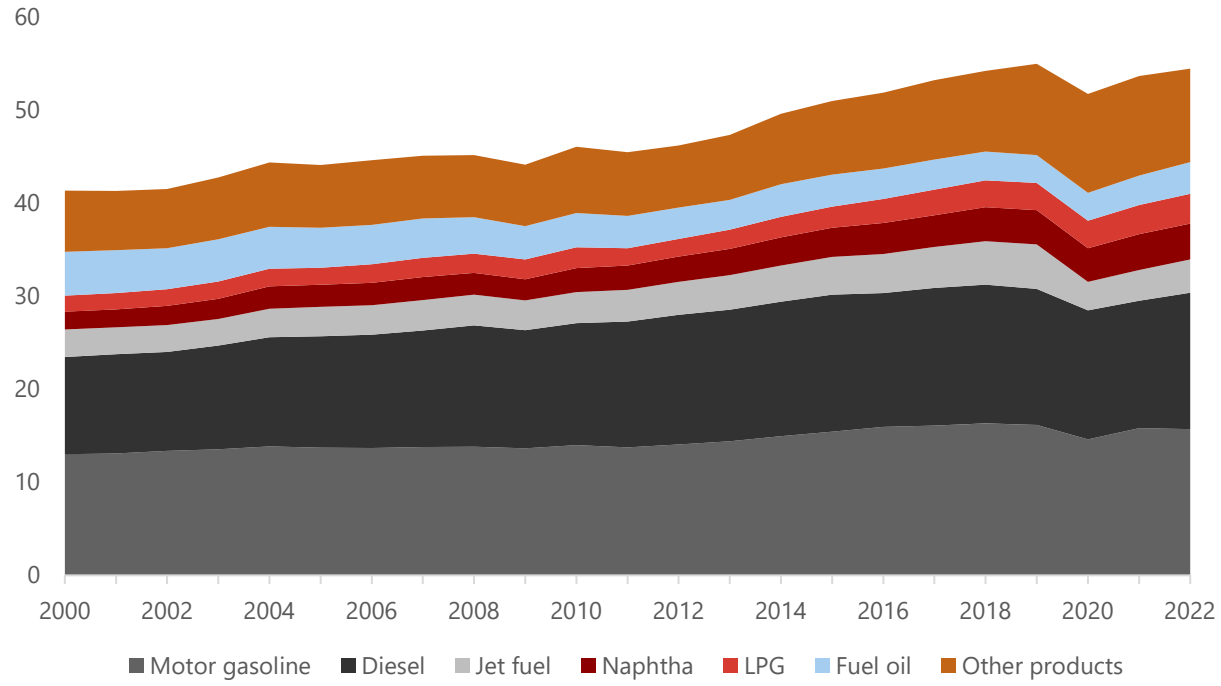


Source: EI (2024), EGEDA (2024)

APEC refinery outputs likely to exhibit highest growth in 2023

APEC refinery outputs in 2022 stood at 54.4 mb/d and were lower than the 54.9 mb/d level reached in 2019. Gasoline and diesel outputs stood at 15.7 mb/d and 14.7 mb/d in 2022, respectively, both lower than pre-Covid-19 levels (Figure 4-5). Output of jet fuel was 3.5 mb/d, also not fully recovered since the pandemic. Conversely, naphtha and LPG outputs exhibited continuous increases and were not much affected during the pandemic. APEC refinery outputs in 2023 were likely to exhibit a much stronger growth than 2022, taking into consideration increases in refining capacity, crude oil intake, and refinery utilisation rates, but the official data are not yet available at the time of this report.

Figure 4-5: APEC refining output by product, 2000 - 2022 (mb/d)

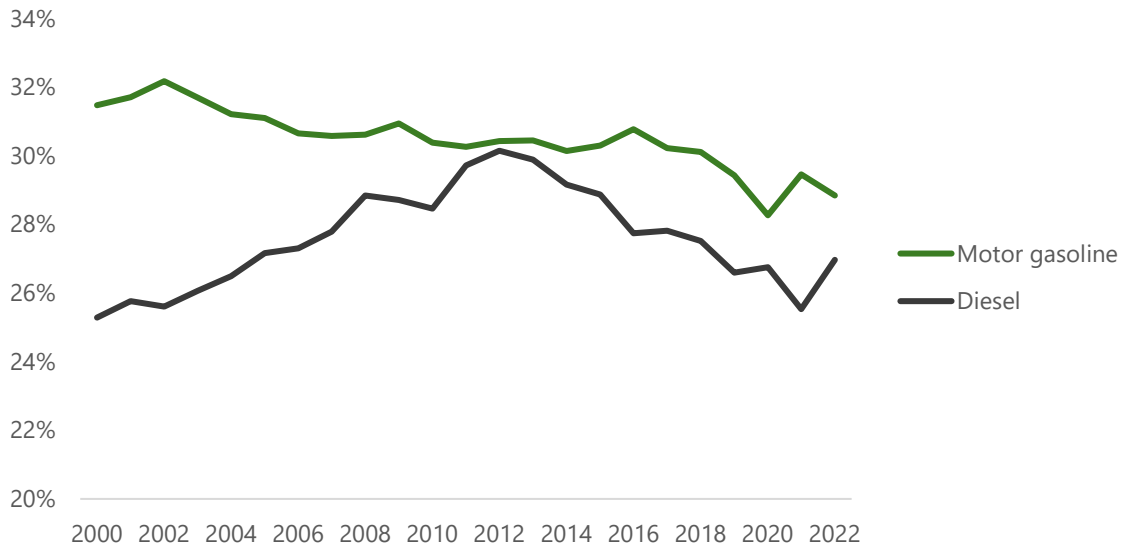


Source: EGEDA (2024)

Significant adjustments in refinery output yield ratios in the past 15 years

Output yield ratios of the APEC refining sector have exhibited significant changes. The share of gasoline continued its decline from 31.7% in 2000 to 28.8% in 2022. Conversely, the share of diesel increased from 25.3% in 2000 to a level on par with gasoline in 2012 at 30.1%, before declining to 27% in 2022 (Figure 4-6).

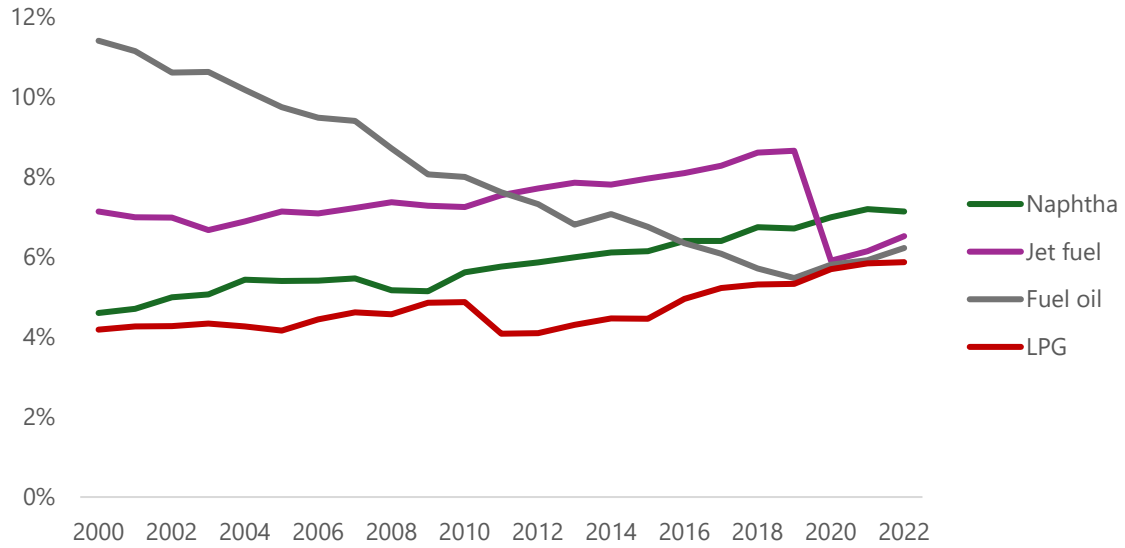
Figure 4-6: APEC refinery output yields for gasoline and diesel, 2000 - 2022 (%)



Source: EGEDA (2024)

In addition to gasoline and diesel, the output shares of naphtha and LPG exhibited strong growth for the past 12 years partly due to growth in petrochemical sector (Figure 4-7). Output share of jet fuel improved to 6.5% in 2022 but was unable to rebound to its pre-pandemic level of 8.7%. The share of fuel oil declined substantially from 11.4% in 2000 to 5.5% in 2019, before increasing to about 6% in 2022.

Figure 4-7: APEC refinery output yields for other petroleum products, 2000 - 2022 (%)



Source: EGEDA (2024)

Chapter 5. Price movements

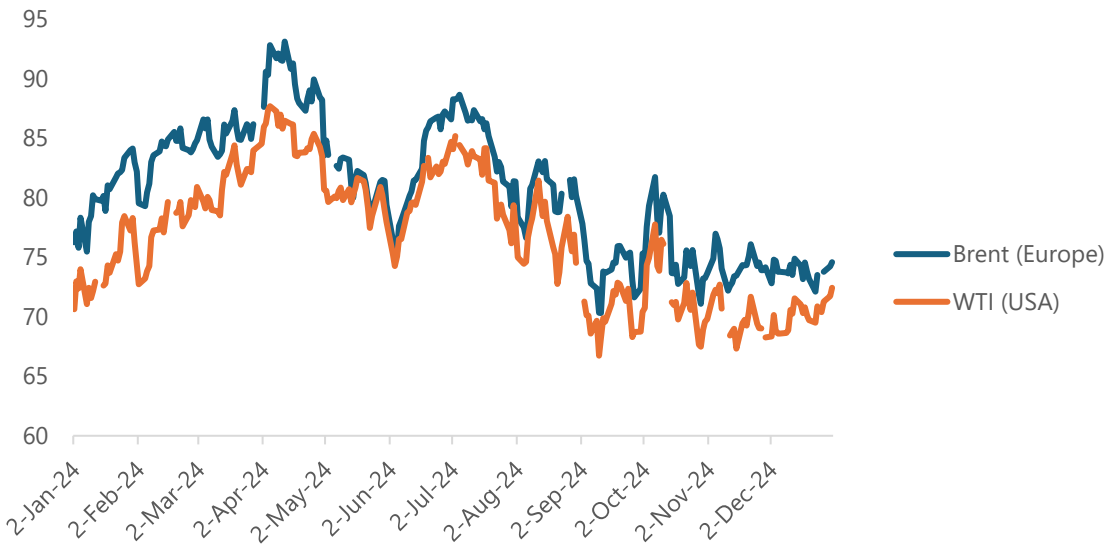
Crude oil spot prices

Brent crude oil price averaged USD 80.52 per barrel in 2024, down by almost USD 2 per barrel from the previous year. Intraday prices ranged from USD 70 to USD 93, which was the narrowest range since 2003 (Figure 5-1).

The beginning of 2024 saw Brent crude rising to USD 93 on 12 April, due to geopolitical risks associated with Middle East conflicts, which have put supply at risk. In addition, conflicts in the Red Sea forced the ships, including oil tankers, to reroute to avoid the area. Beyond April, prices generally declined throughout the remainder of the year, with rebounds noticeable in July and October due to OPEC+ announcements to forego production increases.

A potential economic downturn as well as concerns over weak oil demand in China, particularly motor gasoline and diesel in its road transport sector, pushed the prices downward, eventually settling at USD 74 at the end of 2024.

Figure 5-1: Crude oil price movements, January – December 2024 (USD per barrel)



Source: EIA (2024)

Petroleum products crack spreads

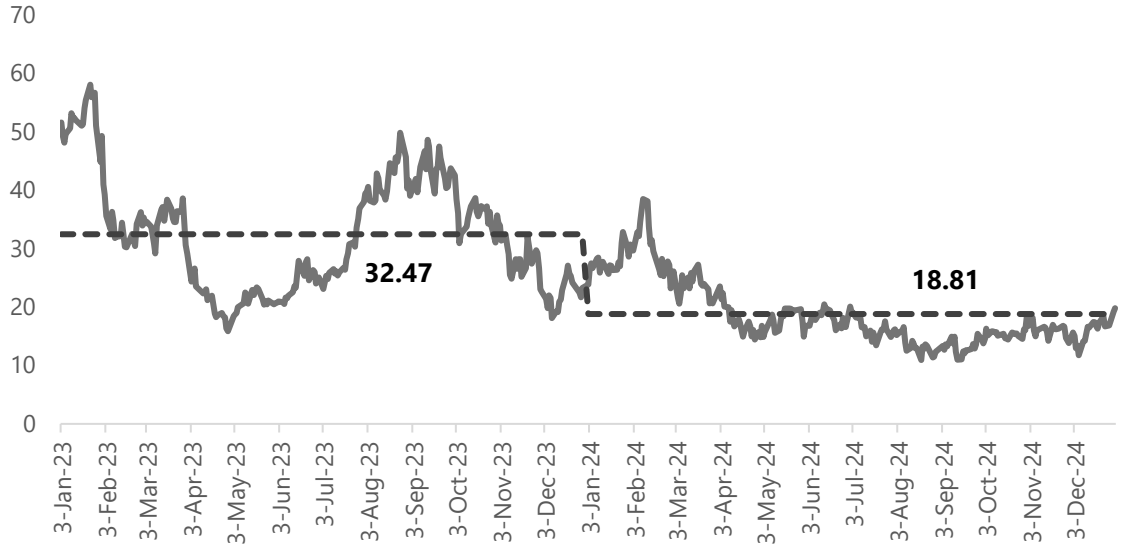
A petroleum products crack spread is the difference between the price of a particular petroleum product and the price of crude oil. Crack spreads are important as they indicate the supply-demand balance of each petroleum product and reflect the profitability of producing that specific product. This section explores gasoline and diesel crack spreads in US Gulf Coast market.

Figure 5-2: US Gulf Coast gasoline crack spread, January 2023 - December 2024 (USD per barrel)

Source: EIA (2024)

The average Gulf Coast crack spreads for gasoline and diesel in 2024, relative to the Brent crude price, were generally lower than in 2023. Sluggish domestic demand for gasoline and increased refining capacity in 2024 caused an inventory build, which narrowed the average gasoline crack spread by USD 8.40 per barrel (Figure 5-2). Likewise, the average crack spread for diesel declined by USD 13.66 per barrel, given that overall manufacturing activity had decreased in the second and third quarters of 2024, leading to declines in trucking activity (Figure 5-3).

Figure 5-3: US Gulf Coast diesel crack spread, January 2023 – December 2024 (USD per barrel)



Source: EIA (2024)

Refinery profits have declined considerably since 2022, when refiners cashed in huge profits from significant crack spreads, brought about by post-COVID19 recovery in demand as well as geopolitical events in 2021 and 2022. The major United States refiners reported a slump in their third and fourth quarter profits due to increased supply inventories and slump in demand. The year-on-year fall in gasoline demand in the United States could be attributed to travellers opting to use aviation instead of driving long distances. Furthermore, penetration of vehicles with higher fuel economy and electric vehicles contributed to gasoline decline.

References

EIA (2025), 'Short-term Energy Outlook', Analysis & Projections, 11 February 2025. https://www.eia.gov/outlooks/steo/

Energy Capital & Power (2024), 'China's CNOOC to send team to Angola to discuss Block 24 exploration', 28 March 2024. https://energycapitalpower.com/chinas-cnooc-to-send-team-to-angola-to-discuss-block-24-exploration/

Energy Capital & Power (2024), '5 strategic industries for Chinese investment in Africa', 09 July 2024. https://energycapitalpower.com/strategic-industries-chinese-investment-africa/

Hellenic Shipping News (2024), 'CNOOC discovers Kaiping South oilfield in South China Sea with over 100 mil mt proven volume', Oil & Companies News, 09 September 2024. https://www.hellenicshippingnews.com/cnooc-discovers-kaiping-south-oilfield-in-south-china-sea-with-over-100-mil-mt-proven-volume/

Jakarta Globe (2023), 'Indonesia still has 68 unexplored oil and gas basins', 22 February 2023. https://jakartaglobe.id/news/indonesia-still-has-68-unexplored-oil-and-gas-basins

JKempEnergy (2024), 'U.S. diesel consumption falls as manufacturers near recession', 04 September 2024. https://jkempenergy.com/2024/09/04/u-s-diesel-consumption-falls-as-manufacturers-near-recession/#:~:text=After%20rebounding%20at%20the%20end%20of%202023,road%20diesel%20and%20other%20distillate%20fuel%20oils.&text=The%20total%20volume%20of%20petroleum%2Dderived%20and%20biomass%2Dbased,to%20June%20compared%20with%20a%20year%20earlier.

NBS (2024), 'National Data', National Bureau of Statistics of China. https://data.stats.gov.cn/english/easyquery.htm?cn=E0101

NZZ (2025), 'India is buying lots of crude oil from Russia. Who really benefits?', International View, 28 January 2025. https://www.nzz.ch/english/india-is-buying-lots-of-crude-oil-from-russia-who-benefits-ld.1867852

OPEC (2024), 'World oil outlook 2050', Organization of the Petroleum Exporting Countries, 24 September 2024.

Reuters (2024), 'Weak US gasoline demand compounds pressure on oil ahead of OPEC+ meet', 1 June 2024. https://www.reuters.com/business/energy/weak-us-gasoline-demand-compounds-pressure-oil-ahead-opec-meet-2024-05-31/

Reuters (2025), 'US oil refiners brace for a tough year as investor sentiment turns negative', 14 January 2025.
https://www.reuters.com/business/energy/us-oil-refiners-brace-tough-year-investor-sentiment-turns-negative-2025-01-13/

Reuters (2025), 'Wall Street braces for oil refiners' lower Q4 earnings, tariff plans', 29 January 2025.
https://www.reuters.com/business/energy/wall-street-braces-oil-refiners-lower-q4-earnings-tariff-plans-2025-01-29/

Safety4Sea (2024), 'New record of Russia-China crude oil shipments via NSR', 07 October 2024.
https://safety4sea.com/new-record-of-russia-china-crude-oil-shipments-via-nsr/#:~:text=Russian%20crude%20oil%20shipments%20to,attacks%20in%20the%20Red%20Sea.

Saragih J. P. (2024), 'The decline in crude oil production, surge in prices, and the burden of crude oil and fuel imports', Info Singkat, Center for Parliamentary Analysis, May 2024
https://berkas.dpr.go.id/pusaka/files/info_singkat/Info%20Singkat-XVI-9-I-P3DI-Mei-2024-182-EN.pdf

Seetao (2023), 'Bayan Oilfield becomes the first million-ton oilfield in Western Inner Mongolia', Petrochemical, 15 June 2023.
https://www.seetaoe.com/details/217797.html