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King Abdullah Petroleum Studies and Research Center



KAPSARC Oil Market Outlook (KOMO)

Q3, 2021

Summary

This quarter's demand highlights:

The drivers of this quarter's significant demand growth will be the reopening of COVID-related shutdowns/behaviors, continued economic recovery and seasonal consumption patterns. We anticipate that the most significant quarter-on-quarter (QoQ) growth will come from the U.S., followed by the OECD Europe and then Russia.

Overall, all regions except Asia are expected to witness QoQ growth in Q3 2021. Following its regular seasonal pattern and accompanied by the continued high levels of COVID cases, we estimate that India will lead the decline in demand with around 270 thousand barrels per day (Kb/d). Meanwhile, oil prices continue to increase because of the government's recent policies of raising fuel taxes. Africa is another region expected to witness QoQ declines on oil demand, roughly 210 Kb/d, as the number of infections surges and investments decline.

During the writing of this report, the supply scenario was expected to be solidified by OPEC+ members in their 31st JMMC and 18th OPEC and non-OPEC Ministerial meeting on July 1. The KOMO team delayed its publication schedule until an agreement was reached on July 18 at the 19th Ministerial meeting. Production will continue to increase by 400 Kb/d each month and allows for baseline adjustments in May 2022 for Saudi Arabia (500 Kb/d), Russia (500 Kb/d), the United Arab Emirates (UAE) (332 Kb/d), and Iraq and Kuwait (150 Kb/d each). The KOMO team assumes that as we enter 2022, a surplus will develop, resulting in OPEC+ members freezing their production levels throughout the year. Even with this freeze, the baseline adjustments mean some small changes to production for OPEC+ members (+1.7%) in May 2022, as keeping net production steady would require rebalancing among members.

Total global oil demand is expected to increase year-on-year (YoY) by 4.15 million barrels per day (MMb/d) in 2021 to 96.3 MMb/d. It is expected to grow further by 3.35 MMb/d in 2022 (100 thousand barrels per day [Kb/d] more than our Q2 2021 outlook for 2022) and return to 2019 levels by Q3 2022.

The International Monetary Fund (IMF) predicts global economic growth of around 6% in 2021, compared with a decline in real gross domestic product (GDP) of -3.3% in 2020. Moreover, in its May outlook, "No Ordinary Recovery," the OECD revised its decline in GDP to -3.5% for 2020 while revising its growth in 2021 upward to 5.8%. The upward revisions to the IMF and OECD global forecasts reflect several factors, including fiscal stimuli in a few major economies and adapting economic activity to lockdowns.

Summary continued...

In the previous publication, the KOMO team highlighted that recovery was on its way. We are pleased to see that others have aligned with our message that multiple factors will cause each country's recovery to be different. These factors include, but are not limited to, that country's vaccination rates, continued stimulus packages, policy and fiscal support for industries and a return to normal in goods and services consumption. However, we are faced today with new COVID-19 variants (such as Lambda, Beta and Delta) that have the potential to spread 60% faster than last year's strain. Consequently, there is a level of uncertainty and fears of a slower recovery if existing vaccines are less effective against these variants than against the original strain or are slow to reach a broader global population.

Nevertheless, as we review the pandemic of the past 18 months, our gaze is shifting slowly toward the aftermath of COVID-19 and the question of whether the world will be able to sustainably recover. There is no doubt that 2021 and 2022 will witness exceptional growth in the economic and energy demand dimensions, but will the actions of the world community be able to bring us back to normalcy?

The future course of government policy is uncertain and highly fragmented. There is some concern that reducing government spending too soon after the pandemic might trigger economic slowdowns like those that followed the 2008 financial crisis. The United States (U.S.) dollar has been relatively low for a prolonged period; as the U.S. Federal Reserve begins signaling an interest rate hike to limit inflation and return rates to more 'normal' levels, economists start wondering whether this is just a brief aftereffect of the post-COVID-19 era or whether it will become an ongoing issue. Higher interest rates could help lower inflation risk but could also slow down economic activity, leading to divestment in several developing countries in favor of higher returns elsewhere. Most countries will adjust interest rates to stabilize their economies, and some will seek to increase revenues by raising taxes and commodity prices. As the global community scrambles to adjust in a post-COVID-19 world that is also more climate conscious, we remain cautiously concerned that these fragmented actions might hinder future growth projections, with ripple effects on oil demand.

Nevertheless, the world today is waking up to a recovering economy, and the vaccination rollout continues at a steady rate. India seems to be controlling its outbreak, and China's oil demand remains strong despite current lockdown measures across some provinces. Summer is also here, and with that comes a strong demand bump, particularly in the U.S. and OECD Europe.

The economic recovery for many OECD countries, particularly in Europe, and for non-OECD countries in the Middle East, Eurasia, Africa and Latin America is expected to take longer than in the U.S. and some Asian countries. Asia may lead the rebound in regional oil demand in 2021, while the U.S. is expected to have the largest growth for a single country at around 1.4 MMb/d (around 250 Kb/d higher than our previous forecast). China's average demand in 2020 was 13.6 MMb/d, with a bounce in Q4 2020 to 15.8 MMb/d due to low prices and the government's relaxation of import restrictions for both teapot refiners and oil traders. We expect Chinese demand to return to normal in Q2 or Q3 of this year at around 14.2 MMb/d and 14.3 MMb/d, respectively.

Summary continued...

These base-case projections remain highly contingent on the success of measures to contain the new Delta variant and the continuation of economic stimulus packages. We assume that the pandemic (including any new COVID-19 variants) will be largely brought under localized/regional control by the end of August 2021 with no further major waves of infection or lockdowns. Q3 2021 should witness significant quarter-on-quarter (QoQ) demand growth of 3.1 MMb/d, a significant increase (60%) over the growth in Q2 2021. Although the Q3 2021 demand estimate of 98.3 MMb/d is below 2019 levels, it remains 5.5 MMb/d (YoY) higher than in the depths of the 2020 crisis when global demand plummeted.

Total global oil supply is expected to grow by about 2.15 MMb/d in 2021 (1 MMb/d higher than our Q2 2021 forecast) and by 4.97 MMb/d in 2022 (1.5 MMb/d higher than our Q2 2022 forecast). Much of this supply growth comes from the current bullish price increases, along with an OPEC+ production release schedule that is accelerated compared with prior outlooks. We expect OPEC+ members to carry most of the production rebound in 2021; increased supply will likely not be driven by new projects but by ramping up existing production capacity. At the 15th OPEC and Non-OPEC Ministerial Meeting, held in April 2021, the group agreed to increase production by no more than 500 Kb/d per month, with preliminary adjustments for May, June and July 2021 set at 350 Kb/d, 350 Kb/d and 441 Kb/d, respectively. At the 19th OPEC and Non-OPEC Ministerial Meeting on July 18, the group decided to increase production levels by 400 Kb/d monthly through December and to revise select baselines in May 2022 by 1.632 MMb/d. As a result, the KOMO team expects that OPEC+ production (all liquids) will grow this quarter by around 1.25 MMb/d and by around 1.2 MMb/d in Q4 2021. The OPEC+ agreement was previously expected to last only until April 2022, but several members called for an extension through the end of 2022 to manage market imbalances. The group has since agreed to continue cooperating until the end of 2022. The recent OPEC+ declaration stated that the group will endeavor “*to end production adjustments by the end of September 2022.*” However, an expected pause in the market’s rebalancing could come as a result of both a slowdown in oil demand as we approach the winter season and the growth in non-OPEC+ production in response to improved pricing. World oil prices have surpassed the 70 \$/bbl mark, creating a profitable environment for countries to increase production. Therefore, if OPEC and its partners wish to maintain a balanced market, they may need to maintain their cuts throughout 2022.

While there is the potential for additional production over the coming period, U.S. shale is a key wildcard for potential recovery and adds significant uncertainty to the supply forecast. Under the current price environment, we forecast shale to decline by only around 470 kb/d in 2021 while growing by 540 MMb/d in 2022.

These base-case supply/demand trends suggest that supply deficits will end in Q4 of 2021 and carry through 2022, with a surplus ranging between 0.4 and 2.7 MMb/d quarterly and averaging 1.6 MMb/d in 2022. Again, the current 2022 balance outlook assumes that OPEC+ members will maintain steady production levels while adding some capacity in May 2022, vaccination programs will allow for further but slower economic recovery, and the spread of the new COVID-19 variants will be controlled in the foreseeable future.

Summary continued...

Based on the forecast imbalances projected by our base-case assumptions in 2021, we assume OPEC+ may face some challenges in 2022. There is the risk of an oil surplus during the winter of 2021/2022 due to seasonal demand declines and a modest non-OPEC+ supply recovery. In the first half of 2022, OPEC+ may be required to reintervene with modest temporary cuts if inventory builds faster than desired.

Maintaining cuts starting in the coming winter season can preserve market stability. Although not reflected in our outlook, the prospects of continued inventory withdrawals beyond 2022 may give OPEC+ members room for larger production increases without jeopardizing prices. As always, OPEC+ compliance rates will be a significant factor driving production as pricing and fiscal realities test the resolve of some members.

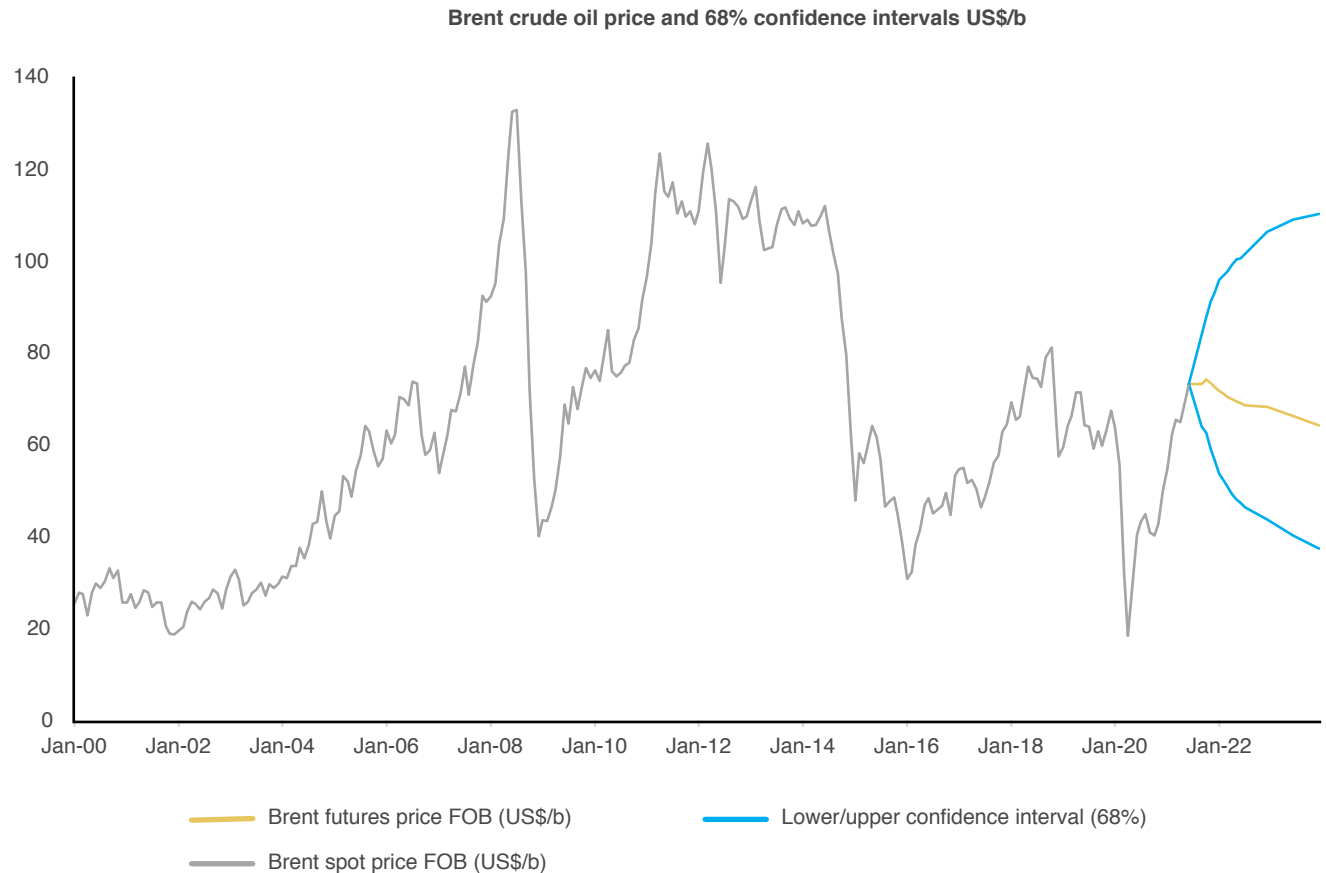
Under these assumptions, target inventory levels for the OECD are expected to decline by 56 MMb to 4,579 MMb in 2021 and increase by 36 MMb in 2022. Actual inventory levels are expected to overshoot the desired targets, reaching 4,716 MMb in 2021 and increasing by 153 MMb in 2022. Real inventory levels that continue to be above the desired capacity are expected to create another year of bearish prices. However, as we do not expect much inventory variation, we estimate that prices will decline unless OPEC+ takes new actions.

Note: Although the level of OECD inventories is often used as an indicator, which is presumed to revert to its five-year average, it does not depict a holistic picture of global inventories. This indicator does not inherently reflect the extent of the role of OPEC+ in helping manage these inventories.

| | 2019 | 2020 | Growth | 2021 | Growth | 2022 | Growth |
|---------------|-------|------|--------|------|--------|-------|--------|
| Demand | 99.6 | 92.2 | -7.4 | 96.3 | 4.2 | 99.7 | 3.4 |
| Supply | 100.6 | 94.2 | -6.4 | 96.4 | 2.2 | 101.3 | 5.0 |
| Δ | 1.0 | 2.0 | | 0.0 | | 1.6 | |

Summary (prices)

The confidence interval is derived from options market prices and the futures curve, which represent the views of a wide array of market participants, such as producers, refiners, airlines, speculators, and others.



Source: KAPSARC calculations based on NYMEX data, CME Group, FINCAD, July 2021.

| US\$/b | Q3 2021 | Q4 2021 | Q1 2022 | Q2 2022 | Q3 2022 | Q4 2022 | Q1 2023 | Q2 2023 |
|---------|-------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Futures | \$73.16 | \$73.29 | \$71.02 | \$69.39 | \$68.50 | \$68.09 | \$66.11 | \$64.13 |
| 50% CI | \$66 - \$80 | \$63 - \$85 | \$58 - \$89 | \$54 - \$89 | \$50 - \$92 | \$50 - \$92 | \$47 - \$93 | \$44 - \$92 |
| 68% CI | \$63 - \$83 | \$59 - \$91 | \$48 - \$99 | \$48 - \$100 | \$46 - \$101 | \$43 - \$106 | \$40 - \$108 | \$37 - \$110 |
| 95% CI | \$56 - \$95 | \$48 - \$111 | \$38 - \$131 | \$33 - \$142 | \$31 - \$148 | \$28 - \$163 | \$25 - \$177 | \$22 - \$186 |

Note: CI = confidence interval

Key issues for the oil market in 2021 and 2022

To better understand what to expect in the next eight quarters, KOMO assumes that OPEC+ aims to reduce market fluctuations. Based on macroeconomic indicators, the KOMO team believes that countries such as the U.S., China and India have great potential for increasing their demand levels even if sequential growth begins to ease heading into 2022. Nevertheless, under this assumption of continued strong but easing demand growth, the world is expected to witness an oil surplus in the near term (4-16 months). With prices near 70 \$US/bbl, it seems that non-OPEC+ producers are expected to increase production, but these flows will hit world oil markets gradually. Coupled with the modest demand growth expected in Q1 and Q2 of 2022, we can therefore assume that OPEC+ may slow down their easing of cuts and maintain production levels going into 2022.

The KOMO team recently conducted the biannual risk survey, and most responses were not too optimistic for the next four quarters. However, respondents generally believe that normality will return during 2022 and largely agree that there is low risk of an economic downturn. The hope is that over 50% of the global community will be vaccinated by mid-2022 and Asia will also control its resurging COVID cases by that time. Localized control of outbreaks instead of nationwide measures should allow for further return to normal for most countries.

As an example of national vs. global impacts, the aviation sector represents around 5% of global oil

consumption; although national flights are returning to pre-pandemic levels, long- and medium-haul flights are growing very modestly. We estimate that simply increasing the vaccination levels and having countries open their borders will increase the demand for aviation fuel by around 2-3 MMb/d.

Overall, we anticipate 2021 will witness gradual but significant growth for oil demand in both OECD and non-OECD countries at around 2.1 MMb/d for each of these regions. Subsequently, in 2022, after many countries (led by the non-OECD) have regained most of their lost demand, they will start to follow their traditional growth projections.

Our forecast may evolve further in the next report. The uncertainties are all contingent on the economic activities of each country. Among many other variables, service economies, travel dependence, investments, vaccine hesitancy and interest rate dynamics play important roles. As we start to step out of this pandemic, countries' reactions will differ and so will their oil demand. While some countries might take advantage of this demand decline to push forward with their climate change agendas, others will have no choice but to consume more to catch up in their economic growth trajectories. Where some might continue with their stimulus packages, others have increased fuel prices.

- “The World Economic Outlook, April 2021: Managing Divergent Recoveries” prepared by the

IMF estimates that global GDP for 2020 declined by 3.3%, compared with growth of 2.8% in 2019. It also states, “Global growth is projected at 6 percent in 2021, moderating to 4.4 percent in 2022. The projections for 2021 and 2022 are stronger than in the October 2020 WEO [World Economic Outlook]. The upward revision reflects additional fiscal support in a few large economies, the anticipated vaccine-powered recovery in the second half of 2021, and continued adaptation of economic activity to subdued mobility. High uncertainty surrounds this outlook, related to the path of the pandemic, the effectiveness of policy support to provide a bridge to vaccine-powered normalization, and the evolution of financial conditions.” (March 23, 2021)

- Fiscal stimulus package distributions are expected to play an important role in supporting consumers and businesses in the shadow of COVID-19. Coupled with the uncertainty in many OECD countries surrounding negative or low short-term interest rates, there is an indication of a modest recovery. However, as the specter of inflation returns and the U.S. Federal Reserve signals the possibility of increasing interest rates, the global recovery might become more uneven.

Oil also plays a role in containing inflation, as stated by HRH Prince Abdulaziz Bin Salman on June 23: “We also have a role in taming and containing inflation by making sure that this market doesn't get out of hand.”

Key issues for the oil market in 2021 and 2022...

- The resurgence of COVID-19, although controlled today in major economies such as China and India, is taking a toll in other locations like Africa and the emerging markets in Latin America and Asia. Even though the African continent consumes 5% of the global oil demand, its demand may deserve further investigation in our next publication.
- Some analysts expected that geopolitical tensions would subside on many fronts with the JCPOA restarting and removing sanctions on Iran, China reaching out to resume talks with the U.S., and multiple elections in Latin America with smooth transitions. However, little has developed so far, and as these issues continue, no real changes are expected. See the accompanying editorial at the end of this report for more about Iran.

On the supply side, OPEC+ compliance has remained high throughout Q2 of 2021, and the market, while still shaky, is much less volatile than earlier in the year. Combined with improving demand, we have an environment that will support measured supply growth. Although we do not expect a significant return from non-OPEC+ countries this year, the current environment can promote further growth in 2022. Nevertheless, we estimate that most of the growth this year will come from existing projects and OPEC+ in particular (total liquid supply growth projections for OPEC+: 1.8 MMb/d in 2021 and 3.8 MMb/d in 2022 – non-OPEC+: 370 Kb/d in 2021 and 1.1 MMb/d in 2022).

QoQ, global supply in Q3 2021 is expected to increase by 2.3 MMb/d, which is a slower pace of growth than Q2's estimate of around 2.7 MMb/d. This quarter's growth is largely driven by Saudi Arabia and OPEC+ partially easing group production targets. OPEC+ members are expected to account for over 60% of production growth this quarter. Despite the recent news that drilling activity is picking up in North America, an overall decline in investment and more stringent policies are expected to cause flat-to-declining shale production in 2021 before recovering in early 2022. Notwithstanding a brief weather-driven decline in drilling activity earlier this year, U.S. shale production is expected to stabilize and begin rising modestly during the second half of 2021 (while maintaining an average annual decline in 2021) before bouncing back in 2022. In the past weeks, reports on drilling activity in the Bakken and Eagle Ford have surged, demonstrating that profits may be made and signaling that production has the potential to exceed our previous expectations. Indeed, in our Q2 2021 KOMO report we highlighted that *"Improved pricing may also allow for a sharper-than-expected recovery in drilling activity and production,"* and current activity is following that trend.

Recent political and economic developments have complicated supply forecasts. The Biden administration's long-term goals and the short-term impacts of its policies aimed at speeding up the energy transition under the 'Green New Deal' (and similar policies in other countries) make it safe to assume that investors may be less optimistic about the oil sector's future profits. This could be more of an issue

for international oil companies (IOCs) and beneficial for national oil companies (NOCs) in the long term if oil demand outstrips efforts to mitigate its use.

We expect Libya to witness the largest production growth this year, at around 880 Kb/d (largely due to the recovery already seen), followed by Iran (540 Kb/d), Russia (210 Kb/d) and Canada (190 Kb/d). Although Iran is currently in talks to re-join the JCPOA, our recent survey indicates that this is not likely to happen quickly. News chatter and other sources support the insight that the process of lifting sanctions may take longer than previously expected. See the accompanying editorial at the end of this report.

Adequate inventory and high spare capacity levels persisting through 2021 should be sufficient to mitigate any short-term 'negative' supply shocks, resulting in gradual price movements with less volatility. Prices could see additional downward pressure if efforts to limit the spread of the new Delta variant fail or OPEC+ members relax their cuts too quickly (through agreed easing or erosion of discipline). Based on our forecasted balances, this downside risk seems to persist well into 2022.

KOMO's supply/demand forecast is an average for each quarter and does not consider short-term volatility. Actual changes to supply and demand will, of course, remain volatile, reflecting the responses to and duration of the COVID-19 pandemic. Other challenges may include unexpected oil supply cuts due to hurricanes, OPEC+ compliance, and upheavals in developing countries, among others.

Demand forecast

Global oil demand is projected to grow by a record 4.2 MMb/d in 2021 and further increase by 3.4 MMb/d in 2022 YoY. Moreover, global demand is expected to accelerate QoQ in Q3 2021 by 3.1 MMb/d, after QoQ growth in Q2 2021 of around 1.8 MMb/d. The predicted growth comes from seasonal summer driving and the vacation period, easing of health measures, recovering economies in Europe and Asia, and improved U.S. demand, particularly in gasoline. Vaccine rollouts have accelerated, despite some lockdown measures in certain countries/states.

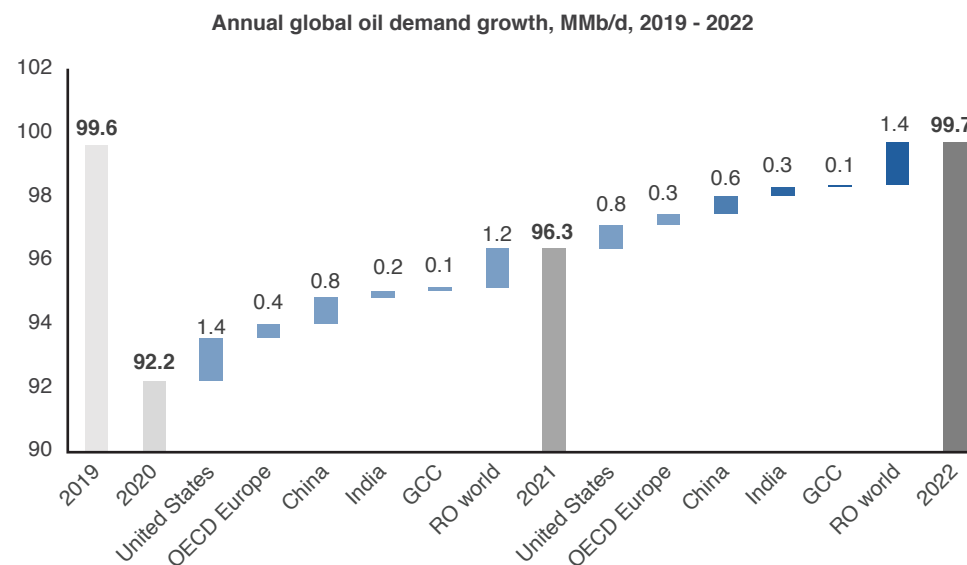
We expect OECD countries to witness oil demand growth similar to that of non-OECD countries this year, at around 2.1 MMb/d. We estimate that most OECD growth will be in the U.S., representing 94% of OECD Americas' growth and 64% of total OECD growth. Indeed, as the U.S. was the country most affected by the 2020 oil demand downturn, it will experience the strongest rebound in demand. We estimate demand will grow by around 1.4 MMb/d for OECD Americas (200 Kb/d more than our last outlook), followed by OECD Europe at 420 Kb/d and OECD Asia-Oceania by 250 Kb/d. Asia will represent most of the demand growth for 2021, followed by Latin America and Africa. Non-OECD Asia is expected to grow by around 1.8 MMb/d, followed by Latin America at around 320 Kb/d and Africa by around 50 Kb/d.

In contrast, both the Middle East and Eurasia are anticipated to witness demand declines in 2021 of 130 Kb/d and 40 Kb/d, respectively. As discussed earlier and following the IMF's recent outlook, we estimate hydrocarbon exporting countries will have weaker recoveries than other regions, as their economic growth remains proportional to their hydrocarbon exports. Although we presume that countries such as Saudi Arabia and Russia will drive oil demand growth for these regions, at 35 Kb/d and 127 Kb/d, respectively, the remaining Eurasian countries are expected to witness declines. The Middle East, particularly countries like Iran and Lebanon, will face economic slowdowns, impeding demand growth throughout the region.

In 2022, we presume that all OECD countries except New Zealand will see oil demand growth. We assume that oil demand in the OECD Americas will reach their 2019 levels by the second half of 2023, with OECD Asia Oceania reaching theirs by the beginning of 2022. Although we expect OECD Europe to have overall demand growth of 750 Kb/d throughout 2021 and 2022, we do not expect it will reach its 2019 level of demand. This forecast reflects the region's structural declines following its

trend of diversifying away from fossil fuels and enhancing its efficiency standards. When comparing our previous forecasts with this one, we highlight that we toned down our forecast for Eastern European OECD demand growth earlier this year and have also decreased our forecast for Western Europe. Refer to our demand section on OECD Europe.

We estimate that demand for non-OECD countries in 2022 will grow at a faster pace (1.8 MMb/d) than that of OECD countries. This is because demand has slightly paused this year due to resumed lockdown measures in some countries. Hence, a stronger comeback is expected for next year; the underlying (pre-COVID-19) growth trend is also much stronger among non-OECD countries.



Source: KAPSARC, July 2021.

Note that according to the BP Statistical Review of World Energy, the largest YoY oil demand growth ever recorded was 4.1 MMb/d in 1973. We project 2021 growth to be 4.2 MMb/d. However, global oil demand levels will remain below those of 2019.

Demand levels, MMb/d

| 2020 | Q1 | Q2 | Q3 | Q4 | 2020 |
|----------------------|------|------|------|------|-------------|
| OECD | 46.2 | 40.2 | 43.3 | 43.2 | 43.2 |
| Non-OECD | 48.4 | 45.9 | 49.5 | 52.1 | 49.0 |
| Global demand | 94.6 | 86.1 | 92.8 | 95.3 | 92.2 |

| 2021 | Q1 | Q2 | Q3 | Q4 | 2021 |
|----------------------|------|------|------|------|-------------|
| OECD | 43.4 | 44.5 | 46.6 | 46.8 | 45.3 |
| Non-OECD | 49.9 | 50.7 | 51.7 | 51.7 | 51.0 |
| Global demand | 93.4 | 95.2 | 98.3 | 98.5 | 96.3 |

| 2022 | Q1 | Q2 | Q3 | Q4 | 2022 |
|----------------------|------|------|-------|-------|-------------|
| OECD | 46.8 | 46.1 | 46.9 | 47.7 | 46.9 |
| Non-OECD | 51.5 | 52.8 | 53.8 | 53.2 | 52.8 |
| Global demand | 98.3 | 98.9 | 100.7 | 100.9 | 99.7 |

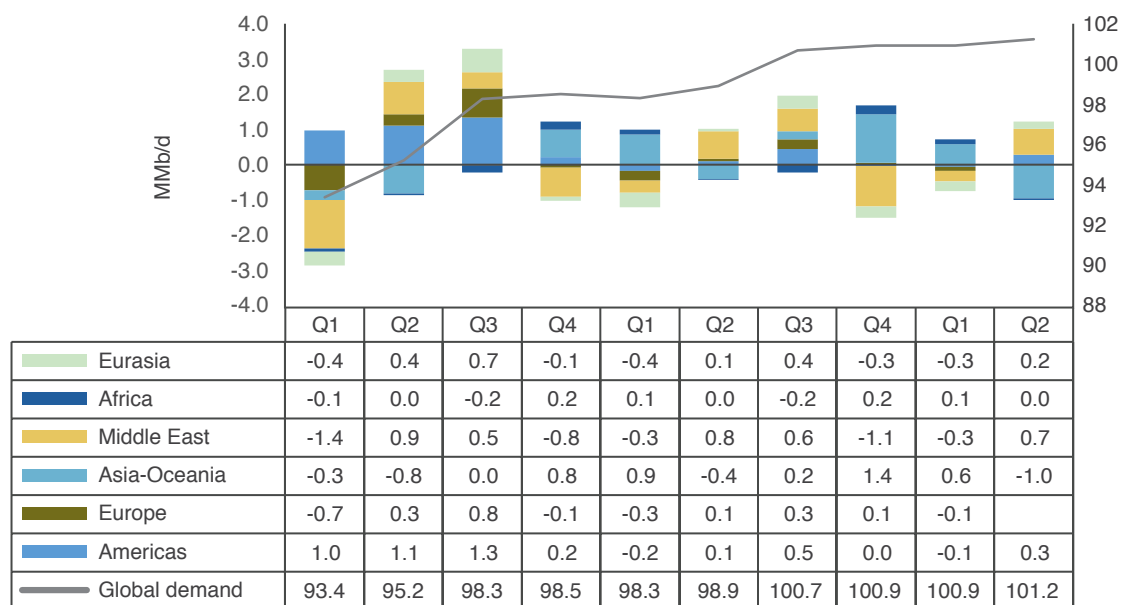
| 2023 | Q1 | Q2 |
|----------------------|-------|-------|
| OECD | 48.0 | 47.2 |
| Non-OECD | 53.0 | 54.0 |
| Global demand | 100.9 | 101.2 |

Non-OECD demand is expected to retain its 53% share of global oil demand in 2021 and 2022, as it will also account for 49% of demand growth in 2021. In 2022 it is expected to represent 55% of global demand growth as it will be facing a slower recovery in 2021 that will be regained in 2022.

As stated earlier, the largest seasonal changes this quarter are expected to come from the Americas, followed by OECD Europe and then Eurasia. This is due to the summer season and associated increases in travel.

Our current demand assumptions are susceptible to significant changes depending on the impact of the new COVID-19 variants; the effectiveness of vaccines and the speed of their distribution; the recovery in economic activity and travel; and future oil price moves. Further revisions to these assumptions will be needed as we progress through Q3 2021, particularly for the U.S. and non-OECD countries such as China. (The KOMO team remains conservative in its demand estimates and highlights that GDP recovery could create further potential for oil demand growth.)

Regional oil demand growth, MMb/d, Q1 2021 - Q2 2023



Source: KAPSARC, July 2021.

United States

| MMb/d | 2020 | Q1 | Q2 | Q3 | Q4 | 2021 | Q1 | Q2 | Q3 | Q4 | 2022 | Q1 | Q2 |
|---------------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| United States | 18.3 | 18.5 | 19.4 | 20.3 | 20.6 | 19.7 | 20.3 | 20.3 | 20.6 | 20.6 | 20.4 | 20.7 | 20.8 |

2021-2022

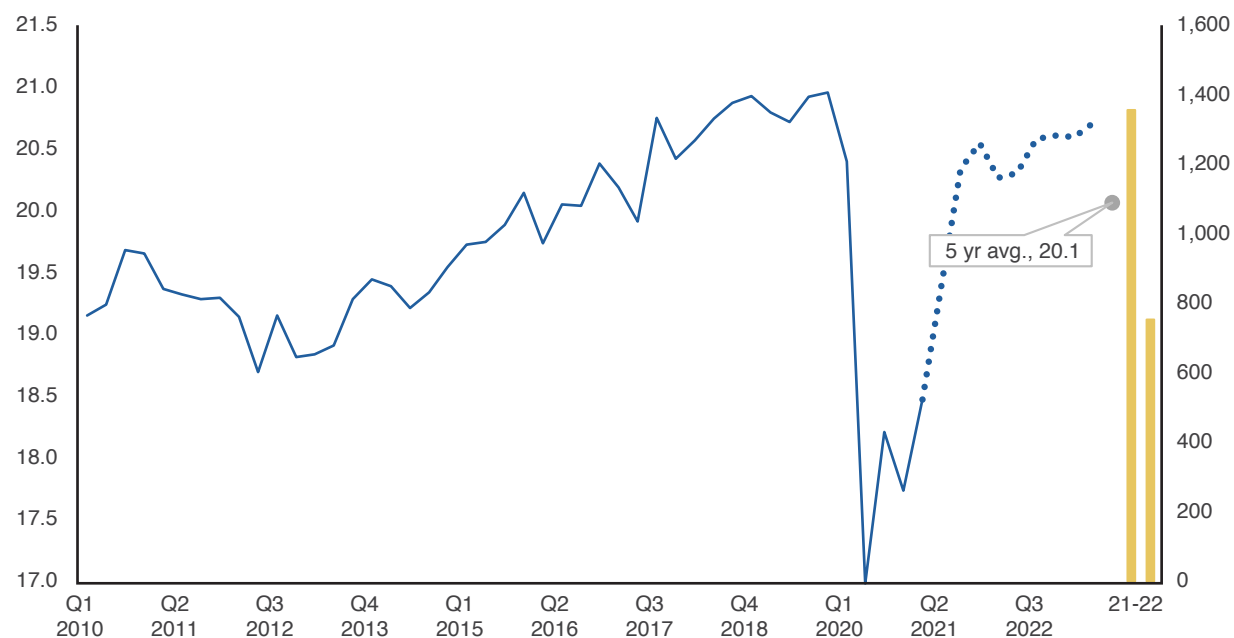
U.S. oil demand is expected to grow by around 1.35 MMb/d in 2021 and continue to grow by 750 Kb/d in 2022 while remaining below 2019 levels. This recovery would be the result of an improved economy, with estimates of a strong GDP recovery and improving unemployment rates. As such, the KOMO team revised U.S. 2021 demand growth upward by 200 Kb/d.

Just as transportation fuels were hit the hardest in 2020, they will recover the fastest in 2021. U.S. gasoline demand in 2021 should see the strongest growth (630 Kb/d), followed by gas oil/diesel (280 Kb/d), liquified petroleum gas (LPG) (160 Kb/d) and other heavy fuels, although we expect the latter to stage only a limited recovery. Our expectations for jet fuel remain bearish in 2021 at around 120 Kb/d, but 2022 looks much more optimistic as international travel increases.

Q3 2021

We expect the beginning of summer in the U.S. to cause significant QoQ demand growth of around 940 Kb/d, with the driving season increasing gasoline demand by 350 Kb/d and diesel demand at around 240 Kb/d. Recent weekly data show U.S. gasoline demand hitting 10 MMb/d for the first time. Other heavier fuels are also expected to contribute 200 Kb/d of growth.

United States, MMb/d (L) and 21-22 Growth Kb/d (R)



Source: KAPSARC, July 2021.

OECD Europe

| MMb/d | 2020 | Q1 | Q2 | Q3 | Q4 | 2021 | Q1 | Q2 | Q3 | Q4 | 2022 | Q1 | Q2 |
|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| OECD Europe | 13.1 | 12.9 | 13.3 | 14.1 | 14.0 | 13.6 | 13.7 | 13.8 | 14.0 | 14.1 | 13.9 | 14.0 | 14.1 |

2021-2022

OECD Europe's oil demand is expected to grow by 420 Kb/d in 2021 and by another 330 Kb/d in 2022. Like the U.S., OECD Europe is expected to recover much, but not all, of its lost demand from 2020. However, unlike the oil demand estimates for other OECD nations, KOMO presumes demand from this region has peaked and expects a stagnating or declining trend for OECD Europe post 2023. This edition's forecast for OECD Europe includes some significant reductions from our previous forecast for the following reasons:

1. Western European countries renewed significant lockdowns in Q1, which were expected to spill over into Q2 2021.
2. Eastern European OECD countries are disproportionately impacted by their Western neighbors, suppressing their economic recovery to a slower pace than previously presumed.
3. A strong European energy transition shift is underway, accompanied by escalating policies.

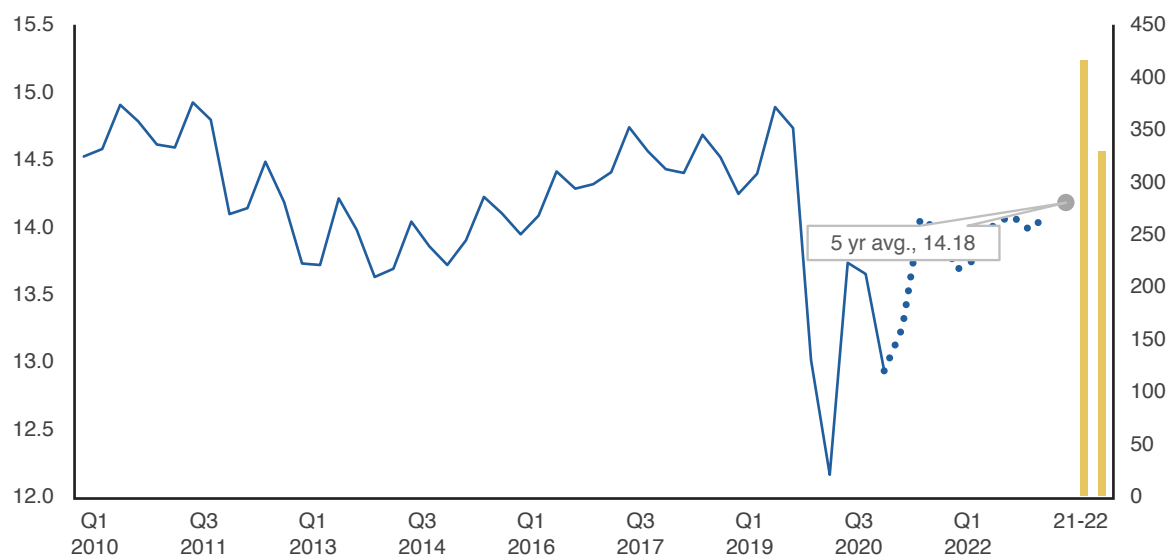
We expect a resumption of transportation activities in 2021 to drive diesel up by 190 Kb/d (45% of total growth) because much of the European fleet relies on this fuel. Gasoline demand is expected to rise by 50 Kb/d, followed by aviation and heavier fuels at around 40 Kb/d each.

Q3 2021

In line with this period, we estimate that transportation fuels will lead growth. QoQ demand in the third quarter is expected to grow by around 810 Kb/d, with diesel/

gas oil representing almost 50% of this recovery. Gasoline follows by around 170 Kb/d, with jet fuels at around 140 Kb/d.

OECD Europe, MMb/d (L) and 21-22 Growth Kb/d (R)



Source: KAPSARC, July 2021.

China

| MMb/d | 2020 | Q1 | Q2 | Q3 | Q4 | 2021 | Q1 | Q2 | Q3 | Q4 | 2022 | Q1 | Q2 |
|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| China | 13.6 | 14.6 | 14.2 | 14.3 | 14.6 | 14.5 | 14.8 | 15.1 | 14.9 | 15.3 | 15.0 | 15.2 | 15.4 |

2021-2022

China's oil demand is expected to grow by around 850 Kb/d in 2021 and by around 570 Kb/d in 2022. Economic indicators portray a strong chance for China to grow beyond our projected numbers, and demand for oil was healthy in the first half of this year. However, rising oil prices, maximized inventories and tightened government import quotas for teapots suggest a more conservative forecast for the second half of this year.

China's growth for this year is expected to come from transportation fuels. We expect diesel growth to reach 220 Kb/d, with gasoline at around 190 Kb/d; heavier fuels are also expected to be in demand this year, with an estimated growth of 140 Kb/d.

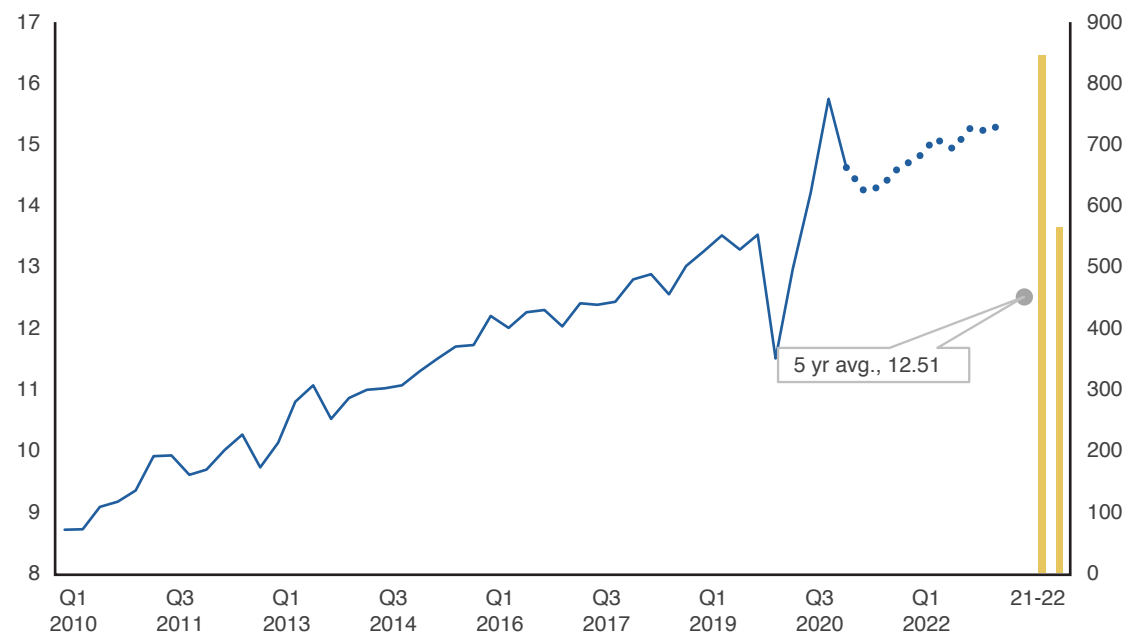
Q3 2021

China's expected demand (purchases) and consumption (usage) patterns varied significantly in the first half of this year. Although its fuel consumption was expected to be around 13-14 MMb/d, we saw demand at around 14.6 MMb/d in Q1 of this year, suggesting a large increase in inventories. However, as we moved into Q2 this year, demand seemed to have stabilized. QoQ demand is expected to rise by just 100 Kb/d. This

reflects saturation in China's inventory levels in the previous two quarters, the current regional lockdowns, rising global oil prices and a series of increases in domestic refined oil prices. The ninth increase saw domestic gasoline and diesel prices rising to 225 yuan (\$34.85) and 215 yuan per tonne in June 2021.

Gas/diesel oil growth is expected to take the lead this quarter at 170 Kb/d, followed by motor gasoline fuels with an estimated 50 Kb/d. These increments are anticipated to be counterbalanced by the declines expected in fuel oil (60 Kb/d), naphtha (50 Kb/d) and jet fuels (30 Kb/d).

China, MMb/d (L) and 21-22 Growth Kb/d (R)



Source: KAPSARC, July 2021.

India

| MMb/d | 2020 | Q1 | Q2 | Q3 | Q4 | 2021 | Q1 | Q2 | Q3 | Q4 | 2022 | Q1 | Q2 |
|-------|------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|-----|-----|
| India | 4.6 | 5.0 | 4.8 | 4.5 | 4.9 | 4.8 | 5.1 | 5.1 | 4.9 | 5.2 | 5.1 | 5.4 | 5.4 |

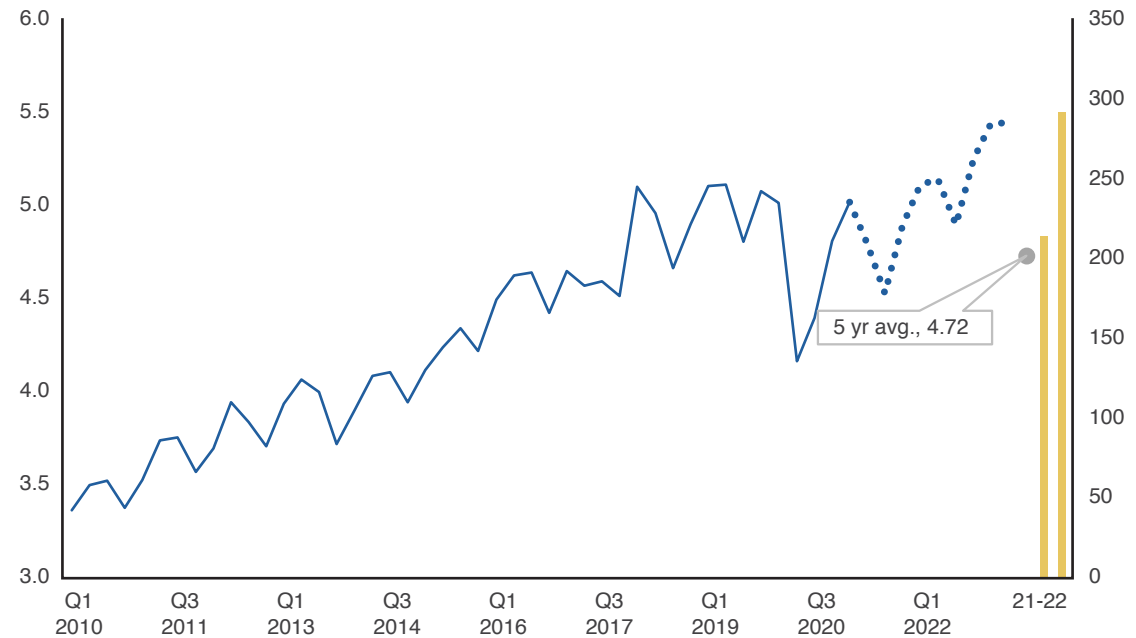
2021-2022

India's oil demand is expected to grow by around 210 Kb/d in 2021 and 290 Kb/d in 2022 (140 Kb/d less than our previous forecast for 2021 and 40 Kb/d more for 2022). To understand India's growth for this year, KOMO conducted a deep dive into several refinery company reports. Overall, there seems to be a sense of pessimism for 2021, but other indicators suggest that it is a good year for vehicle sales. Thus, we expect diesel demand to grow by 80 Kb/d and gasoline demand to be up by around 30 Kb/d. This bearish growth comes at a time when the Indian government has increased taxes across a wide array of commodities, including fuels, to shore up its revenues.

Q3 2021

QoQ India is expected to witness a demand decline of 270 Kb/d as fuel prices continue to rise while COVID-19 cases begin to stagnate. Diesel oil demand stands out, with an expected decrease of 180 Kb/d, followed by heavier fuels and naphtha at around 70Kb/d and 30 Kb/d, respectively. However, after continued declines, we expect LPG demand to start to rebound by around 50 Kb/d.

India, MMb/d (L) and 21-22 Growth Kb/d (R)



Source: KAPSARC, July 2021.

Saudi Arabia

| MMb/d | 2020 | Q1 | Q2 | Q3 | Q4 | 2021 | Q1 | Q2 | Q3 | Q4 | 2022 | Q1 | Q2 |
|--------------|------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|-----|-----|
| Saudi Arabia | 2.8 | 2.4 | 3.0 | 3.3 | 2.7 | 2.9 | 2.5 | 3.0 | 3.3 | 2.7 | 2.9 | 2.5 | 3.1 |

2021-2022

Saudi Arabia's oil demand should rebound by 35 Kb/d in 2021, then continue rising by a further 33 Kb/d in 2022.

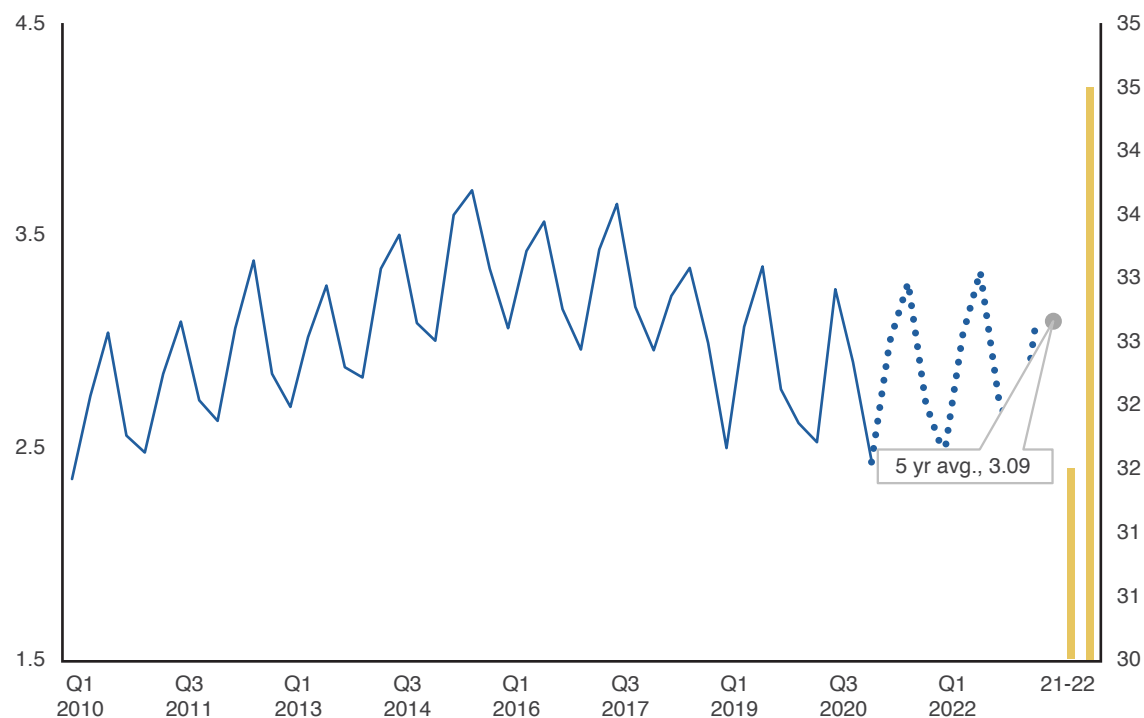
Overall, Saudi Arabia will see small demand increments for all fuels in 2021. Low oil production levels and prices have impacted the country's projected economic growth. According to the OECD's recent outlook, Saudi Arabia's GDP per capita is not expected to reach pre-pandemic levels until the beginning of 2023. Coupling this limiting factor with the 2020 VAT increase and rising fuel prices, we project modest oil demand recovery.

Q3 2021

QoQ, total oil demand is expected to grow by around 280 Kb/d. This growth accompanies Saudi Arabia's increased seasonal demand for electricity generation and the Hajj season in July.

We expect demand for fuel oil to grow by around 260 Kb/d; diesel demand growth will follow by 100 kb/d, then jet fuel by 40 Kb/d. Gasoline, however, is expected to decline slightly by around 40 Kb/d as rising fuel prices impact demand. Naphtha and LPG fuels are also expected to decline at around 40 Kb/d and 60 Kb/d, respectively.

Saudi Arabia, MMb/d (L) and 21-22 Growth Kb/d (R)



Source: KAPSARC, July 2021.

Discussion

Q2 2021 has maintained the streak of interesting quarters to analyze. As stated last quarter, “*market watchers have found predicting OPEC+ behavior difficult,*” and this quarter was no different. The added voluntary cuts in Q1 to balance the market are now giving way to large, planned supply increases. However, significant uncertainty about how they would occur caused some anxiety among traders.

High prices (~\$70 for Brent), high levels of backwardation in futures, plus uncertainty around OPEC+ cut levels make for a confusing time among producers; the only real winners are those that were already poised for production increases (Brazil, Norway, etc.). The threat of a quick Iranian return appears delayed for now, Libya’s growth is topping out, demand improvements in vaccinated nations appear to be resilient at present, and the U.S. government does not seem keen to limit pipeline capacity beyond Keystone XL; thus, some other factors have been reduced. On net, the non-OPEC+ outlook is looking better overall.

Highlights from this edition are:

- The proposed OPEC+ plan for supply increases is exactly what is needed in the short term, but risks oversupply in 2022.
- Shale is down for 2021, but 2022 could be the beginning of a long upswing if prices keep up.
- Oil sands producers can breathe a sigh of relief, as Line 3 and DAPL challenges are dismissed.
- Iran’s sanctions may not be removed as soon as originally forecast, as talks are continuing.

Last quarter’s takeaway messages were “*wait and see*” and “*don’t expect huge price movements.*” While the price is up significantly more than expected, the former statement holds true. Although uncertainty around OPEC+ plans has been reduced with a clear vision, the actual outcome depends on demand and the actions of non-OPEC+ producers. It is difficult to capture these multiple futures in a single forecast; thus, KOMO may require some scenario analysis in future publications, depending on these uncertainties.

The KOMO team built this forecast using the following core assumptions based on the stated agreements and future market balances:

1. What is currently proposed: To increase production levels collectively by OPEC+ members at 400 Kb/d per month from August 2021, plus rebasing reference production for Kuwait, Iraq, Russia, Saudi Arabia and the UAE in May 2022
2. What is assumed: To halt production levels starting January 2022 for the foreseeable future as supply/demand balances indicate surging liquids surplus beginning in Q4 of 2021.

Supply forecast

Global liquids supply is expected to grow by about 2.15 MMb/d in 2021 to reach an average of 96.4 MMb/d for the year. We expect 2022 to see a 4.97 MMb/d increase in supply, driven by demand, with an average supply of 101.3 MMb/d for the year, reaching pre-pandemic levels of over 100 MMb/d before mid-year. This represents an upward revision for growth in both years, relative to our previous outlook, of 1.2 MMb/d and 3.9 MMb/d for this year and the next. Almost all the growth this year and about 2/3 of the growth in 2022 goes to OPEC+ members. We have growth remaining flat throughout 2022, not including the adjustment in May for some OPEC+ members, because the end of 2021 pushes the average for the year to a higher level. For non-OPEC+ members, improved pricing will drive some growth, but it is difficult to compete with existing supply when it comes to volume changes.

Demand improvements (and current price increases) are partly responsible for the growth in our supply outlook; however, there are still some concerns about the impact of the COVID-19 Delta and other variants. As discussed in the demand section, the effectiveness of existing vaccines plus combination/booster options should preserve the gains we have seen, but there is lingering risk in this area.

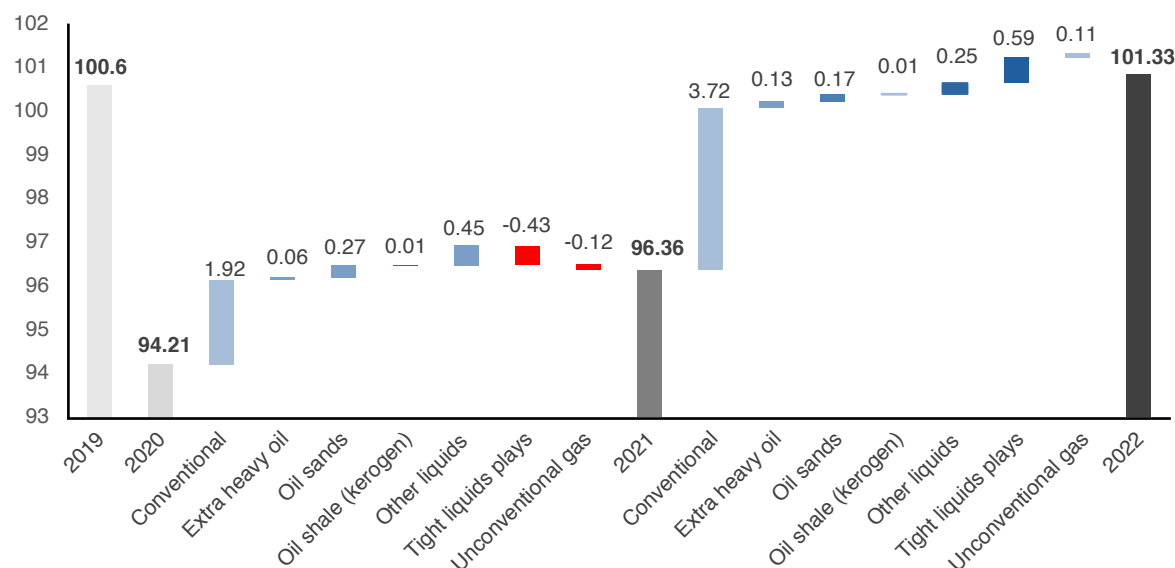
The most important topic for the oil market was the discord within the OPEC+ organization about the way forward. However, a resolution was finally reached that appears to have calmed the market's anxieties regarding potential undersupply. Prior to the final agreement, the market response was very interesting,

with prices driven up under the assumption that no increase would occur, while ignoring the danger that a deeper fragmentation of the group could release all spare capacity at once and drive down the price precipitously. The market's response, assuming that all risks were baked in, implies that a favorable result was expected, and the most likely outcome was a temporary disruption instead of a flood. The one other major risk for the group, that of Iranian production ramping up suddenly, appears less likely for the moment and is covered in our editorial for this quarter.

Outside of OPEC+, companies are responding to market conditions, with improved pricing the major determinant. July hit highs not seen since 2018 (above \$75/bbl), but this may have been a short-lived bump

while waiting for OPEC+ to increase their production by the proposed 2 MMb/d. For 2021, the usual suspects of Norway, Brazil and Canada will all increase by over 100 Kb/d, with similar gains in 2022. Interestingly, there are some gains from China (100Kb/d in 2021) and India (100 Kb/d in 2022). However, this is partly to offset recent production losses, some supply anxiety, and is a temporary blip in an overall downward trend. Shale has had a somewhat muted response so far with average production for 2021 expected to be below that of 2020; however, higher prices and signals around drilling could mean a return to growth with over 540 Kb/d in 2022. Pricing is a strong and rapid driver for shale; thus, if high prices can be sustained, there is the potential for steeper growth rates.

Annual global liquid supply, MMb/d, 2019-2022



Source: KAPSARC, July 2021.

OPEC+

Until July 18, the biggest question in the oil market was whether the members of OPEC+ would come to a consensus and continue to cooperate to balance the oil market. The finalized agreement that was reached included the original 400 Kb/d per month increase until the end of 2021. Moreover, it went further, stating that the rate of relaxation would continue at this pace until cut levels were reduced entirely. In addition, five members of the group would gain an adjusted baseline production level starting in May 2022, and the agreement to cooperate was extended until the end of 2022.

While the latest OPEC+ proposal represents a faster return to production than we anticipated in the previous edition, the outlook for demand has somewhat improved so front-loading production increases are not detrimental to the underlying market. After entering 2022, however, the underlying demand profile does not support heavy increases in production. Preventing inventories from becoming overwhelmed may require a temporary freeze that extends through the year.

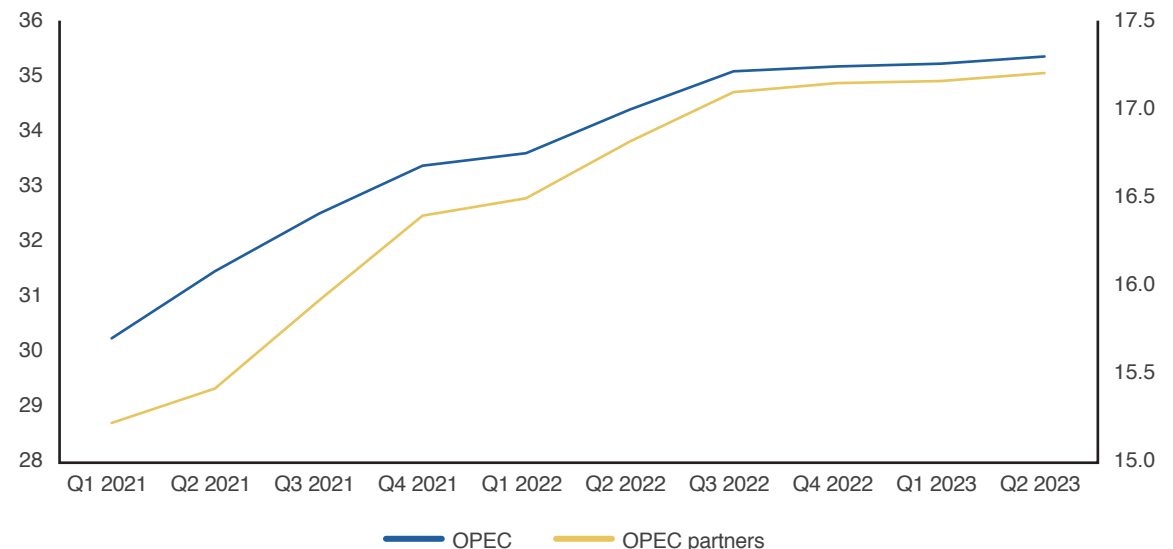
For exempt members, things have also largely stabilized. Libya is expected to regain its lost production this quarter and will essentially stabilize going forward, with small variations if the domestic situation remains calm. Venezuela has been regaining some ground from their low of under 500 Kb/d during the pandemic, but their path toward growth is very long and slow. They are not estimated to reclaim their pre-pandemic production levels (~900 Kb/d) until the end of 2023, which is still far below the highs of more than 2.5 MMb/d a decade ago.

Iran, which we cover in this quarter's editorial, is particularly interesting. Ongoing discussions about restarting the JCPOA agreement could increase production significantly. However, there are many hurdles before the U.S. and Iran can come to an agreement. For now, our outlook is relatively conservative, assuming gradually increasing levels of sanction-busting will occur, with more than 500 Kb/d added each year from 2021. This value could increase faster if an agreement is reached soon, but much of the immediate increase will be merely converting illicit production into legitimate streams, while actual production increases may need extended time to come online.

For other members, the main question is one of compliance and cohesion going forward. Adjusting baseline production levels will distribute the burden of cuts differently among the members, with some benefitting more than others. While compliance rates have been very high to date, improving prices, along with the potential for a sense of unfairness, could mean that the benefits of overproducing may outweigh the benefits of cooperation for some members.

For now, the biggest benefit of the agreement is the continued cooperation for the foreseeable future. This, along with the ongoing monthly meetings, should provide the market with confidence that it is in good hands.

OPEC production (L) and OPEC partners production (R) MMb/d



Source: KAPSARC, July 2021.

OPEC and partners supply changes for 2021 and 2022, Kb/d

| | 2021 | 2022 |
|----------------------|---------|---------|
| Mexico | (11.5) | (42.7) |
| South Sudan | 2.6 | 1.6 |
| Equatorial Guinea | (9.3) | (18.9) |
| Brunei | 13.2 | 9.0 |
| Sudan | 5.3 | 11.9 |
| Bahrain | (30.7) | (7.8) |
| Oman | 18.8 | 64.4 |
| Gabon | (8.3) | 4.3 |
| Congo | (5.7) | (2.9) |
| Malaysia | 33.4 | 17.4 |
| Azerbaijan | 25.4 | 10.8 |
| Kazakhstan | 21.4 | 37.6 |
| Algeria | 5.5 | 45.2 |
| Nigeria | (157.8) | 134.2 |
| Kuwait | (23.4) | 198.1 |
| Iran | 492.8 | 598.8 |
| Venezuela | 67.1 | 164.7 |
| UAE | (79.9) | 324.1 |
| Saudi Arabia | 148.6 | 1,006.9 |
| Iraq | (4.0) | 274.1 |
| Libya | 848.2 | (19.0) |
| Russia | 395.7 | 894.6 |
| OPEC | 1,171.5 | 2,669.4 |
| OPEC Partners | 473.6 | 997.1 |
| OPEC+ TOTAL | 1,645.1 | 3,666.5 |

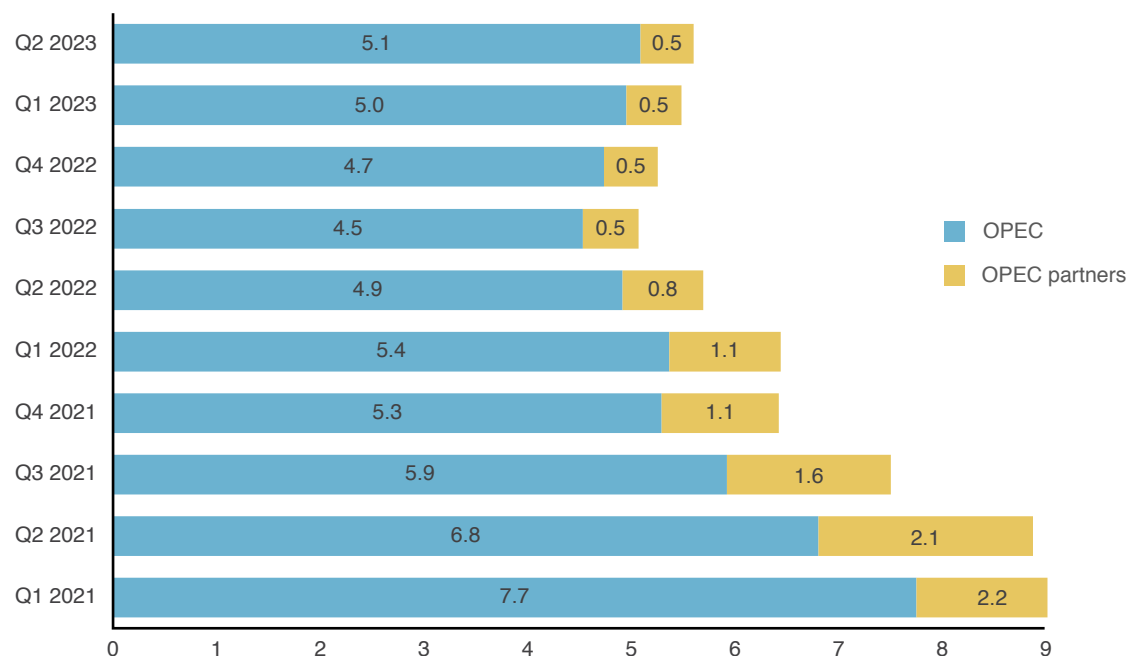
| | Kb/d |
|--|------|
| | 50 |
| | 0 |
| | -50 |
| | -100 |
| | -400 |

OPEC+ spare capacity

The dispute concerning baseline production within the OPEC+ group highlights a challenge recently discussed by the KOMO team when covering spare capacity. The underlying production capability of different producers changes over time; some shrink, while others build more. For this specific reason, we adjusted the 'Spare Capacity' definition within our model by focusing on the assumed technical capacity based on individual fields and the stated overall capacities as set out by the baselines. Under the assumptions of the scenario we present this quarter, the importance of this definition is clear to see. The large initial cuts in H2 of 2021 flatten into Q1 of 2022, and then experience another drop as the baselines are adjusted halfway through Q2. After a low in Q3 2022, spare capacity begins to inch higher again as small gains are added while production is assumed to remain mostly flat.

This is overshadowed by the possibility that spare capacity management is entirely voluntary and could fall precipitously if the group decides to push for further production increases. In addition to this, there is a 500 Kb/d capacity addition planned for Saudi Arabia, increasing the maximum sustainable capacity to 13 MMb/d, but it is undetermined when that will materialize. For now, we see that there is still significant spare capacity in the market for the foreseeable future unless demand increases at a faster rate than forecast.

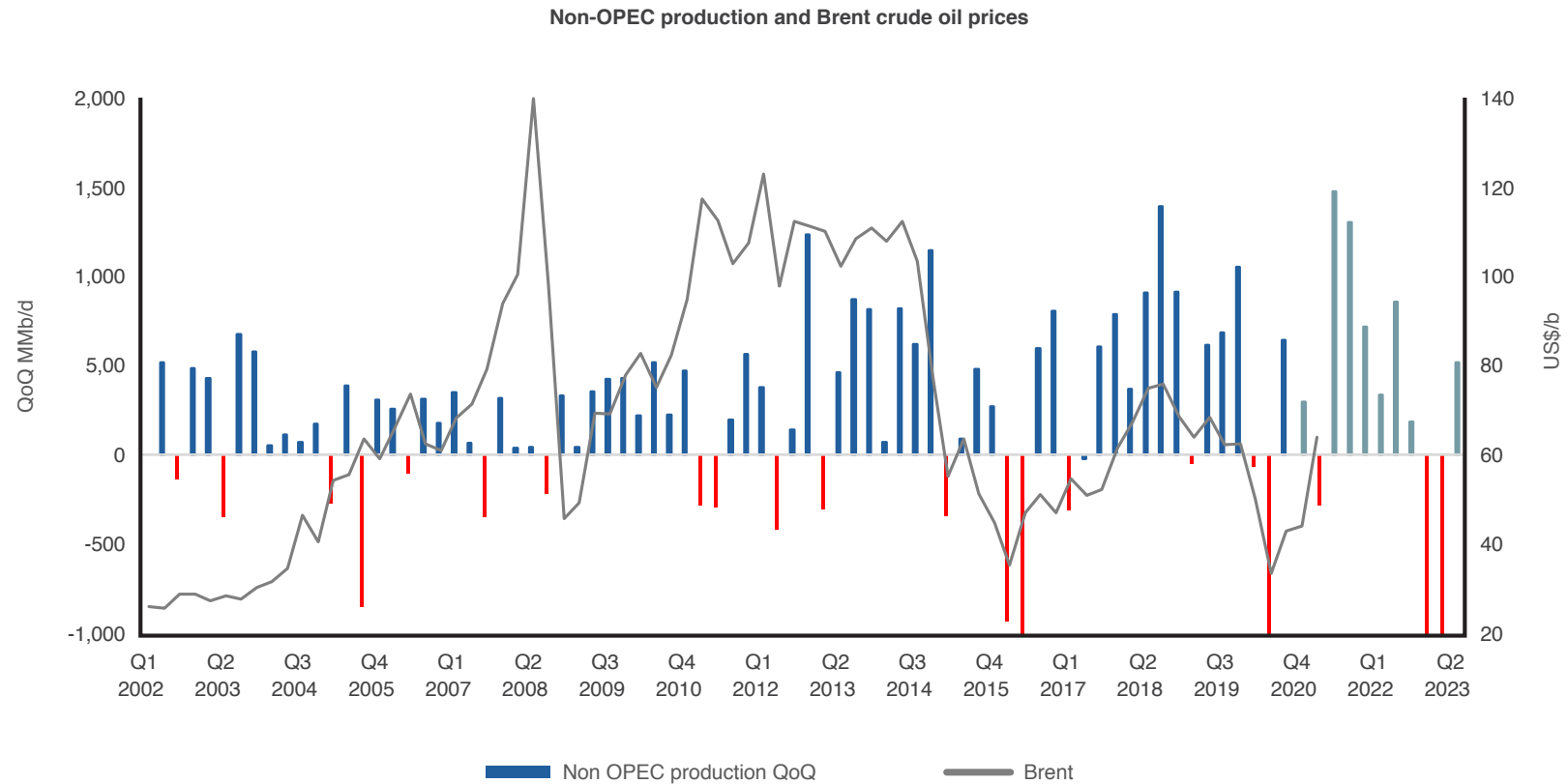
OPEC and partners spare capacity, MMb/d
Technical base



Source: Rystad; KAPSARC, July 2021.

Note: This updated definition of spare capacity is based on the technical ability of each member to produce at the current price and their stated benchmarks vs. their forecast production under the OPEC target cuts, including Saudi Arabia's stated additional spare capacity of 1.5 MMb/d.

Non-OPEC+



Sources: IEA, July 2021; KAPSARC, July 2021.

Non-OPEC+ growth:

- In 2021, the supply of tight oil is expected to fall by 430 Kb/d; unconventional gas liquids will decline by 120 Kb/d, while oil sands will reclaim 270 Kb/d.
- In 2022, the outlook for tight oil is a rebound of 590 Kb/d, with unconventional gas liquids growing by 110 Kb/d and oil sands picking up an additional 170 Kb/d of growth.
- Key features of the non-OPEC+ production story for the next eight quarters are patience and planning. Current high prices could easily falter, and policy changes could also easily turn negative in the current environment.

Non-OPEC (tight oil and oil sands)

Investments in oil have gained a significant level of long-term uncertainty, as evidenced by the pushback against some IOCs, including Shell, BP, ExxonMobil and Chevron, to reduce their carbon footprints. These players are also adjusting their portfolios to remove some high carbon intensity and long-lived assets to reduce their risk exposure. This begs the question: **If IOCs and Independents believe they are time-limited to make money from oil, will they pile into unconventional because of the shorter return on investment?**

The increased need to satisfy investors with dividends, tightening regulations, and public sentiment should indicate a muted rebound in unconventional oil production, which indeed has been the case thus far. While drilling activity has stayed relatively conservative, there has been a significant uptick in mergers and acquisitions, with lots of acreage trading hands. Meanwhile, the smaller players, especially privately held ones, are ramping up activity. While IOCs and large independents continue to espouse spending discipline, this could indicate a run-up to a major shale resurgence.

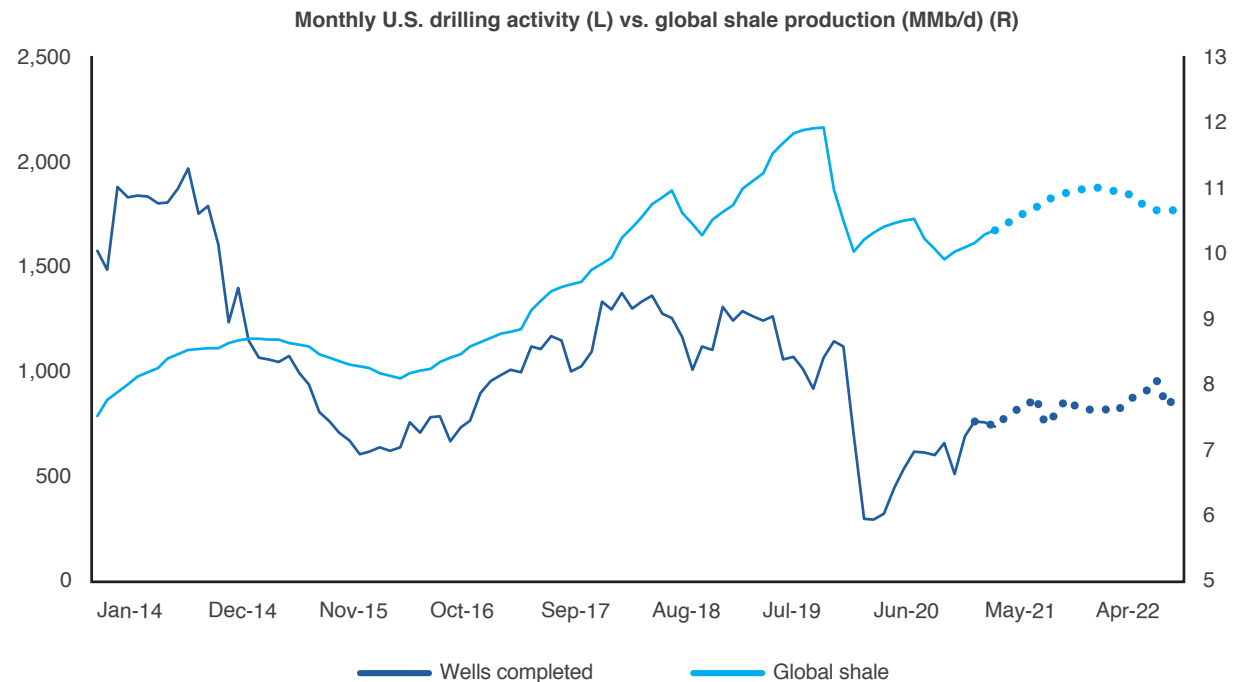
This quarter, the KOMO report estimates that U.S. shale oil production will decline in 2021 by around 470 Kb/d and rebound by 540 Kb/d in 2022. Many market forecasters are calling for a major price spike in the next few years, and shale is a key component of quickly filling market gaps. Current high prices are also testing the resolve of some companies to rein in their spending. Are these conditions creating the environment for another

market cycle like 2015-2019, with shale overshooting demand?

Amid these questions, one can only hold on to the constants. OPEC and its partners are the market's low-cost suppliers and are far more committed to maintaining supply than IOCs and unconventional; thus, their role will be critical in the short and long run. However, while COVID-19 suppresses demand, uncertainty in the market works in both directions. High prices today could become much lower overnight if

OPEC releases their spare capacity too quickly or if COVID-19 variants cause renewed shutdowns.

Because of this uncertainty and with investors remaining cautious, shale is a difficult bet to make. Right now, prices should drive significant growth, but in the next few months OPEC could ruin their party. In the medium term, market undersupply may push for much more production, but longer-term environmental policy is very discouraging. For now, it appears that shale is in for a rollercoaster.



Source: KAPSARC, July 2021.

Non-OPEC (tight oil and oil sands)

Net production for oil sands has now exceeded the pre-pandemic level, and some developments surrounding pipelines this quarter show bright spots after the revocation of the Keystone XL permit.

Opposing future pipelines is one thing; opposing in-operation pipelines at a time when prices 'at the pump' are rising is something else. The Biden administration has asked the courts to reject a challenge put forth by environmental and indigenous groups to the Enbridge Line 3 pipeline replacement project that would cross Minnesota and Wisconsin. If the project is completed on schedule later this year, it will transport 760 Kb/d and replace a much older pipeline that has been operating since 1968 and is plagued with spill and leakage problems.

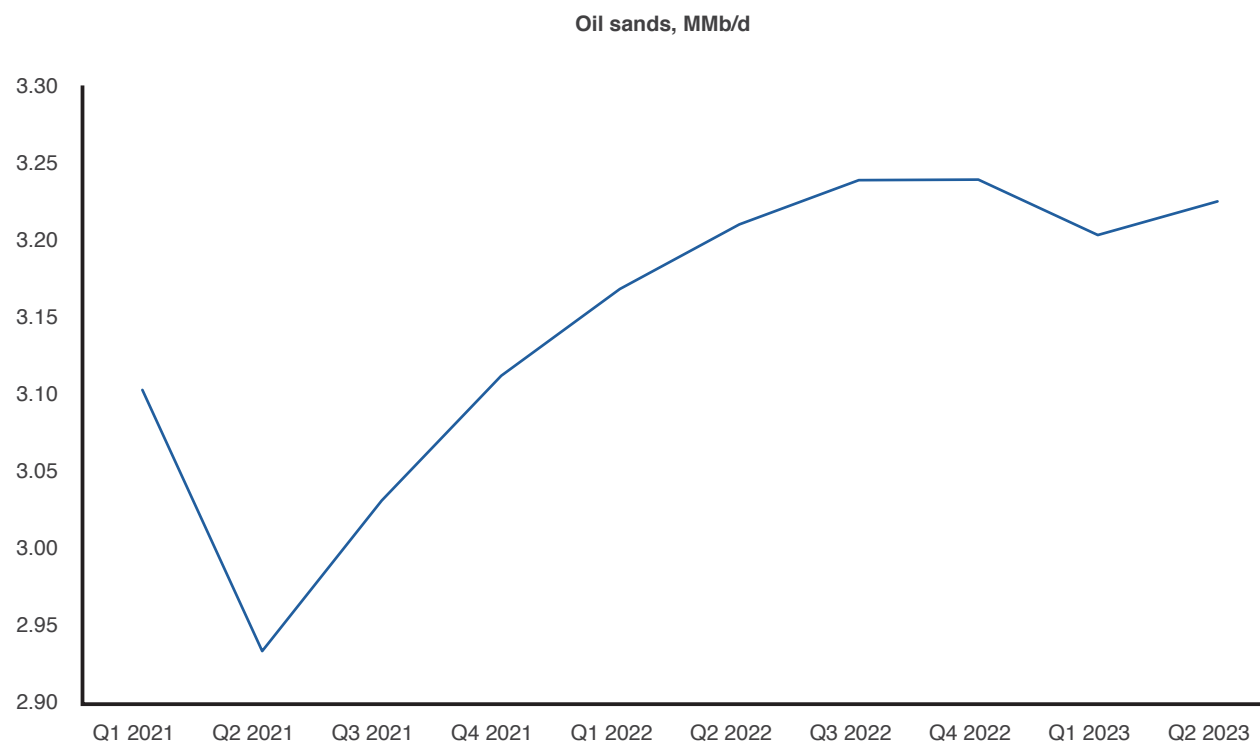
The Dakota Access Pipeline (DAPL) saw a lawsuit lodged by a local tribe dismissed, which could have disrupted the 600 Kb/d flow to Illinois from the Bakken formation in North Dakota. The excess capacity of this pipeline and the relative closeness to the Alberta tar sands offer an additional option for exports other than costly rail and could have created further transportation difficulties.

By contrast, Enbridge Line 5, the 1950s era pipeline that passes under the Great Lakes, still faces difficulties. While continuing to operate, the pipeline is now required to complete an environmental review by the Army Corps of Engineers. The pipeline pre-dates

many environmental regulations; thus, there is some question regarding the outcome of this review and how it will delay a new project designed to prevent future spills by installing a tunnel over the pipeline. So far, the Biden administration has been silent.

Oil sands output in 2021 is expected to rise by about

260 Kb/d and moderate to a slower 170 Kb/d in 2022. Compared with last quarter's forecast, this is slightly down for 2021, as the rebound from 2020 has been modulated by a lower-than-expected Q2 and the prospect of delays in constructing the Transmountain expansion. It does leave more room, however, for gradual growth going forward.



Source: KAPSARC, July 2021.

Risk scenarios July 2021

*The KOMO survey is conducted on a semi-annual basis in Q1 and Q3, with results holding over to the subsequent quarter.

KOMO's risk categories are based on current events that impact the oil industry.

KOMO uses the risk table to estimate potential impacts and considers two components: probability and impact.

Probability: A shaded chart at the top right of this slide shows the probability of a risk occurring (the darker the shade, the more likely it is to happen).

Impact: Impact is calculated as a percentage of exports (as domestic supply is often protected) or estimated into the demand model through a multiplier or a change in GDP.

For supply risks, we multiply the probability by the potential impact.

For demand risks, the model either (i) examines historical incidents as multipliers, then applies a similar response to future demand, or (ii) estimates the potential impact on GDP and channels it through the model, via changes in the exogenous variables, to determine the implications for future oil demand.

| Risk category | Item | Supply/ demand | Impact (Kb/d) | 2021 | 2022 | 2023 | 2024 | 2025 |
|-----------------------|-------------------------------------------------|-------------------|---------------|------|------|------|------|------|
| Producer supply risks | OPEC releasing more than 1 MMb/d per quarter | Supply | ↑ 200 - 400 | | | | | |
| | Libya remains exempt | Supply | ↓ 10 - 50 | | | | | |
| | Shale rebound | Supply | ↑ 0 - 100 | | | | | |
| | Lifting Iran sanctions | Supply | ↑ 20 - 140 | | | | | |
| | Biden's stringent fossil fuel policies | Supply | ↓ 100 - 220 | | | | | |
| | Major conflict | Supply | ↓ * | | | | | |
| | Brazil's production growth | Supply | ↑ 10 - 30 | | | | | |
| | Venezuela's production rebound | Supply | ↑ 20 - 80 | | | | | |
| | Oil investment growth | Supply | ↑ ** | | | | | |
| Demand risks | Prolonged economic crisis | Demand | ↓ 250 - 1500 | | | | | |
| | 50% of global population vaccinated | Demand | ↑ 220 - 1000 | | | | | |
| | Asia recovering from Delta strain | Demand | ↓ 180 - 500 | | | | | |
| | Public transport changes | Demand | ↓ 270 - 500 | | | | | |
| | OPEC return to pre-COVID-19 production levels | No | 79% | | | | | |
| | Stimulus packages continue through 2022 | Yes | 71% | | | | | |
| | Strengthening U.S. dollar | No | 71% | | | | | |
| | U.S./China trade war settlement | No | 100% | | | | | |
| | Oil prices averaging 70 \$US/bbl in 2021 - 2022 | Yes | 57% | | | | | |

The results are based on a survey conducted biannually

* Spare capacity held by OPEC+ is sufficient to cover all but the largest conflict-based oil disruptions

** Used for market insight/sentiment considerations

2021 and 2022 balances

Given the recent declaration by OPEC and its partners on the gradual increments in production levels, the market balance is expected to be at zero for 2021, and then to convert to a large surplus in 2022 at around 1.6 MMb/d.

The KOMO team forecast is based on the areas of agreement as well as the need for OPEC+ to act in a manner that minimizes further cuts by its members. Consequently, we have assumed that OPEC+ members will stick to the agreed-upon plan for July, and then increase production by 400 Kb/d, collectively, per month from August through December, halting production levels for 2022. If significant inventory increases become apparent and prices begin to weaken materially, the 'call on OPEC' to moderate the market with a 'pause' in production increases could move forward into Q4 2021.

We also assume that OPEC+ members comply with their stated cuts. This scenario is also highly contingent on the success of virus containment measures, continued economic stimulus packages, and a determination that new variants do not pose an extraordinary risk of major future waves.

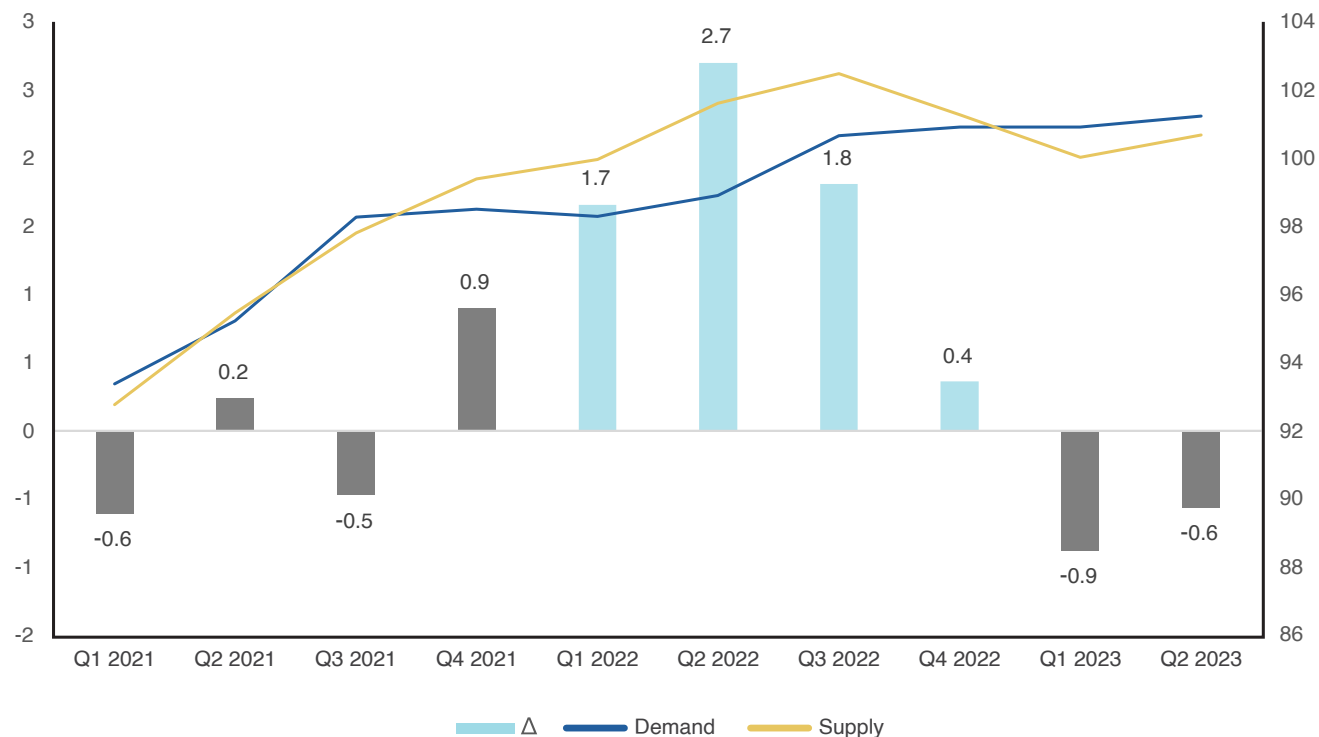
Given this scenario, we highlight an overall yearly average surplus next year that is almost three-quarters that of 2020. As the quarterly surplus for 2022 is estimated to reach a maximum of 2.7 MMb/d in Q2 2022 compared with around 6.4 MMb/d in Q2 2020,

we still see a strong need for OPEC to halt production increases throughout 2022.

As our outlook assumes continued high levels of spare capacity throughout the forecast interval, OPEC+ compliance rates are a known risk if pricing improves

and/or if fiscal realities test the resolve of some members. While the group can preemptively increase production beginning in Q3 2021 to gain market share, such a strategy may limit inventory drawdowns and depress prices.

Quarterly supply demand balance, MMb/d, Q1 2021 - Q2 2023



Source: KAPSARC, July 2021.

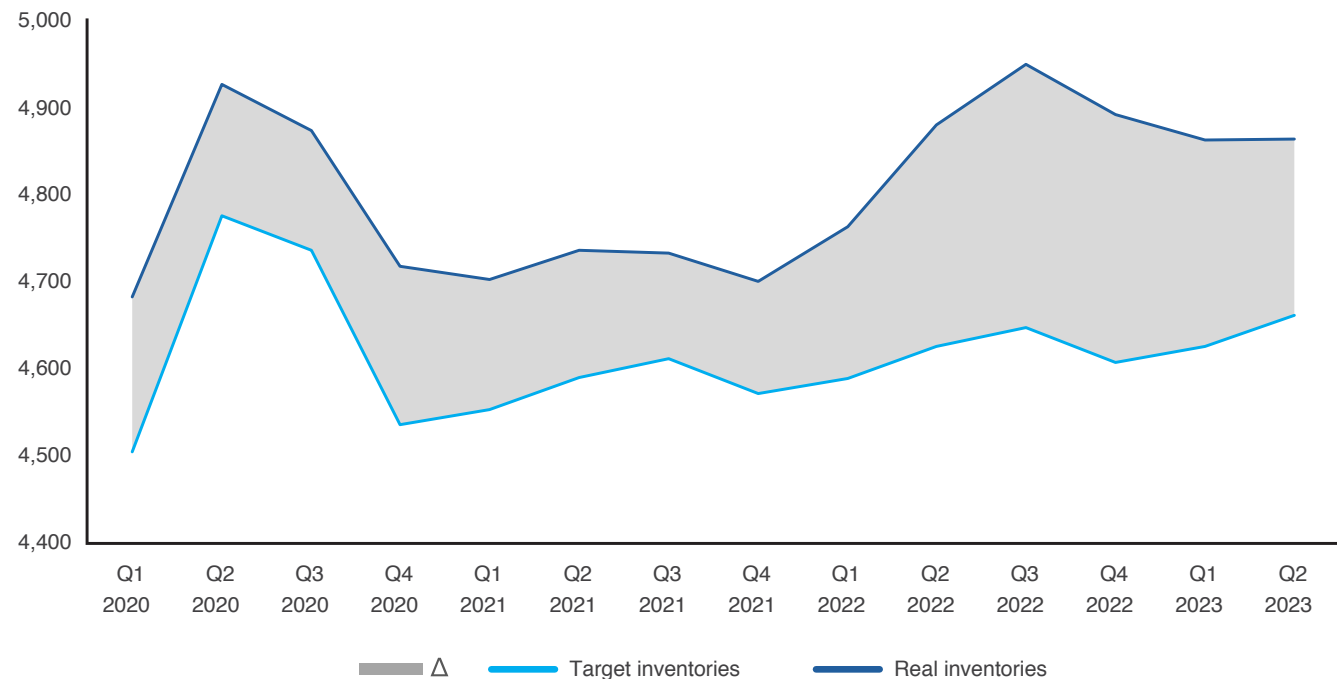
Price fundamentals (inventories)

Price movements for the foreseeable future will continue to be primarily influenced by evolving inventory levels. In this outlook, we expect real inventory levels to remain above target inventories. Indeed, if the proposed adjustments by OPEC and partners to increase production by 400 Kb/d per month are sustained through December 2021, we would expect inventories to return to saturation levels. Continued increases would create a need for OPEC and partners to reverse course and reinstate some cuts later in 2022. However, seeing the unease of some members, we find it would be challenging to reverse and cut once again. Hence, our assumption is to pause production levels for 2022.

Indeed, our assumption is an excess of liquids that is foreseen throughout the next eight quarters, but it will be maintained and will not risk overflow levels. Changes in inventory levels for the remainder of this year are relatively balanced; hence, we expect prices to remain rangebound this year or come under pressure if large inventories materialize.

The KOMO model estimates that target OECD inventories will decline by 56 MMb in 2021 and rise by 36 MMb in 2022 as we return to more normal conditions. Real inventories, on the other hand, are expected to decline by 82 MMb in 2021 (78 MMb less than our previous forecast), and then rebound by 153 MMb in 2022 as supply continues to exceed demand.

Target inventories vs. real inventories



Sources: EIA; KAPSARC, July 2021.

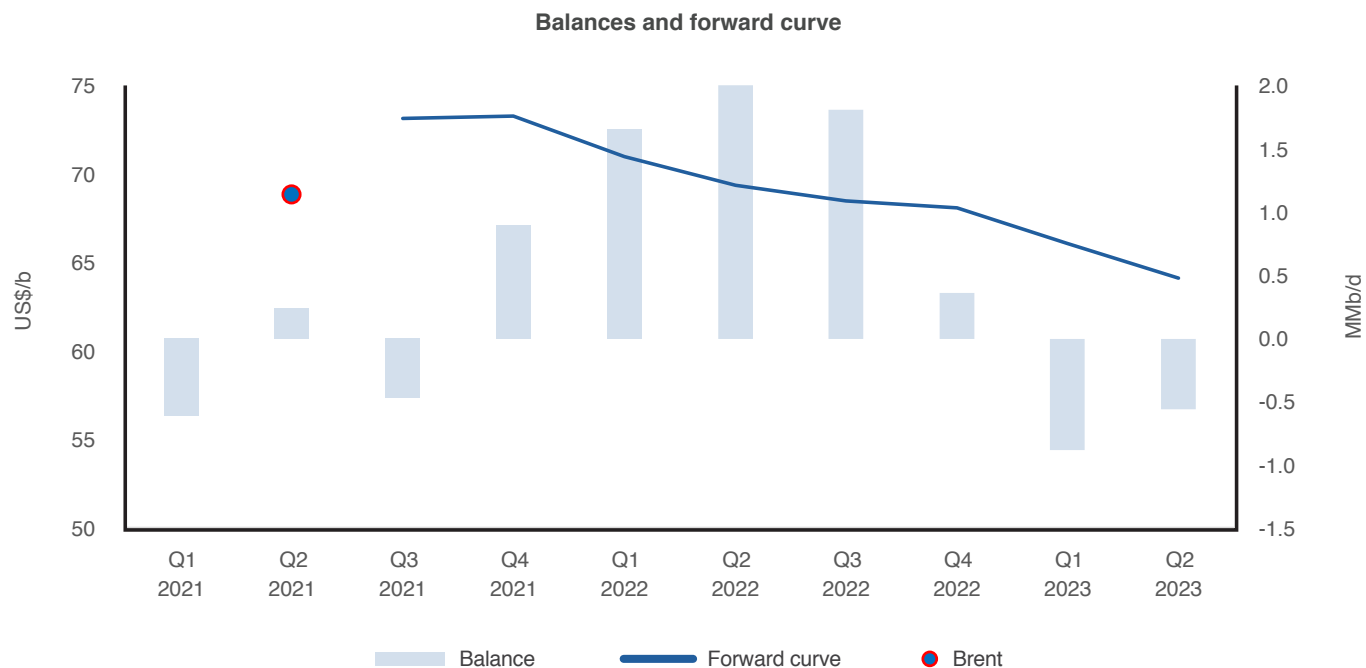
Price fundamentals (Brent)

| | Q3 2021 | Q4 2021 | Q1 2022 | Q2 2022 | Q3 2022 | Q4 2022 | Q1 2023 | Q2 2023 |
|-------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| Bloomberg | 67.08 | 67.30 | 67.07 | 66.50 | 66.72 | 66.02 | | |
| Market sentiment | 68.40 | 67.17 | 66.50 | 67.50 | 69.00 | 67.00 | 65.00 | |

| | 2021 | 2022 | 2023 |
|-------------------------|-------|-------|-------|
| Bloomberg | 66.00 | 66.00 | 65.00 |
| Market sentiment | 67.39 | 67.00 | |

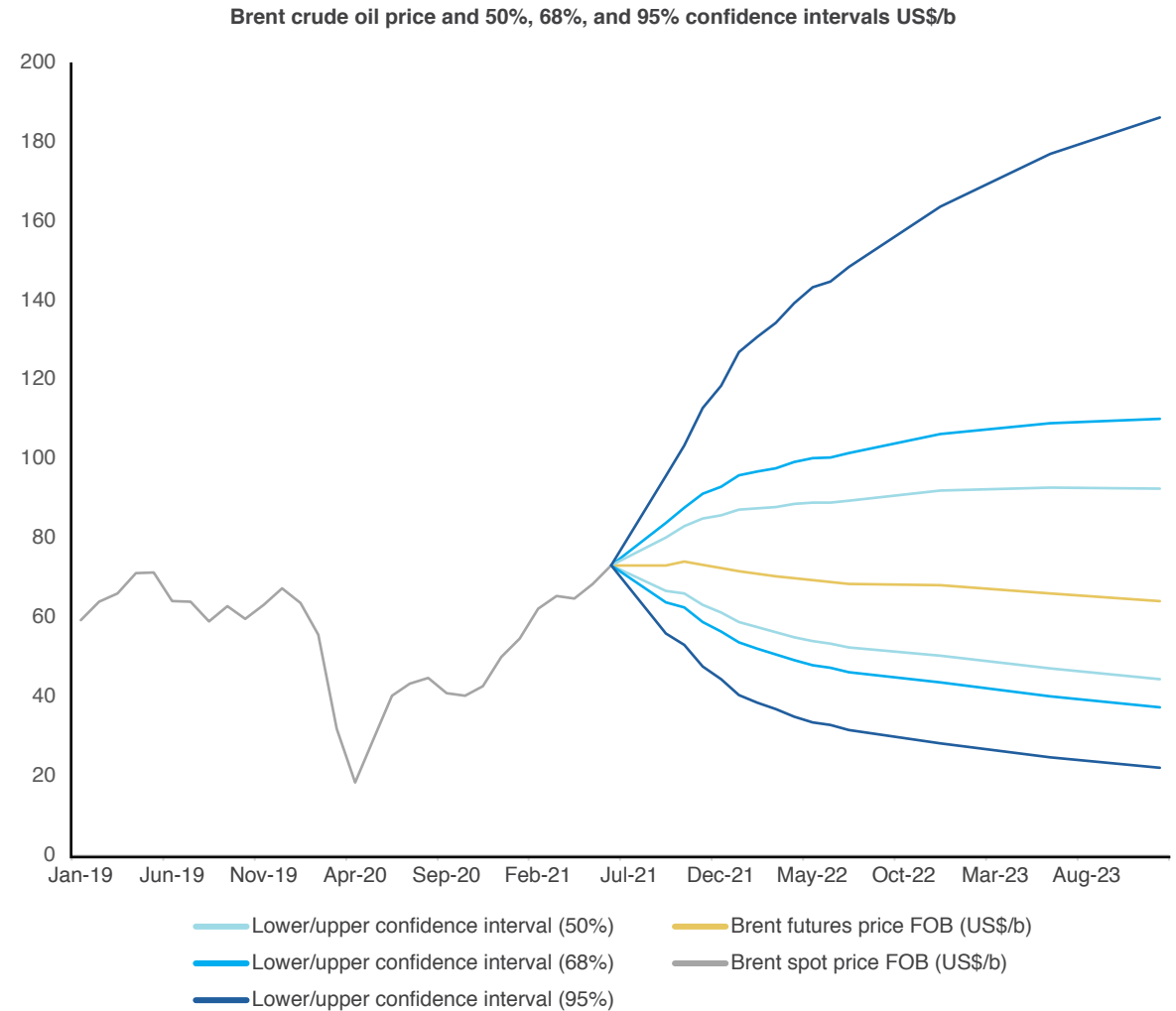
Source: Bloomberg, July 10, 2021.

*Market sentiment is based on publicly available forecast data.



Price fundamentals (forward and future curves)

The graph below depicts confidence intervals at the 50%, 68% and 95% levels derived from options market information for at-the-money options contracts.

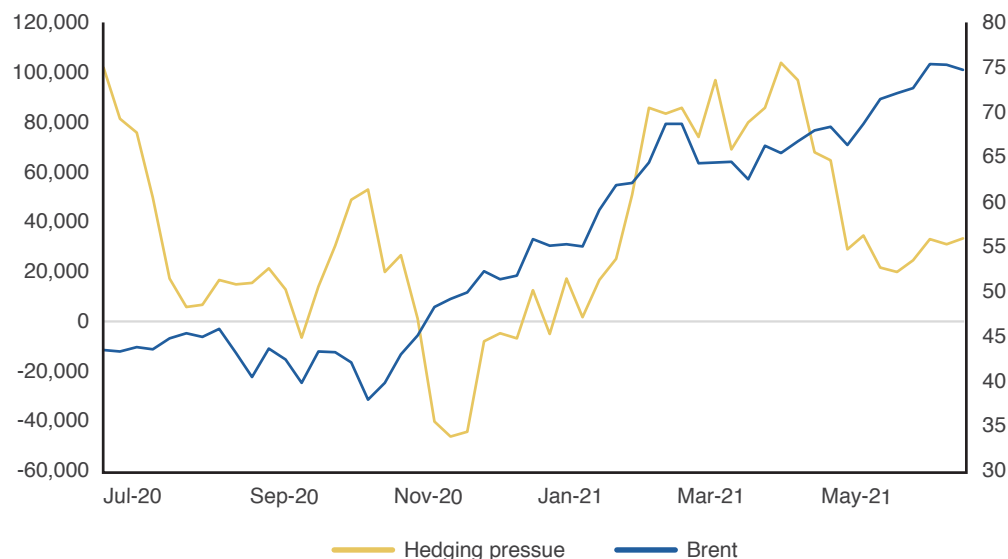


Source: KAPSARC calculations based on NYMEX data, CME Group, FINCAD, July 2021.

Price fundamentals (markets)

Hedging pressure (HP): The graph below shows the settlement price for Brent against hedging pressure, which is a measure of physical commercial (producers/merchants/processors/users) net short positions relative to net managed money long positions. It indicates a negative relationship between Brent prices and market hedgers. Given the recent summer spike in oil demand and OPEC uncertainty about increasing production, it is easy to explain the HP downward trajectory. If OPEC+ members maintain their consensus to increase production, hedging pressure would be expected to rise although prices will decline at a slower pace this quarter.

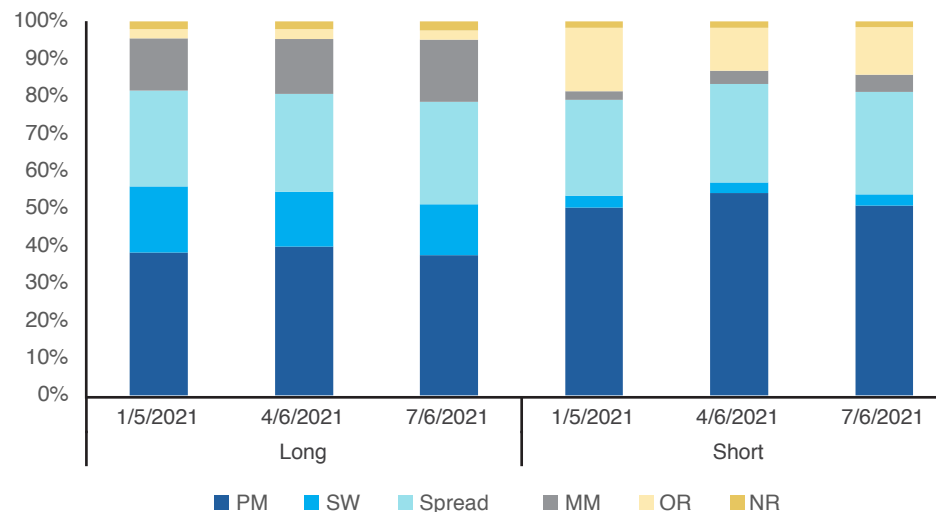
Weekly - hedging pressure (L) vs. ICE Brent price (R)



Source: Bloomberg, July 11, 2021.

Trader class shares: Despite rising oil prices throughout the year and prices exceeding 70 \$US/bbl, trader shares have been declining since the beginning of the year until now (~7% decline). However, money managers (MM) have capitalized in short positions and their numbers have almost doubled compared with earlier this year (59,179 January 5, 2021 to 108,443 July 7, 2021). This suggests that MM are optimistic about prices.

Traders class shares of longs and shorts



Source: Bloomberg, July 11, 2021. (Refer to the glossary for abbreviations).

Price fundamentals (markets)

U.S. Dollar Index: Although the U.S. Dollar Index sometimes has a negative relationship with commodity prices, Brent and the U.S. dollar have been trending upward since the beginning of this year (with April and May as an exception). This is partly fueled by an improved economic outlook for the U.S. alongside increased oil demand, which come hand in hand. Nevertheless, both producers and the Federal Reserve remain cautious about inflation; intentions to increase both production and interest rates have been signaled to lessen the impact of anticipated inflation.

Daily - US \$ index and Bloomberg Index (L) vs. ICE Brent (R)



Source: Bloomberg, July 11, 2021.

Editorial: A Tale of Three Cities, the JCPOA Revival

Contributed by Brian Efird, KAPSARC

KAPSARC has evaluated the challenges of a potential revival of the Joint Comprehensive Plan of Action (JCPOA) between the U.S. and Iran, and, if agreed, the potential terms and scope of an agreement. KAPSARC assessed the potential degree of relief from sanctions imposed on Iran, as well as accepted monitoring of the Iranian nuclear program alongside scaling back Iranian activities consistent with developing a nuclear weapon. To revive the JCPOA, an agreement is required between key decision-makers in the U.S. and Iran. However, it is influenced by stakeholders in both countries as well as facilitators from the P5+1 (i.e., the other signatories to the original deal) and regional players in the Gulf.

KAPSARC analysis, based on a game theory simulation model, found that the JCPOA talks can best be described as a tale of three cities. There are signs of agreement between the American and Iranian representatives/advisors in Vienna, in part because of negotiators' willingness to compromise and their desire to make a deal based on their personal political views.

In Washington, President Biden is expected to be held back from agreeing to additional concessions due to lack of congressional support. It is not certain that formal congressional approval of a deal is required to revive the JCPOA (this is a hotly debated point). Regardless, Biden cannot risk alienating Congress given other U.S. domestic priorities. As such, the Biden administration is expected to ultimately accept no more than a return to the original JCPOA terms on both sanctions and the Iranian nuclear program, and is more likely to try and hold out for slightly tougher conditions under a revived JCPOA.

In Tehran, Ebrahim Raisi was elected as Iranian President on June 18 to succeed Hassan Rouhani, a moderate. Raisi is by all accounts a hardliner, a protégé of Ali Khamenei, and a potential successor to Khamenei as Supreme Leader. He is widely expected to scale back the shift to more moderate politics seen in recent years and return to a more traditionalist government in Tehran. Credit for the initial agreement to the JCPOA was assigned to Rouhani, which was widely criticized by hardliners as giving up too much (and often blamed for Iran's economic woes). While Raisi is expected to keep the same foreign policy team that is supporting the talks in Vienna (including Foreign Minister Javad Zarif and Deputy Foreign Minister Abbas Araghchi), the KAPSARC simulation results indicate that neither Raisi nor Khamenei is willing to accept a return to terms that might be agreeable in Vienna. Instead, leadership in Tehran is expected to reject any outcome that approaches the original terms of the JCPOA with respect to either sanctions or the disposition of Iran's nuclear weapons program; they appear to have staked out a position that requires U.S. concessions on both aspects of any potential deal. It is likely that they intend to blame any failures on the moderate Rouhani regime.



Appendix

World oil demand, Q1 2021 - Q2 2023 (MMb/d)

| | | | 2021 | Q1 | Q2 | Q3 | Q4 | 2022 | Q1 | Q2 | Q3 | Q4 | 2023 | Q1 | Q2 | |
|-----------------------|--------------------------|-------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|--------------|-------------|--------------|--------------|-------------|
| Americas | OECD | United States | 18.3 | 18.5 | 19.4 | 20.3 | 20.6 | 19.7 | 20.3 | 20.3 | 20.6 | 20.6 | 20.4 | 20.7 | 20.8 | |
| | | Canada | 2.5 | 2.5 | 2.3 | 2.4 | 2.4 | 2.4 | 2.7 | 2.6 | 2.7 | 2.7 | 2.7 | 2.7 | 2.7 | 2.6 |
| | | Mexico | 1.7 | 1.7 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 |
| | | Chile | 0.3 | 0.3 | 0.3 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.3 | 0.4 | 0.3 | 0.4 |
| | | Total | 22.8 | 23.1 | 23.9 | 25.0 | 25.2 | 24.3 | 25.2 | 25.2 | 25.2 | 25.5 | 25.6 | 25.4 | 25.6 | 25.8 |
| | Non-OECD | Argentina | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| | | Brazil | 2.9 | 2.9 | 2.9 | 3.1 | 3.1 | 3.0 | 3.0 | 3.0 | 3.1 | 3.1 | 3.1 | 3.0 | 3.0 | 3.1 |
| | | Venezuela | 0.3 | 0.3 | 0.3 | 0.4 | 0.4 | 0.3 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| | | RO Latin America | 2.2 | 2.2 | 2.3 | 2.4 | 2.4 | 2.3 | 2.4 | 2.4 | 2.4 | 2.5 | 2.5 | 2.4 | 2.4 | 2.5 |
| | | Total | 6.0 | 5.9 | 6.3 | 6.5 | 6.5 | 6.3 | 6.3 | 6.5 | 6.5 | 6.6 | 6.6 | 6.5 | 6.4 | 6.6 |
| Total Americas | | | 28.8 | 29.0 | 30.1 | 31.5 | 31.7 | 30.6 | 31.5 | 31.6 | 32.1 | 32.1 | 31.8 | 32.1 | 32.4 | |
| Europe | OECD | Germany | 2.2 | 2.1 | 2.2 | 2.4 | 2.3 | 2.2 | 2.3 | 2.3 | 2.4 | 2.3 | 2.3 | 2.3 | 2.3 | |
| | | France | 1.6 | 1.6 | 1.6 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.8 | 1.7 |
| | | United Kingdom | 1.3 | 1.2 | 1.4 | 1.5 | 1.5 | 1.4 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| | | Poland | 0.7 | 0.6 | 0.7 | 0.7 | 0.7 | 0.7 | 0.6 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.6 | 0.7 |
| | | Turkey | 0.9 | 0.8 | 0.9 | 1.0 | 1.0 | 0.9 | 0.8 | 0.9 | 0.9 | 1.0 | 0.9 | 0.9 | 0.8 | 1.0 |
| | | RO OECD Europe | 6.5 | 6.6 | 6.6 | 6.7 | 6.7 | 6.6 | 6.7 | 6.7 | 6.7 | 6.7 | 7.0 | 6.8 | 6.9 | 6.9 |
| | Total OECD Europe | 13.1 | 12.9 | 13.3 | 14.1 | 14.0 | 13.6 | 13.7 | 13.8 | 13.8 | 14.0 | 14.1 | 13.9 | 14.0 | 14.1 | |
| Asia-Oceania | OECD | Australia | 1.0 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.2 | 1.1 | 1.2 | 1.2 | |
| | | Japan | 3.4 | 3.4 | 3.5 | 3.6 | 3.6 | 3.5 | 3.9 | 3.2 | 3.4 | 3.8 | 3.6 | 4.0 | 3.3 | |
| | | Republic of Korea | 2.4 | 2.6 | 2.4 | 2.4 | 2.6 | 2.5 | 2.6 | 2.4 | 2.4 | 2.7 | 2.5 | 2.8 | 2.5 | |
| | | New Zealand | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| | | Total | 7.0 | 7.2 | 7.1 | 7.3 | 7.4 | 7.3 | 7.7 | 6.9 | 7.1 | 7.8 | 7.4 | 8.1 | 7.1 | |
| | Non-OECD | China | 13.6 | 14.6 | 14.2 | 14.3 | 14.6 | 14.5 | 14.8 | 15.1 | 14.9 | 15.3 | 15.0 | 15.2 | 15.4 | |
| | | India | 4.6 | 5.0 | 4.8 | 4.5 | 4.9 | 4.8 | 5.1 | 5.1 | 4.9 | 5.2 | 5.1 | 5.4 | 5.4 | |
| | | Indonesia | 1.6 | 1.7 | 1.7 | 1.8 | 1.8 | 1.7 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.9 |
| | | RO Asia | 6.3 | 7.2 | 7.0 | 7.0 | 6.9 | 7.0 | 7.1 | 7.1 | 7.6 | 7.6 | 7.4 | 7.8 | 7.6 | |
| | | Total | 26.2 | 28.5 | 27.7 | 27.6 | 28.2 | 28.0 | 28.8 | 29.2 | 29.2 | 29.2 | 29.9 | 29.3 | 30.3 | 30.3 |
| Total Asia | | | 33.2 | 35.7 | 34.9 | 34.8 | 35.6 | 35.3 | 36.5 | 36.1 | 36.4 | 37.8 | 36.7 | 38.4 | 37.4 | |
| Middle East | OECD | Israel | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | |
| | Non-OECD | Bahrain | 0.1 | 0.1 | 0.0 | 0.1 | 0.1 | 0.1 | 0.1 | 0.0 | 0.1 | 0.1 | 0.1 | 0.1 | 0.0 | |
| | | Iraq* | 0.9 | 0.8 | 0.9 | 0.9 | 0.9 | 0.9 | 0.8 | 0.9 | 1.0 | 0.8 | 0.9 | 0.8 | 0.8 | |
| | | Kuwait | 0.5 | 0.4 | 0.6 | 0.7 | 0.5 | 0.5 | 0.5 | 0.6 | 0.7 | 0.5 | 0.6 | 0.4 | 0.5 | |
| | | Oman | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | |
| | | Saudi Arabia | 2.8 | 2.4 | 3.0 | 3.3 | 2.7 | 2.9 | 2.5 | 3.0 | 3.3 | 2.7 | 2.9 | 2.5 | 3.1 | |
| | | Qatar | 0.3 | 0.2 | 0.3 | 0.3 | 0.3 | 0.3 | 0.2 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.2 | 0.2 |
| | | UAE | 0.8 | 0.8 | 0.9 | 0.9 | 0.9 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.9 |
| | | Total GCC | 5.5 | 4.9 | 5.8 | 6.3 | 5.5 | 5.6 | 5.1 | 5.9 | 6.5 | 5.4 | 5.7 | 5.0 | 5.7 | |
| | | Iran | 1.8 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 1.7 | 1.7 | 1.6 | 1.6 | 1.6 | 1.7 | 1.7 | 1.7 |
| | | RO Middle East | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| | Total | 7.8 | 6.9 | 7.8 | 8.3 | 7.5 | 7.6 | 7.1 | 7.9 | 8.6 | 7.4 | 7.8 | 7.1 | 7.8 | | |
| | Total Middle East | | | 8.0 | 7.1 | 8.1 | 8.5 | 7.7 | 7.9 | 7.4 | 8.2 | 8.8 | 7.6 | 8.0 | 7.3 | 8.1 |
| Africa | Non-OECD | Egypt | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | |
| | | South Africa | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | |
| | | Other Africa | 2.4 | 2.6 | 2.5 | 2.3 | 2.5 | 2.5 | 2.7 | 2.6 | 2.4 | 2.6 | 2.6 | 2.7 | 2.7 | |
| | Total Africa | | | 3.6 | 3.7 | 3.6 | 3.4 | 3.7 | 3.6 | 3.8 | 3.8 | 3.5 | 3.8 | 3.7 | 3.9 | 3.9 |
| Eurasia | Non-OECD | Russia | 3.4 | 3.2 | 3.4 | 3.8 | 3.8 | 3.5 | 3.6 | 3.5 | 3.7 | 3.5 | 3.6 | 3.5 | 3.5 | |
| | | RO Eurasia | 2.1 | 1.8 | 1.9 | 2.1 | 2.0 | 2.0 | 1.8 | 1.9 | 2.1 | 2.0 | 2.0 | 1.8 | 2.0 | |
| | Total Eurasia | | | 5.5 | 4.9 | 5.3 | 5.9 | 5.8 | 5.5 | 5.4 | 5.5 | 5.9 | 5.5 | 5.6 | 5.3 | 5.5 |
| Global Demand | | | 92.2 | 93.4 | 95.2 | 98.3 | 98.5 | 96.3 | 98.3 | 98.9 | 100.9 | 100.8 | 99.7 | 100.7 | 101.0 | |

World oil supply, Q1 2021 - Q1 2023 (MMb/d)

| | 2021 Q1 | 2021 Q2 | 2021 Q3 | 2021 Q4 | 2022 Q1 | 2022 Q2 | 2022 Q3 | 2022 Q4 | 2023 Q1 | 2023 Q2 |
|----------------------|--------------|--------------|--------------|--------------|--------------|---------------|---------------|---------------|---------------|---------------|
| Africa | 7.45 | 7.61 | 7.77 | 7.89 | 7.89 | 7.87 | 7.81 | 7.64 | 7.45 | 7.36 |
| Americas | 31.50 | 32.78 | 33.66 | 33.85 | 34.01 | 34.51 | 34.42 | 33.23 | 32.11 | 32.65 |
| Asia | 9.34 | 9.34 | 9.32 | 9.36 | 9.39 | 9.39 | 9.36 | 9.25 | 9.10 | 9.02 |
| Eurasia | 13.39 | 13.56 | 14.07 | 14.53 | 14.63 | 14.96 | 15.23 | 15.28 | 15.29 | 15.33 |
| Europe | 4.38 | 4.33 | 4.31 | 4.32 | 4.35 | 4.39 | 4.42 | 4.44 | 4.47 | 4.50 |
| Middle East | 26.72 | 27.85 | 28.68 | 29.47 | 29.69 | 30.50 | 31.24 | 31.43 | 31.63 | 31.82 |
| Total | 92.77 | 95.46 | 97.81 | 99.41 | 99.96 | 101.61 | 102.49 | 101.27 | 100.04 | 100.68 |
| | 2021 Q1 | 2021 Q2 | 2021 Q3 | 2021 Q4 | 2022 Q1 | 2022 Q2 | 2022 Q3 | 2022 Q4 | 2023 Q1 | 2023 Q2 |
| Conventional | 67.94 | 69.85 | 71.59 | 72.91 | 73.22 | 74.28 | 75.06 | 74.59 | 73.99 | 73.86 |
| Extra heavy oil | 3.25 | 3.32 | 3.34 | 3.40 | 3.47 | 3.50 | 3.51 | 3.36 | 3.15 | 3.22 |
| Oil sands | 3.10 | 2.93 | 3.03 | 3.11 | 3.17 | 3.21 | 3.24 | 3.24 | 3.20 | 3.22 |
| Oil shale (kerogen) | 0.03 | 0.03 | 0.04 | 0.04 | 0.04 | 0.05 | 0.05 | 0.05 | 0.06 | 0.06 |
| Other liquids | 6.25 | 6.71 | 6.89 | 6.67 | 6.51 | 6.95 | 7.14 | 6.90 | 6.70 | 7.12 |
| Tight oil | 9.89 | 10.14 | 10.40 | 10.68 | 10.91 | 11.00 | 10.92 | 10.65 | 10.44 | 10.50 |
| Unconventional gas | 2.30 | 2.47 | 2.51 | 2.58 | 2.64 | 2.62 | 2.56 | 2.48 | 2.50 | 2.69 |
| Total | 92.77 | 95.46 | 97.81 | 99.41 | 99.96 | 101.61 | 102.49 | 101.27 | 100.04 | 100.68 |
| | 2021 Q1 | 2021 Q2 | 2021 Q3 | 2021 Q4 | 2022 Q1 | 2022 Q2 | 2022 Q3 | 2022 Q4 | 2023 Q1 | 2023 Q2 |
| Algeria | 0.87 | 0.90 | 0.92 | 0.95 | 0.95 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Angola | 1.11 | 1.13 | 1.15 | 1.15 | 1.13 | 1.11 | 1.09 | 1.04 | 0.99 | 0.96 |
| Congo | 0.28 | 0.28 | 0.27 | 0.27 | 0.27 | 0.27 | 0.27 | 0.27 | 0.27 | 0.27 |
| Equatorial Guinea | 0.11 | 0.12 | 0.11 | 0.10 | 0.10 | 0.09 | 0.09 | 0.08 | 0.07 | 0.06 |
| Gabon | 0.16 | 0.17 | 0.16 | 0.16 | 0.17 | 0.17 | 0.17 | 0.17 | 0.16 | 0.16 |
| Iran | 2.18 | 2.47 | 2.52 | 2.65 | 2.81 | 2.98 | 3.13 | 3.29 | 3.43 | 3.56 |
| Iraq | 3.94 | 4.01 | 4.08 | 4.22 | 4.23 | 4.32 | 4.39 | 4.40 | 4.41 | 4.42 |
| Kuwait | 2.33 | 2.39 | 2.45 | 2.53 | 2.53 | 2.61 | 2.68 | 2.68 | 2.68 | 2.68 |
| Libya | 1.18 | 1.17 | 1.25 | 1.25 | 1.20 | 1.19 | 1.19 | 1.19 | 1.20 | 1.20 |
| Nigeria | 1.31 | 1.35 | 1.40 | 1.46 | 1.51 | 1.54 | 1.53 | 1.48 | 1.40 | 1.37 |
| Saudi Arabia | 8.36 | 9.00 | 9.60 | 9.92 | 9.92 | 10.17 | 10.41 | 10.41 | 10.41 | 10.41 |
| UAE | 2.61 | 2.68 | 2.77 | 2.86 | 2.86 | 3.02 | 3.17 | 3.17 | 3.17 | 3.17 |
| Venezuela | 0.52 | 0.52 | 0.60 | 0.65 | 0.69 | 0.73 | 0.75 | 0.77 | 0.78 | 0.79 |
| Oil field production | 24.96 | 26.19 | 27.27 | 28.16 | 28.38 | 29.16 | 29.83 | 29.89 | 29.92 | 30.00 |
| Other production | 5.27 | 5.26 | 5.22 | 5.21 | 5.21 | 5.23 | 5.25 | 5.28 | 5.31 | 5.36 |
| OPEC | 30.23 | 31.45 | 32.49 | 33.37 | 33.59 | 34.38 | 35.08 | 35.17 | 35.23 | 35.35 |
| | 2021 Q1 | 2021 Q2 | 2021 Q3 | 2021 Q4 | 2022 Q1 | 2022 Q2 | 2022 Q3 | 2022 Q4 | 2023 Q1 | 2023 Q2 |
| Call on OPEC | 30.84 | 31.20 | 32.96 | 32.47 | 31.93 | 31.68 | 33.27 | 34.80 | 36.11 | 35.91 |
| OPEC | 30.23 | 31.45 | 32.49 | 33.37 | 33.59 | 34.38 | 35.08 | 35.17 | 35.23 | 35.35 |
| OPEC Partner | 15.22 | 15.41 | 15.91 | 16.40 | 16.49 | 16.82 | 17.09 | 17.15 | 17.16 | 17.20 |
| Non-OPEC | 47.32 | 48.60 | 49.40 | 49.64 | 49.88 | 50.41 | 50.31 | 48.96 | 47.65 | 48.12 |
| Total | 92.77 | 95.46 | 97.81 | 99.41 | 99.96 | 101.61 | 102.49 | 101.27 | 100.04 | 100.68 |

Glossary

| | |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MMb/d | Million barrels of oil per day |
| Kb/d | Thousand barrels of oil per day |
| Target inventories | A theoretical construct reflecting the aggregated 'normal' level of inventories desired by the oil industry to meet contractual obligations, provide a cushion for the complex supply chain that tends to deliver the product in batches, and buffer unanticipated changes in the supply of and demand for crude oil. It is derived from OECD inventory data using a trend component reflecting long-term economic growth, and a seasonal component reflecting phenomena such as the winter heating season, and summer driving and cooling seasons. |
| Real inventories | Represents the real inventory levels based on KOMO's forecast of supply/demand and inventory surplus/deficit balances. |
| Hedging pressure | <p>HP = PMnS – MMnL, where PMnS is producer/merchant/processor/user net short, and MMnL is managed money net long.</p> <p>Note that HP is always positive, meaning that managed money net longs are insufficient to meet all of the desired hedging of the PM traders. Also, a negative relationship between price and HP is expected. This is because as HP increases, there is expected to be downward pressure on price: more shorts seeking counterbalancing longs will put downward pressure on the price. The increased hedging pressure costs the short hedgers more because they have to accept lower prices.</p> |
| PM | Producers/merchants/processors/users |
| SW | Swap dealers |
| MM | Managed money |
| OR | Other reporters |
| NR | Non-reporters |
| OPEC partners | Azerbaijan, Bahrain, Brunei, Kazakhstan, Malaysia, Mexico, Oman, Russia, South Sudan and Sudan |

About KAPSARC

The King Abdullah Petroleum Studies and Research Center (KAPSARC) is a non-profit global institution dedicated to independent research into energy economics, policy, technology and the environment across all types of energy. KAPSARC's mandate is to advance the understanding of energy challenges and opportunities facing the world today and tomorrow, through unbiased, independent, and high-caliber research for the benefit of society. KAPSARC is located in Riyadh, Saudi Arabia.



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KOMO usually uses the IMF’s GDP forecasts. However, due to the timing of this publication, Oxford Economics’ GDP forecast numbers were used, rather than those of the IMF.

Information as of July 2021 was used in the preparation of this Report.



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