



مركز الملك عبدالله للدراسات والبحوث البترولية
King Abdullah Petroleum Studies and Research Center



KAPSARC Oil Market Outlook (KOMO)

Q2, 2021

Summary

Total global oil demand is expected to increase year-on-year (YoY) by 4.3 million barrels per day (MMb/d) in 2021 to 96.3 MMb/d. It is expected to further grow by 3.2 MMb/d in 2022 (300,000 barrels per day [Kb/d] less than our January Q1 2021 outlook for 2022), returning to 2019 levels by Q3 2022. Our oil demand growth projections are less optimistic than the International Energy Agency (IEA), OPEC and the Energy Information Administration (EIA).

We consider the drop in 2020 to be less than other forecasts, and this has been reported/explained in previous KOMO quarterly publications. Couple this with continued reported numbers of high cases of infections and, hence, we expect growth in 2021 to be more modest than other forecasts.

There is some variation between the different forecasts on the aggregate level, but the percentage growth rates are roughly similar, ranging between 57%-61% for 2021.

Although 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, and the OECD in its March outlook revised its decline in GDP to -3.4% for 2020 and revised its growth in 2021 to 5.6%, we remain cautious given the recent lockdown measures and rising cases in March and April 2021. We also remain cognizant that the rollout of vaccines has been delayed, and some currently available vaccines have been less effective against certain variants of the virus. As a result, we continue to estimate a forecast more in line with the previous OECD outlook (4.2% growth) that presumed GDP would only reach 2019 levels by the end of 2021. The expectation of GDP growth in 2021 assumes that economic activity continues to recover and that vaccine availability and herd immunity will allow the recovery to continue with a risk of small lockdown measures (i.e., limited regional or city lockdowns or shorter closure periods) as we move forward. These assumptions, coupled with a slower rollout of vaccines in some developing countries, point to reduced oil demand.

The yearly average economic recoveries of many OECD countries, particularly Europe, as well as non-OECD countries in the Middle East, Eurasia, Africa, and Latin America, are expected to take longer than the United States (U.S.) and Asian countries. Asia is expected to lead the rebound in regional oil demand in 2021, while the U.S. is expected to have the largest growth amongst all single countries, at around 1.15 MMb/d. China had an average demand in 2020 of 13.5 MMb/d, with demand in Q4 2020 of 15.6 MMb/d the most notable, and this was due to the government's relaxation of import restrictions for both teapot refiners and oil traders. We expect Chinese demand to have returned to normality in Q1 2021, at around 14.9 MMb/d and 14.6 MMb/d in Q2. Over 1.4 MMb/d of this demand is expected to go into inventories in Q1 2021, but we see Chinese demand stabilizing in Q2 as inventories continue to pile up.

These projections remain highly contingent on the success of virus containment measures and the continuation of economic stimulus packages. We assume that the pandemic (including the new COVID-19 variants) is largely brought under control by the end of Q2 2021 without any further major waves of infection. Q2 2021

Summary continued...

should witness significant quarter-on-quarter (QoQ) demand growth of 1.9 MMb/d, a significant upgrade from Q1 2021. Although the Q2 2021 estimate of 95.8 MMb/d of demand remains below 2019 levels, it is still 10 MMb/d (YoY) higher than the depths of the 2020 crisis when global demand plummeted due to lockdown measures.

This quarter's demand highlights:

The drivers of this quarter's significant demand growth will be continued economic recovery and seasonal consumption patterns. We anticipate the most significant QoQ growth will come from the U.S. followed by the Middle East, particularly Saudi Arabia's seasonal growth. We expect growth of around 800 Kb/d in the U.S. and 600 Kb/d in the Kingdom, respectively.

Overall, all regions are expected to witness QoQ growth in Q2 2021, except for Asia where we expect demand to decline by around 400 Kb/d. China is expected to lead these declines, as the saturation of its inventories has reduced its demand for oil. We expect the second-highest demand decline to come from South Korea, in line with its natural seasonal demand.

Total global oil supply is expected to grow by 1 MMb/d in 2021, with a stronger recovery of 3.4 MMb/d in 2022 (400 Kb/d higher than our previous forecast in January 2021). We expect OPEC+ members to carry most of the rebound in 2021, as increased supply will likely not be driven by new projects but by ramping up existing production capacity. The 15th OPEC and Non-OPEC Ministerial Meeting, held in April 2021, agreed to increase production by no more than 500 Kb/d a month, with preliminary adjustments for May, June and July 2021 set at 350 Kb/d, 350 Kb/d and 450 Kb/d, respectively. The KOMO team expects that OPEC+ production (all liquids) will grow this quarter by around 700 Kb/d and around 1.4 MMb/d in Q3 2021, including the planned reduction in Saudi Arabia's additional voluntary cuts (based on the assumption that OPEC+ July targets remain in place throughout Q3 2021). The relaxation of production is expected to follow suit in Q4 2021 by around 500 Kb/d before halting in Q1 2022. We expect this to reverse temporarily as the winter season reduces demand growth and OPEC+ members focus on maintaining inventory deficits to reach 'normal' pre-pandemic five-year average levels.

While there is 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. U.S. shale production is expected to continue to decline by 220 Kb/d YoY in 2021, and we forecast growth of around 700-800 Kb/d for 2022. However, this forecast is dependent on the continued recovery of drilling operations to combat the ever-present decline rates and the recent harsh winter in Texas.

These supply/demand trends suggest an average global withdrawal of 1.1 MMb/d from global inventories in 2021, and a further 800 Kb/d in 2022, with quarterly declines for the next eight quarters ranging between 0.1-1.9 MMb/d. We again note that the current 2021 balance outlook assumes that OPEC+ members will increase production at a gradual rate, the vaccination programs allow for further economic recovery, AND the spread of the new COVID-19 variants are controlled by the end of Q2 2021 with no major 'new' waves post-Q2 2021.

Based on the projected imbalances in 2021, we assume OPEC+ may face some challenges over the next eight quarters. The winter of 2021/2022 risks an oil surplus due to a seasonal demand decline and a modest non-OPEC+ supply recovery. OPEC+ may be required to make a temporary cut of 500 Kb/d in Q1 2022 to keep price/withdrawals steady. Assuming this slight adjustment is made, the market can maintain a deficit of around 100 Kb/d from Q1 2021 through Q2 2022. Slow and measured easing over the next four quarters can keep the market stable and will see more capacity for increases in production from summer 2022. The prospect for continued inventory withdrawals beyond mid-2022 may give OPEC+ members headroom for even greater production increases later in the forecast interval without jeopardizing prices. As always, OPEC+ compliance rates will be a significant factor driving production if pricing improves and fiscal realities test the resolve of some members.

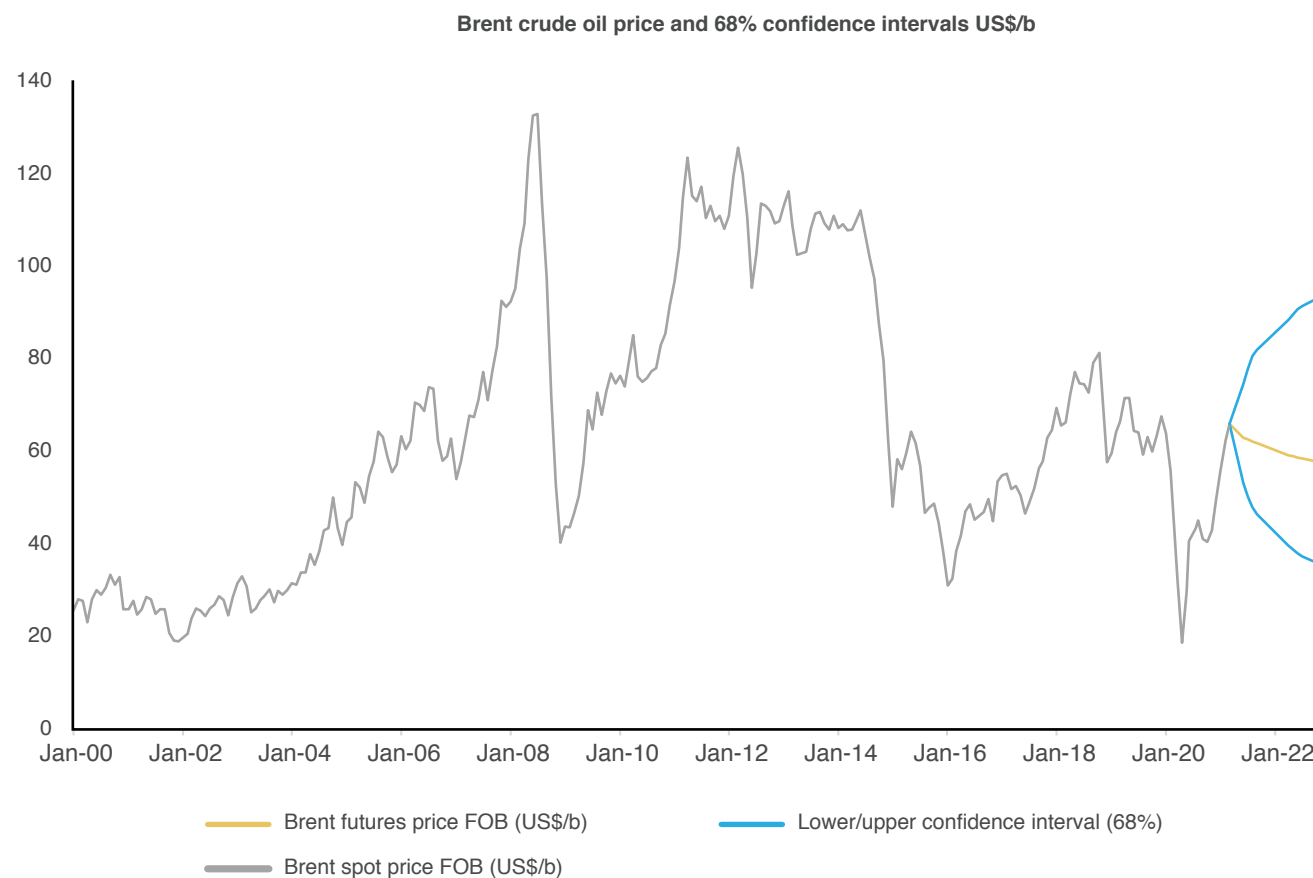
Under these assumptions, target inventory levels for the OECD are expected to decline by 56 MMb to 4,579 MMb in 2021 and increase by 36 MMb in 2022. Actual inventory levels are expected to reach 4,664 MMb in 2021 and further decline by 108 MMb in 2022, falling below target levels by Q1 2022 and creating an environment conducive for prices to stabilize.

Note: Although OECD inventories are used as an indicator and are presumed to reach their five-year average, they do not depict a holistic picture of global inventories. This indicator does not inherently reflect the extent of the role of OPEC+ in helping to manage these inventories.

	2019	2020	Growth	2021	Growth	2022	Growth
Demand	99.5	92.0	-7.51	96.3	4.30	99.4	3.17
Supply	100.6	94.2	-6.45	95.2	1.03	98.6	3.40
Δ	1.2	2.2		-1.1		-0.8	

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, April 2021.

US\$/b	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023
Futures	\$62.74	\$61.91	\$60.63	\$59.52	\$ 58.67	\$58.19	\$57.16	\$56.26
50% CI	\$55 - \$70	\$53 - \$72	\$49 - \$75	\$46 - \$77	\$44 - \$78	\$42 - \$78	\$40 - \$79	\$38 - \$82
68% CI	\$53 - \$74	\$48 - \$80	\$44 - \$84	\$41 - \$86	\$38 - \$89	\$37 - \$91	\$35 - \$93	\$32 - \$99
95% CI	\$45 - \$87	\$37 - \$102	\$32 - \$115	\$28 - \$125	\$26 - \$134	\$24 - \$141	\$21 - \$151	\$18 - \$172

Note: CI = confidence interval

Key issues for the oil market in 2021 and 2022

For a better understanding of what to expect in 2021, KOMO assumes that OPEC+ aims to maintain a modest deficit throughout the next eight quarters. The main revision to the KOMO forecast since January 2021 has centered around renewed lockdowns that were not factored into prior assumptions. In the last few months, news reports of extended lockdown measures and rising numbers of COVID-19 cases in key countries have re-emerged and required an adjustment to our forecast. Compounding this are the delayed vaccine rollouts in both the European Union (EU) and developing countries, and the reduced effectiveness of some vaccines against new variants. There is thus a reasonable expectation of further downward revisions to this year's economic outlook if we continue to witness prolonged periods of lockdown measures and/or a slower rollout of the vaccine. This could result in third waves in several countries. Nevertheless, the consensus amongst all forecasters is that 2021 will be much better economically than 2020 and should witness significant economic and oil demand growth. Based on this broad market view, we stick to our existing assumption that global average GDP will reach pre-COVID-19 levels by the end of 2021.

Developing countries appear to be leading the oil demand rebound, while many OECD members will only reach their pre-COVID-19 oil demand levels in 2022. This trend extends beyond the OECD, with hydrocarbon and service-oriented nations also negatively impacted

by a slower recovery. Lower demand and lower oil revenues are responsible for the impact on producers, but the service economies are more directly shaped by the sluggish return of travel and free movement. Even with supportive fiscal and monetary policies, differing economic structures will mean varying recoveries among nations. While it is difficult to account for all the changing variables in one forecast, governments and other market players can significantly improve the economic situation with continued support for stimulus packages, managing geopolitical issues, and providing clear long-term objectives.

Our forecast may change further, as the new COVID-19 variants have proven to be more contagious than expected. In our previous publication we note that *“further viral evolution may render the current vaccines less potent. If this scenario takes place, then we would face another wave of quarantine measures and OPEC+ may need to maintain cuts for a longer period.”* **This is exactly what has happened.** In fact, given the recent revisions to our oil demand growth forecast, which reflects the recent lockdown measures, and because many Asian emerging economies have already shown some oil demand recovery during Q3 and Q4 of 2020, we expect overall demand in 2020 to have increased by 200 Kb/d and, as a result, the demand curve has shifted upward for 2021. However, we have revised our projections downward for 2021 (-40 Kb/d) and 2022 (-300 Kb/d). Hence, demand is not expected to

reach 2019 levels this year, whether or not a third wave occurs in multiple countries this year.

KOMO's assumptions last year were more optimistic and expected air travel to resume by Q4 2020. However, this has not been the case to date, indicating a slower recovery, particularly in the services sector, such as discretionary consumer spending and travel.

- The IMF forecasts that global GDP for 2020 has 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 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.”* Consequently, we are adopting a more conservative assumption for global economic growth for 2021.
- Fiscal stimulus package distributions are expected to play an important role in supporting consumers, businesses, and the banking system against the backdrop of COVID-19. Couple this with the

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

uncertainty surrounding negative, or low, short-term interest rates in many OECD countries, and there is an indication of a modest recovery.

- Geopolitical tensions were expected to subside on many fronts, with Iran expecting an easing of its sanctions, China reaching out to resume talks with the U.S. and having a more diplomatic tone in its relations with all countries. But this has not been the case so far, and we expect slow but gradual developments.

On the supply side, OPEC+ compliance has remained high, and the market, while still shaky, is much less volatile than earlier in the year. The much-hoped-for 'V'-shaped recovery in U.S. production has not occurred, and shale continues to feel the pinch, with accelerating financial difficulties on top of the recent weather disturbances.

Global supply in Q2 2021 is expected to increase faster than Q1 by around 1 MMb/d, largely driven by Saudi Arabia and OPEC+ partially easing voluntary and group production targets. OPEC+ members are expected to account for almost two-thirds of production growth this quarter. The overall decline in investment and drilling is expected to result in flat-to-declining North American shale production in 2021, before recovering in early 2022. High production decline rates continue to be an obstacle to a robust recovery. Despite a brief, recent weather-driven decline in drilling activity, U.S. shale

production is expected to stabilize and begin rising modestly during the rest of 2021 (while still showing an average annual decline in 2021), before bouncing back in 2022. March data might shift our expectations since it will show the real production trajectory following the weather disruptions in U.S. drilling activities earlier this year. Improved pricing may also allow for a sharper-than-expected recovery in drilling activity and production.

Recent political and economic developments have made supply forecasts more complicated. Long-term goals and shorter-term impacts from the Biden administration's policies aimed at speeding up the energy transition under the 'Green New Deal' (on top of similar policies in other countries) make it safe to assume that investors may not be so optimistic about the oil sector's future profits. This may be an issue more for international oil companies (IOCs). It could also be beneficial for national oil companies (NOCs) in the long term if demand for oil outstrips efforts to mitigate its use.

We expect Libya to be the largest producer, with an expected growth of around 900 Kb/d (largely due to the recovery already seen), followed by Canada (400 Kb/d), Iran (300 Kb/d) and Norway (205 Kb/d). Although Iran declared that it may double its production if sanctions are lifted, statements by the current U.S. administration indicate that the process of lifting sanctions may take longer than expected. Increased shipments to

destinations like China indicate that production growth will not be a step-change but more of a gradual slope.

High inventory and spare capacity levels, persisting well into 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 infections fail or OPEC+ members relax their cuts too quickly (or if discipline erodes). A particular area of note for the oil market is the coming winter, when it may be necessary for a temporary OPEC+ cut of 500 Kb/d in Q1 2022 (after an assumed increase in Q4 2021) to maintain a supply deficit. As always, ample inventories have the potential to cushion volatility. With global inventories declining, it appears unlikely that storage will again threaten to reach historic capacity levels as it did last year. However, the potential for this to happen exists when spare capacity remains at high levels and demand depends on an evolving virus.

KOMO's supply/demand forecast is an average for each quarter and does not take into account short-term volatility. Actual changes to supply and demand will, of course, remain volatile in light of the responses to and the 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 4.3 MMb/d in 2021 and further increase by 3.2 MMb/d in 2022 YoY. Furthermore, global demand is expected to grow QoQ in Q2 2021 by 1.9 MMb/d, after a QoQ decline in Q1 2021 of around 1.6 MMb/d. The predicted growth comes from the easing of health measures and recovering economies in Europe, Asia and Africa, and improved U.S. demand post-winter. Vaccine rollouts have accelerated, and milder weather in the Northern Hemisphere is also driving this trend. As discussed earlier, our projected demand growth for 2021 is below that of many forecasts due to a more cautious outlook for virus containment, mobility and economic growth.

We expect OECD countries to witness similar oil demand growth to non-OECD countries this year, at around 2.06 MMb/d. We estimate that most OECD growth will be carried by the U.S., representing 93% of OECD Americas' growth and 56% 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 to grow by around 1.2 MMb/d for OECD Americas, followed by OECD Europe at 490 Kb/d and OECD Asia-Oceania by 330 Kb/d. We presume that non-OECD countries will witness a similar growth to total OECD demand of 2.24 MMb/d in 2021. 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 1.93 MMb/d, followed by Latin America at around 370 Kb/d, and Africa by around 50 Kb/d.

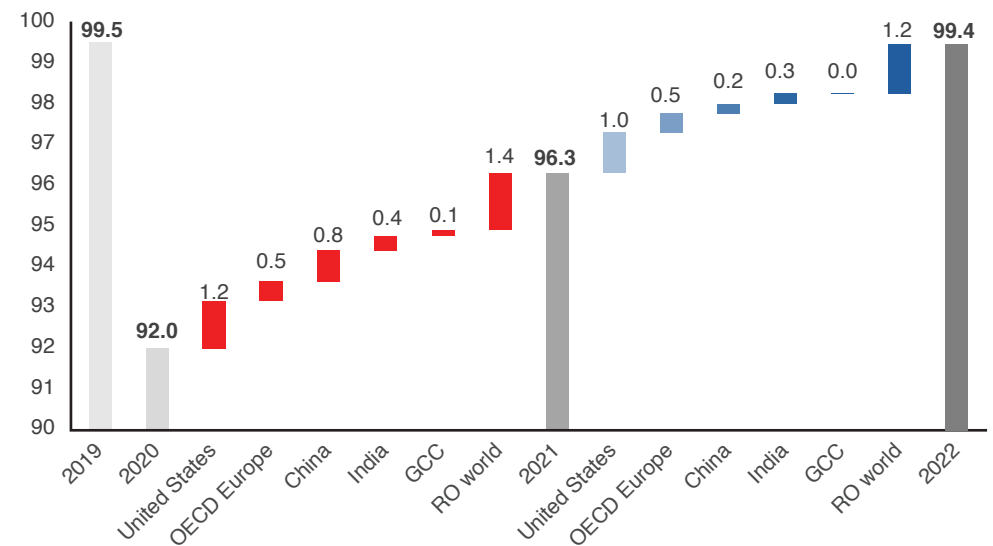
On the other hand, both the Middle East and Eurasia are anticipated to witness demand declines in 2021 of 40 Kb/d and 65 Kb/d, respectively. As discussed earlier, and in accordance with the IMF's recent outlook, we estimate hydrocarbon exporting countries to have weaker recoveries than other regions, 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 40 Kb/d and 105 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 as a whole.

In 2022, we presume that all OECD countries will see oil demand growth except for Japan and New Zealand, which may decline by 90 Kb/d and 25 Kb/d, respectively. Japan's expected 2021 increase in demand is partly short term due to its preparation

for the Olympics. We assume that oil demand in the OECD Americas will reach their 2019 levels by the second half of 2022, with OECD Asia Oceania doing so by the beginning of 2022. Although we expect OECD Europe to have an overall demand growth of 1 MMb/d throughout 2021 and 2022, we do not expect it to 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 forecast with this one, we highlight that we have toned down our forecast for Eastern European OECD demand growth.

We estimate that demand growth for non-OECD countries in 2022 will grow at a slower pace than OECD countries, at 1.4 MMb/d. This is because demand from most non-OECD countries is expected to reach 2019 levels by the end of 2021 before returning to their natural growth trajectories. Asia will represent around 60% of that growth.

Annual global oil demand growth, MMb/d, 2021-2022



Source: KAPSARC, April 2021.

Note that the largest YoY oil demand growth ever recorded was at 4.1 MMb/d in 1973, according to the BP Statistical Review of World Energy. We project growth for 2021 to be 4.3 MMb/d. However, global oil demand levels will remain below those of 2019.

Demand levels

2020	Q1	Q2	Q3	Q4	2020
OECD	46.2	40.2	43.3	43.2	43.2
Non-OECD	48.1	45.7	49.0	52.4	48.8
Global demand	94.3	85.8	92.2	95.5	92.0

2021	Q1	Q2	Q3	Q4	2021
OECD	43.4	44.5	46.5	46.7	45.3
Non-OECD	50.5	51.4	51.5	50.7	51.0
Global demand	93.9	95.8	98.0	97.4	96.3

2022	Q1	Q2	Q3	Q4	2022
OECD	46.8	46.2	47.2	47.9	47.0
Non-OECD	50.7	52.3	53.4	53.2	52.4
Global demand	97.5	98.5	100.6	101.2	99.4

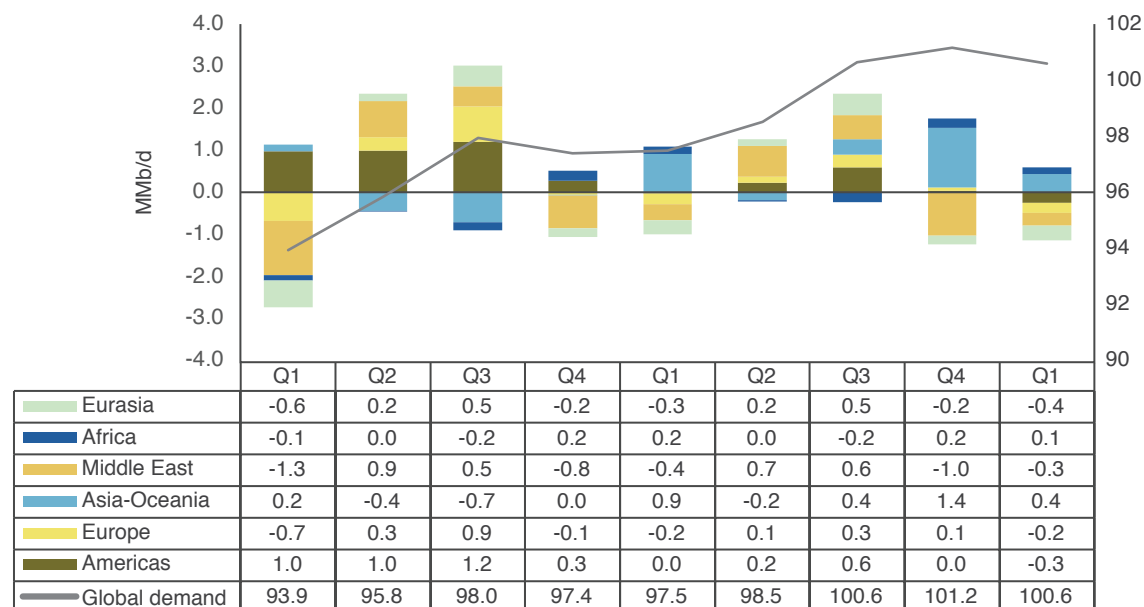
2023	Q1
OECD	46.8
Non-OECD	50.7
Global demand	97.5

Non-OECD is expected to retain its 53% share of global oil demand in 2021 and 52% in 2022, as it will also account for 52% of demand growth in 2021, but in 2022 it will only represent 44% of this growth.

Apart from the Middle East's usual seasonal changes in demand, the Americas will face the largest QoQ fluctuation in oil demand growth between 2021 and 2022, driven by a demand recovery in the U.S.

Our current demand assumptions are susceptible to significant changes, depending on the impact of the COVID-19 vaccinations and the speed of their distribution on the recovery in economic activity and travel. Further revisions to these assumptions will be needed as we progress through Q2 2021, particularly for non-OECD countries.

Regional oil demand growth, MMB/d, Q1 2021 - Q1 2023



Source: KAPSARC, April 2021.

United States

MMb/d	2020	Q1	Q2	Q3	Q4	2021	Q1	Q2	Q3	Q4	2022	Q1
U.S.	18.3	18.7	19.1	19.7	19.9	19.4	20.2	20.3	20.7	20.7	20.5	20.6

2021-2022

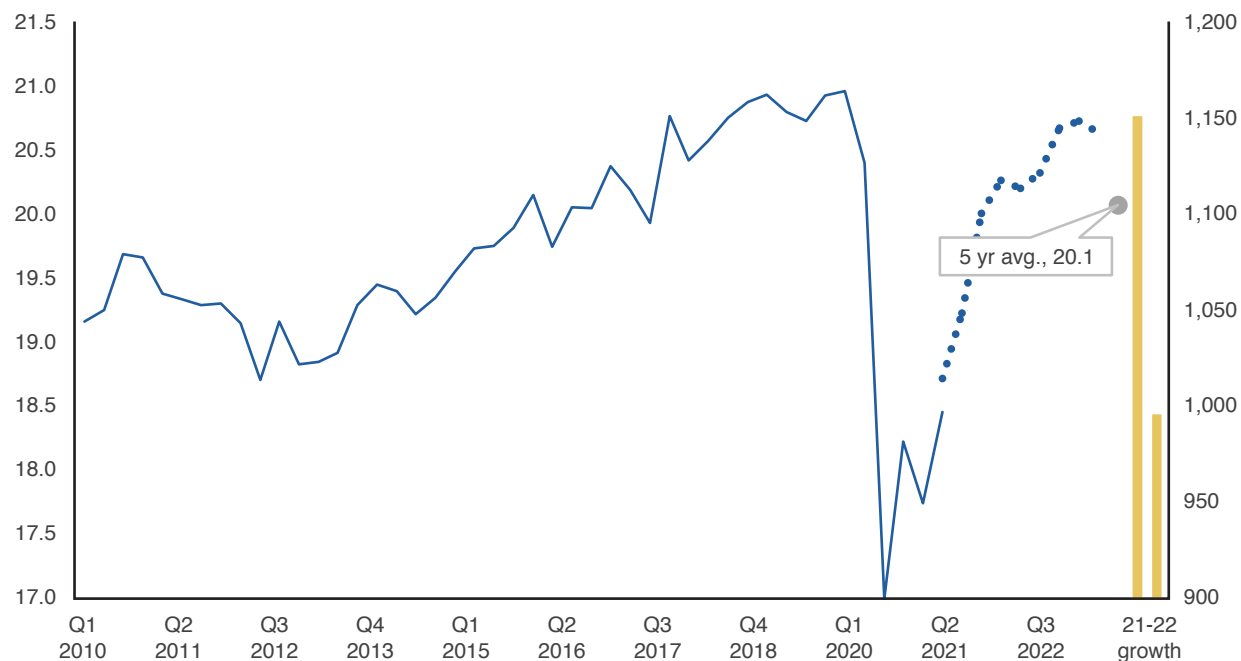
U.S. oil demand is expected to grow by around 1.2 MMb/d in 2021 and continue to grow by 1 MMb/d in 2022, yet remain below 2019 levels. This recovery would correlate with recent reports of an improved economy, with estimations of a strong GDP recovery and improving unemployment rates. As such, the KOMO team revised U.S. demand growth up by 300 Kb/d. Just as transportation fuels were hit the hardest in 2020, we presume that they recover the fastest in 2021.

U.S. gasoline demand in 2021 should see the strongest growth (530 Kb/d), followed by gas oil/diesel (230 Kb/d), liquified petroleum gas (LPG) (130 Kb/d), and other heavy fuels, albeit we expect the latter to stage only a limited recovery.

Q1 2021

We expect the end of winter in the United States to drive significant QoQ demand growth of around 700 Kb/d, with the beginning of the driving season increasing gasoline demand by 700 Kb/d. Milder weather should reduce LPG and fuel oil demand by 200 Kb/d and 100 Kb/d, respectively, and we expect naphtha and aviation fuel demand to grow at a slow but consistent 100 Kb/d.

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



Source: KAPSARC, April 2021.

OECD Europe

MMb/d	2020	Q1	Q2	Q3	Q4	2021	Q1	Q2	Q3	Q4	2022	Q1
OECD Europe	13.1	13.0	13.3	14.1	14.1	13.6	13.8	14.0	14.3	14.3	14.1	14.1

2021-2022

OECD Europe's oil demand is expected to grow by 490 Kb/d in 2021 and another 480 Kb/d in 2022. Similar to the U.S., the EU is expected to recover much – but not all – of its lost demand from 2020. However, unlike its OECD counterparts, 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 are 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.

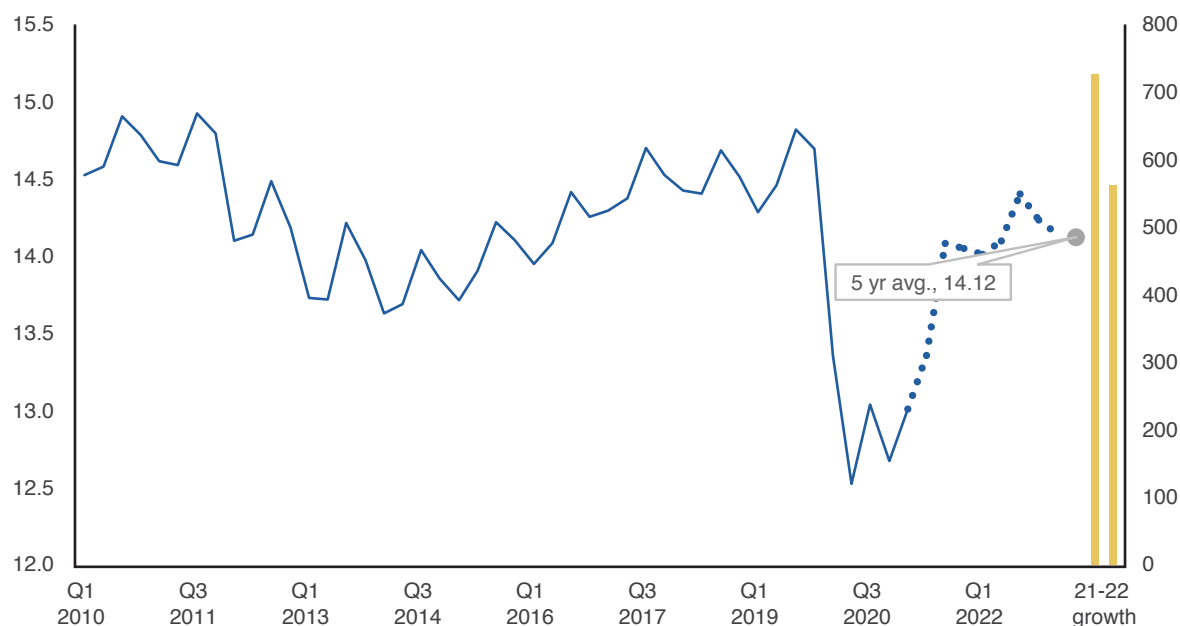
We expect a resumption of transportation activities in 2021 to drive diesel up by 230 Kb/d (47% of the total growth) because much of the European fleet relies on this fuel. Gasoline demand is expected to rise by 60 Kb/d, followed by heavier fuels at around 50 Kb/d.

Q1 2021

QoQ demand in the second quarter is expected to grow by around 350 Kb/d, with diesel/gasoil representing almost 70% of this recovery. Heavier

fuels are estimated to grow by around 200 Kb/d and motor gasoline by 100 Kb/d, whereas LPG demand is expected to decline by around 200 Kb/d following the end of the winter season.

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



Source: KAPSARC, April 2021.

China

MMb/d	2020	Q1	Q2	Q3	Q4	2021	Q1	Q2	Q3	Q4	2022	Q1
China	13.5	14.9	14.6	14.0	13.6	14.3	14.0	14.5	14.5	15.0	14.5	14.8

2021-2022

We expect China to be the only major country with stable (or even increasing) demand in 2020. It was the first country to be impacted by the virus in 2020 and one of the first to rebound. Couple this with its effective quarantine measures and ability to store large quantities of oil in 2020, and we can expect resilient demand in 2021 and 2022. Nevertheless, we expect modest demand growth for China in 2022 of around 250 Kb/d. This comes on the back of it using much of its accumulated inventories in case prices rise, as well as its structural changes to reduce its oil consumption.

Expanded refinery capacity in cities such as Lianyungang, Dalian, Zhangzhou is expected to drive growth for 2021. However, as prices gradually rise and China's inventories fill up, we expect China's oil demand to ease from its robust (15.6 MMb/d) Q4 2020 level to a more normal level of around 14 MMb/d in 2021.

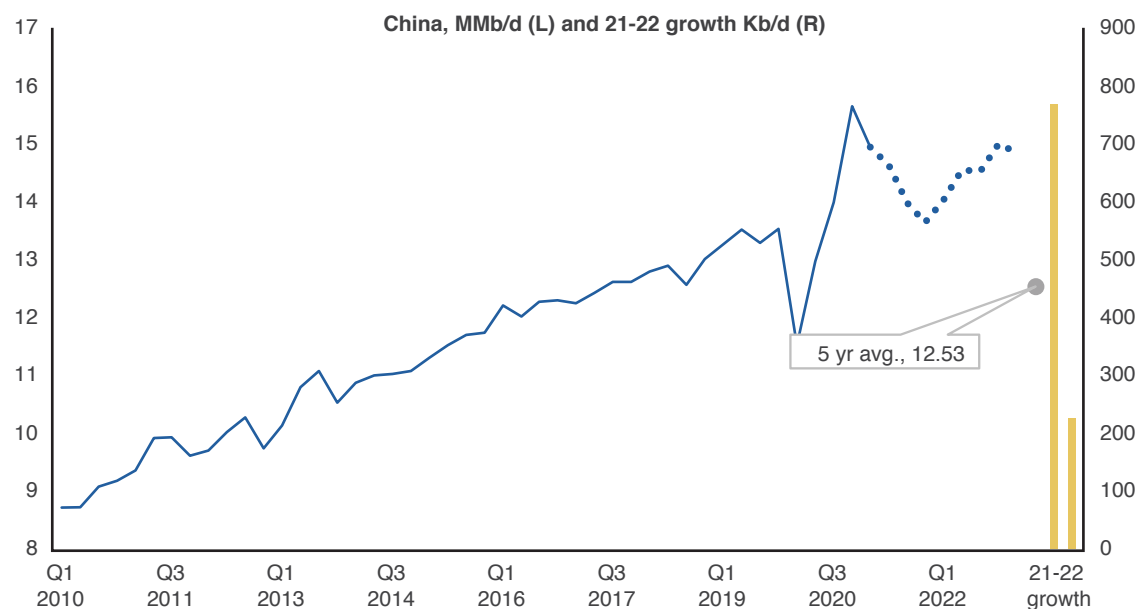
We expect China's oil demand to grow this year by around 770 Kb/d, with over 50% of this growth coming from transportation fuels. We expect diesel growth to reach 200 Kb/d and gasoline around 180 Kb/d, whereas national flights are expected to increase demand for jet fuel by around 50 Kb/d.

Q2 2021

China's expected demand (purchases) and consumption (usage) patterns vary significantly between Q1 and Q2 2021. Although its fuel consumption is expected to be around 13 MMb/d -14 MMb/d, we see demand at around 14.6 MMb/d. This suggests that, for the coming quarter, around 1 MMb/d -1.2 MMb/d will be placed in storage. While China's consumption of refined products tends to stabilize in Q2 (QoQ), we expect there to be a QoQ decline of 300 Kb/d this quarter in

total Chinese demand. This reflects a saturation in China's inventory levels in the previous quarter, since we expect that an average of 1.5 MMb/d was stored during that period.

Regarding consumption, China's most significant fuel for demand growth this quarter will be diesel, at around 500 Kb/d. This will be followed by aviation fuel, as national flights resume operating strongly, and heavier products, representing an increase of 200 Kb/d each, and motor gasoline at around 100 Kb/d.



Source: KAPSARC, April 2021.

India

MMb/d	2020	Q1	Q2	Q3	Q4	2021	Q1	Q2	Q3	Q4	2022	Q1
India	4.6	5.0	5.0	4.7	5.0	4.9	5.2	5.3	5.0	5.3	5.2	5.6

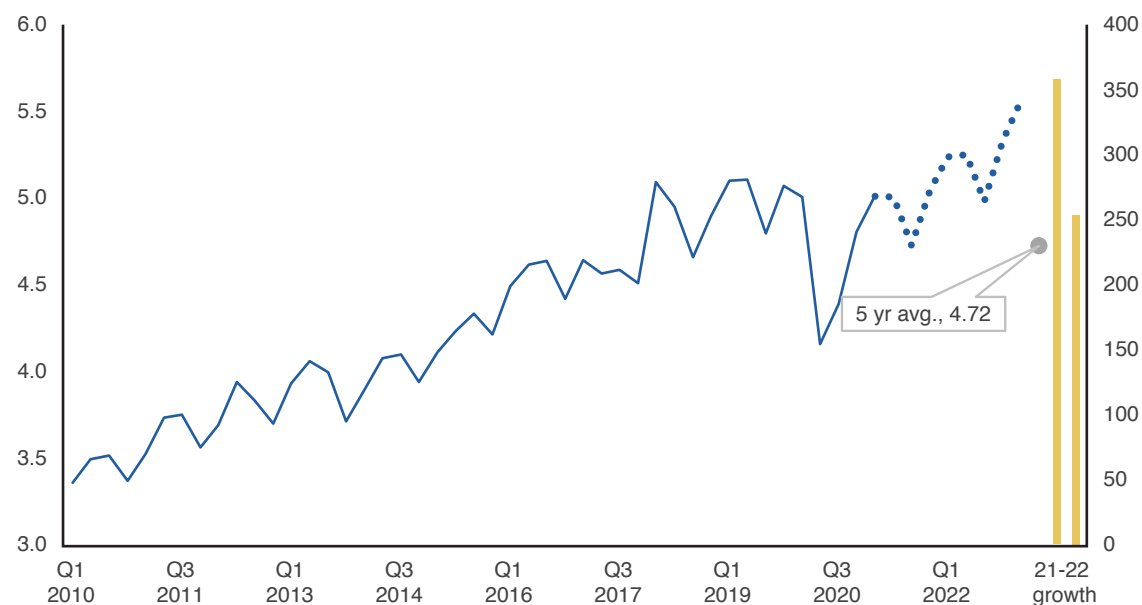
2021-2022

India's oil demand is expected to grow by around 360 Kb/d in 2021 and 250 Kb/d in 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. However, we expect that the 3-5 million fewer new cars purchased in 2020 compared with 2019 will support higher demand for gasoline and diesel. KOMO expects relatively robust vehicle sales for 2021 (between 21-26 million units) to drive diesel demand up by 130 Kb/d and gasoline demand up by around 50 Kb/d, despite rising fuel costs. Government deregulation of LPG prices risks some stagnation for LPG demand in 2021, but for now we have a bearish growth estimate of 60 Kb/d for LPG.

Q2 2021

QoQ India shows modest growth of 80 Kb/d as the new financial year begins and as COVID-19 cases continue to rise. Diesel oil demand stands out, with an expected increase of 100 Kb/d, followed by motor gasoline at around 50 Kb/d. We expect LPG demand, however, to start to feel the impact of increased pricing and decline by around 60 Kb/d.

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



Source: KAPSARC, April 2021.

Saudi Arabia

MMb/d	2020	Q1	Q2	Q3	Q4	2021	Q1	Q2	Q3	Q4	2022	Q1
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

2021-2022

Saudi Arabia's oil demand should rebound by 40 Kb/d in 2021 then continue rising by a further 30 Kb/d in 2022. (Projected 2022 growth is 50% less than our previous forecast).

Overall, Saudi Arabia's demand for 2021 will range between 3 Kb/d-7 Kb/d for all fuels. Low oil production levels have impacted the country's projected economic growth. According to the IMF's October outlook, Saudi Arabia's real GDP was expected to decline by 5.4% in 2020 and only partially recover by 3.1% in 2021. Couple this limiting factor with the 2020 VAT increase, alongside a slowdown in vaccine distribution in Q1, and we expect a slower economic activity for Saudi Arabia than previously estimated.

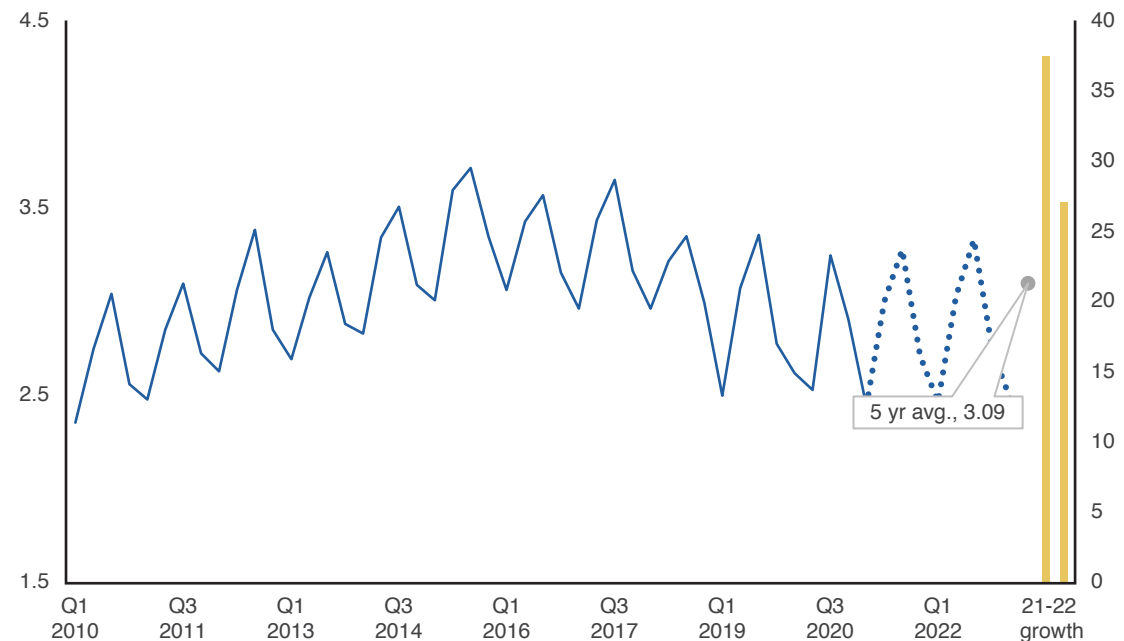
Q2 2021

QoQ, total oil demand is expected to grow by around 550 Kb/d. This growth comes alongside Saudi Arabia's seasonal demand for electricity generation increasing. However, under the current circumstances, including the Kingdom's additional February cuts, Saudi Arabia's use of associated gas from drilling activities for electricity generation is constrained. This results in the need to

burn more oil for electricity generation. This makes us consider that perhaps sometime this quarter, the Kingdom may continue to relax its OPEC+ cuts further post-July with minimal impact on the oil market, as it will most likely be consumed domestically.

We expect demand for diesel/fuel oil to grow by 200 Kb/d, other heavier fuels by 200 kb/d and gasoline by 100 Kb/d, since May and June signal the beginning of the summer vacation season.

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



Source: KAPSARC, April 2021.

Discussion

Supply in 2021 is proving to be as interesting as in 2020, and forecasters are having a hard time keeping up with day-to-day developments. Market watchers have found predicting OPEC+ behavior difficult: many did not expect the extra voluntary cuts by Saudi Arabia in January and assumed that the meeting in April 2021 would be a roll-over instead of a significant easing. Price forecasts have a huge variance, with some exuberant traders calling for \$100 per barrel by the end of the year, while others are worried that a quick relaxation of Iranian sanctions would result in prices dropping significantly.

Prices in 2021 have been nearly as volatile as they were last year. The early price rally of the first quarter was tempered by OPEC+ easing, which did not drop prices as much as feared. The Iranian Joint Comprehensive Plan of Action (JCPOA) discussions will take a while, and the Ever Given crisis in the Suez Canal, while highlighting the vulnerability of bottlenecks to global trade, is already a memory. The excitement surrounding this incident momentarily glossed over the ongoing problem of COVID-19 and the associated efforts to resolve the situation. The return of demand is still the central issue that will limit supply growth.

Highlights from this edition are:

- The nimble OPEC+ strategy is more proactive than expected, requiring a rethink of our assumptions where faster adjustments can track demand more closely.
- Our forecast for sanctions is largely unchanged, with Iran on a long gradual rise with covert sales to China allowing for early gains, while Venezuela is unlikely to see much improvement.
- We expect shale production to be flat/down in 2021, with a rebound in 2022 as talk of fiscal responsibility and changing government policy slows investment in growth.
- The transportation problems for oil sands could become more challenging, with Keystone XL's approval vetoed and other pipelines under threat.

The takeaway message for this year in supply is “wait and see” and “don't expect huge price movements.” Both of these are predicated on continued diligence from OPEC and partners, a generally improving economic environment, faith in government bureaucracy delaying sanctions discussions, and the rest of the market producing according to their own economic circumstances. It may not be as exciting as 2020, but that may be a welcome change.

Supply forecast

Global liquids supply is expected to grow by about 1.025 MMb/d in 2021 to reach an average of 95.2 MMb/d for the year. We expect 2022 to see a 3.4 MMb/d increase in supply, driven by demand, with an average supply of 98.6 MMb/d for the year, almost reaching pre-pandemic levels at about 100 MMb/d by year-end. While this is not the 'V'-shaped recovery that we had hoped for a year ago, it is a clear path back to normality.

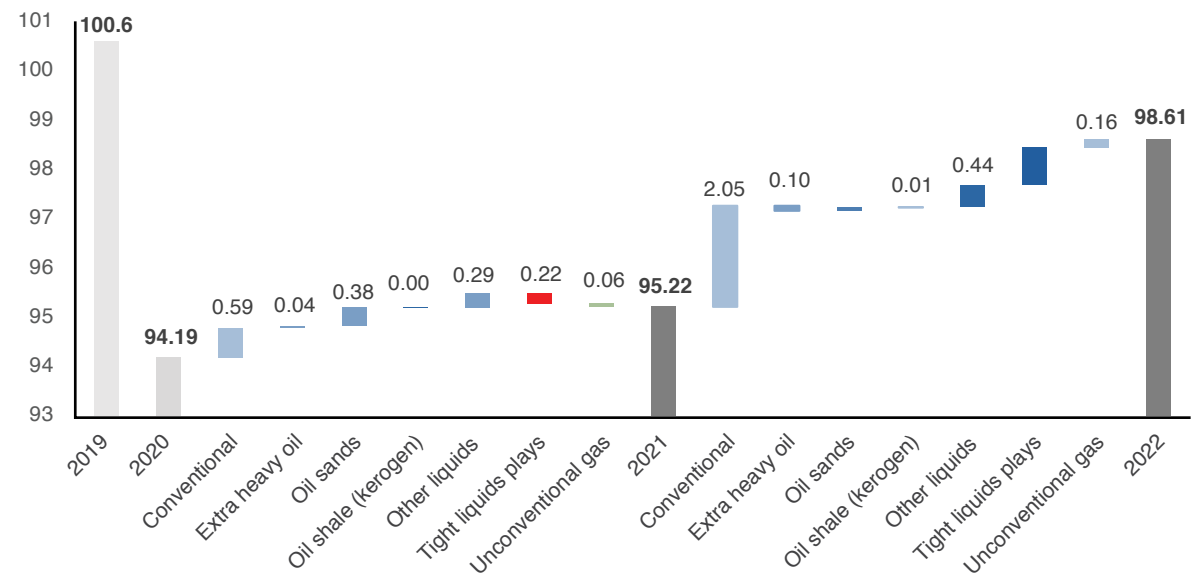
Demand is still the major cap on supply growth. Still, inventory withdrawals have remained steady, the economy is showing green shoots in places like the U.S., OPEC+ has remained diligent in its duties, and prices have stabilized at a level that can sustain most producers. While vaccines are rolled out, stimulus measures are implemented, and geopolitical issues are calmly sorted out, we must wait while the market rights itself.

In our editorial, we discuss how a variable recovery is causing some confusion in the market, with a wide range of forecasts calling for very optimistic or pessimistic outcomes. We must remember that this is a global crisis, and it takes time for everyone to recover. Local conditions may be great (Australia) or poor (Brazil), but that does not translate to the entire market. Gradual growth and stable pricing may not grab headlines, but it reflects the realities of a market with such a wide range of participants. However, there is also a wide range of uncertainty and risks.

Non-OPEC+ players will grow their supply modestly as economics and their budgets dictate, while we assume OPEC+ members' supply will follow the demand curve to keep things stable. We expect shale to have a flat/downward trend for 2021 and a modest rebound in 2022 due to investor caution and policy hurdles. Canadian oil sands are likely to see renewed constraints on their transport and, while rebounding in

2021, they may start topping out on capacity constraints in 2022. Libya is the big winner for 2021 with 900 Kb/d of regained production, largely based on the increases in supply already seen, since we expect fewer further gains. Lastly, as mentioned in our last edition, offshore players like Norway and Brazil (and to a much lesser extent, Guyana) will also provide some gains over our forecast window.

Annual global liquid supply, MMb/d, 2021-2022



Source: KAPSARC, April 2021.

OPEC+

The outlook for Venezuela and Iran is dominated by the question of when their sanctions will be lifted. Iran is eager to double its production, while Venezuela has begun to explore a re-opening of its oil industry to private investment and control. Both actions may be a little premature while sanctions are still in force, but this has not stopped them from pushing the issue. Iran's shipments to China increased as both countries test the intentions of the new U.S. administration, while Venezuela is attempting a vaccines-for-oil workaround. The Biden administration may not be in a hurry to resolve the sanctions, but it is also somewhat passive in enforcing them. For Iran we see steady growth of 315 Kb/d and 335 Kb/d in 2021 and 2022, respectively, reflecting a gradual (official and unofficial) easing of sanctions instead of a sudden step-change from a policy shift. For Venezuela, we see virtually no change in 2021 and 2022 (+/-40 Kb/d) as there is little incentive for the U.S. to lift its sanctions, and domestic production is incapable of recovering without major interventions from foreign firms, which cannot be done covertly. Libya, the other exempt OPEC member, will likely have a banner year in 2021, with over 900 Kb/d of increased production, as their internal problems have stabilized for now. Beyond this, however, the Libyan gains quickly top out, and 2022 sees virtually zero growth for the country.

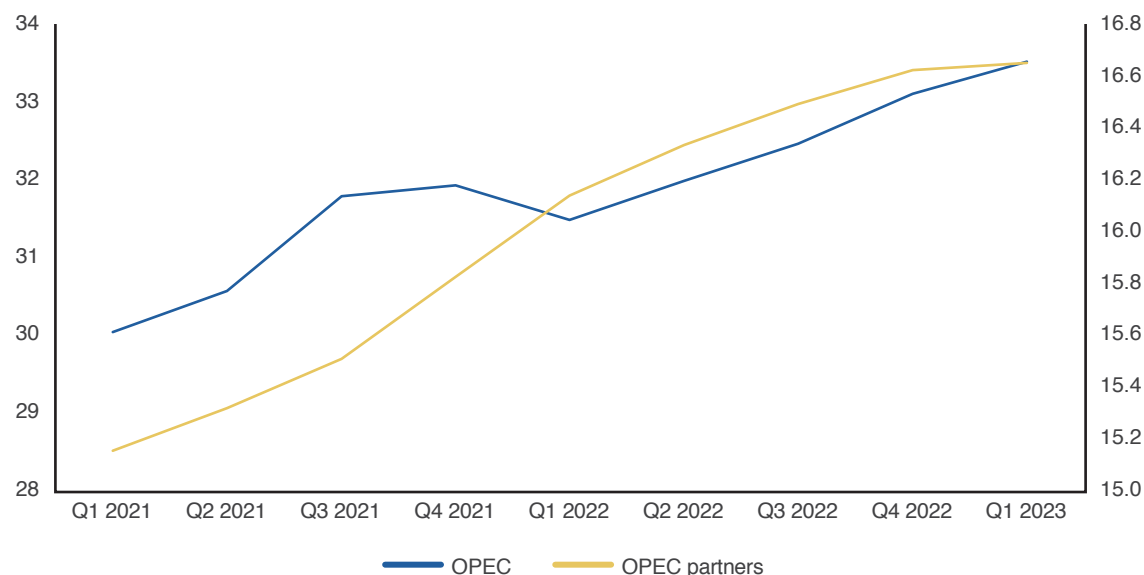
For the non-exempt members of the group, prior worries about compliance and defection may be decreasing with rising oil prices and eased production cuts showing that cooperation does pay off. Iraq, one country of concern,

has held its compliance level well this quarter despite its financial difficulties. Plans for the Iraqi oil sector to expand production to 8 MMb/d by 2029 announced by the country's oil minister are not in conflict with the current OPEC strategy, showing that OPEC membership has value in the short term while Iraq plans for long-term growth. The increase in production from other members is a positive note with little else to comment on.

One interesting item from this quarter is the launch of the new Murban futures from the United Arab Emirates

(UAE). Touted as a potential competitor to Brent and West Texas Intermediate (WTI) as a world-benchmark crude, there is some discussion as to the impact it will have on OPEC, specifically countries in the Arabian Gulf. As a new market offering, it will take a while for its impact to be felt. In the long term, the Murban futures could place a theoretical constraint on the UAE's compliance and a price anchor for negotiations around similar crude grades. However, it is unlikely to have a major impact on larger producers or their market leverage.

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



Source: KAPSARC, April 2021.

OPEC and partners supply changes for 2020 and 2021, Kb/d

	2021	2022
Mexico	(57)	(32)
South Sudan	0	2
Equatorial Guinea	(18)	(18)
Brunei	16	3
Sudan	9	6
Bahrain	0	7
Gabon	43	41
Oman	(15)	(10)
Congo	(23)	(28)
Malaysia	29	43
Azerbaijan	23	17
Nigeria	3	41
Kazakhstan	(11)	31
Algeria	(133)	115
Angola	(60)	(4)
Kuwait	(69)	75
Venezuela	213	248
Iran	13	(33)
UAE	(126)	89
Saudi Arabia	(125)	537
Iraq	(36)	158
Libya	874	(10)
Russia	102	722
OPEC	484	1,150
OPEC Partners	169	852
OPEC+ TOTAL	653	2,001

Source: KAPSARC, April 2021.

OPEC+ spare capacity

In the previous edition, we laid out a path for OPEC and partners to reduce their cuts and spare capacity in an even and gradual manner throughout the forecast period. However, adjustments within the group, including Saudi Arabia, have shown that a more proactive set of measures are being used. The group has held cuts when needed, and Saudi Arabia's voluntary addition of 1 MMb means that adjustments are not only downwards. More recently, the market's smooth acceptance of a faster than expected easing of cuts also means that larger increments can be eased than we had previously envisioned. We recommended/applauded this fine-tuning approach before and have been pleasantly surprised at how well it has been implemented.

As such, the KOMO team now believes that:

1. Tracking the demand curve to maintain inventory drawdowns is still a priority.
2. An active management approach means larger/ steeper adjustments when needed.
3. If cuts can be reinstated later, then larger easings can be made upfront.

The important result of this adjustment is that the production increase is not a gradual line that skirts the bottom of the demand curve, but a more dynamic one that follows it. The front-loading of easing, with Saudi Arabia's voluntary cuts eliminated by the end of July, and OPEC+ reducing slightly more over the same

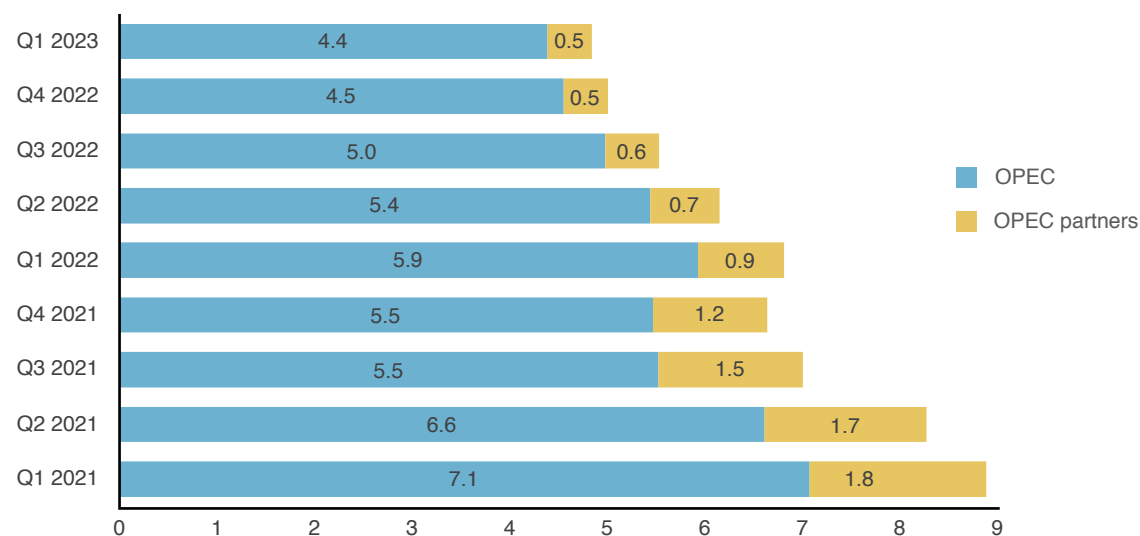
period, takes advantage of the boost in demand and prevents prices from rising too quickly.

The winter of 2021/2022 will be an important period. We expect that a drop in demand will call for a temporary cut of 500 Kb/d to prevent an inventory surplus. As this would be a relatively modest, temporary adjustment, we assume that Saudi Arabia may carry it unilaterally to maintain group cohesion. After that point, a rebound in demand would allow for a significant easing across the group, although spare capacity under this scenario would remain at elevated levels into 2023. The prospect

for continued inventory withdrawals in late 2022/1Q23 suggests that OPEC+ members may be able to raise their output even more rapidly than we have assumed, without affecting prices.

It is possible to 'fill' more of the gap in the demand curve with even more aggressive management, but that would prolong the time needed for inventory drawdowns and demand a higher level of coordination to share cuts among the group during winter. The current outlook is a compromise of these goals and limitations.

OPEC and partners spare capacity, MMb/d
Technical base

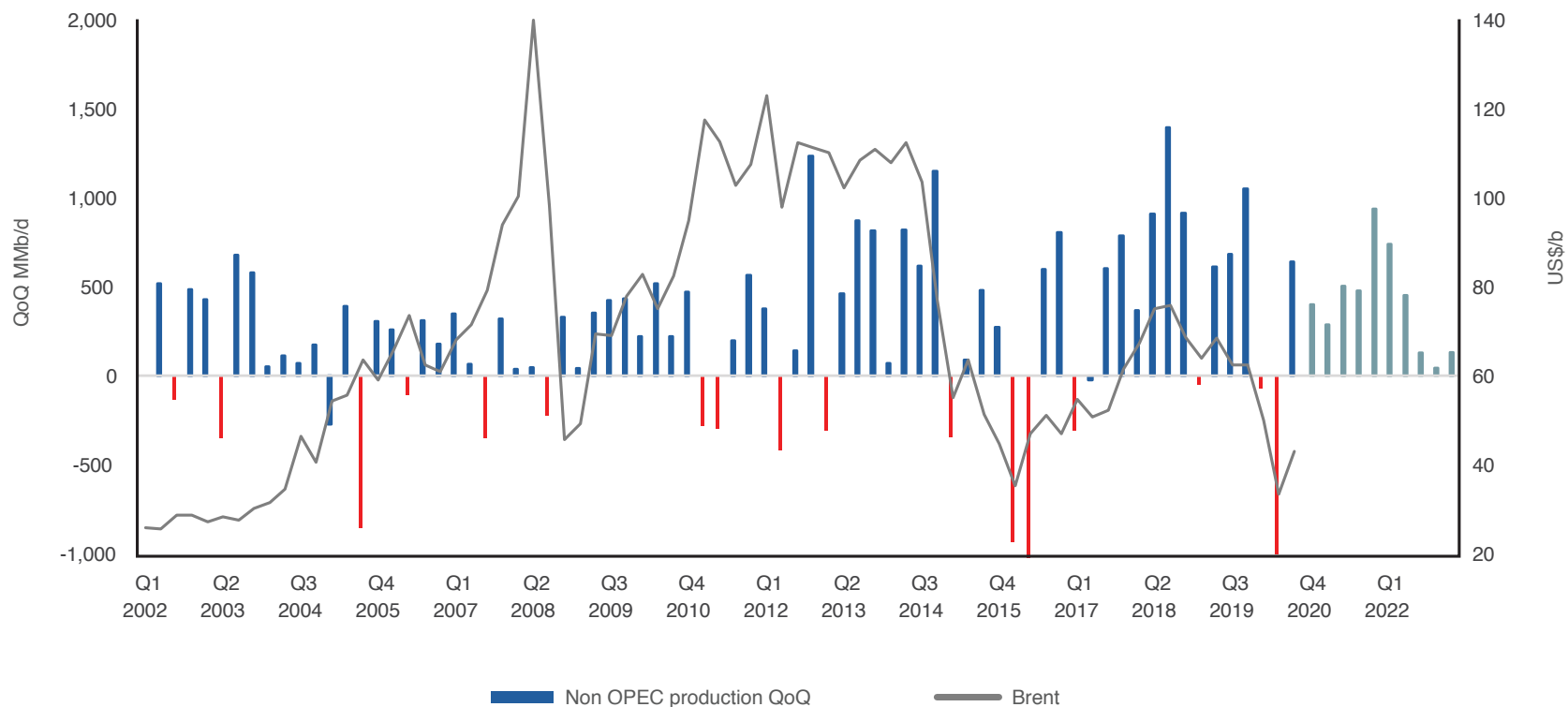


Sources: Rystad; KAPSARC, April 2021.

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

Non-OPEC+

Non-OPEC production and Brent crude oil prices



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

Non-OPEC+ growth:

- In 2021, the supply of tight oil is expected to fall by 220 Kb/d, and unconventional gas liquids will decline by 60 Kb/d, while oil sands will reclaim 380 Kb/d.
- In 2022, the outlook for tight oil is a rebound of 780 Kb/d, with unconventional gas liquids growing by 160 Kb/d, and oil sands picking up an additional 65 Kb/d of growth.
- Key features of the non-OPEC+ production story for the next eight quarters will be patience and planning. OPEC+ easing should keep the price stable while all players reorganize, work on their budgets, and make strategic decisions.

Non-OPEC (tight oil and oil sands)

Improved pricing for oil should drive significant growth in shale and oil sands. However, non-price factors appear to be limiting the upside. For oil sands the problem is clear, with their ongoing transportation issues the major factor. The constraining factor for tight oil is the regulatory and market environment dampening a surge in supply growth. Both issues have roots in the Biden administration.

As we head toward the end of the first 100 days of the new U.S. administration, there are hopeful signs that COVID-19 can be managed and that the U.S. economy is reviving. Some of this is attributable to direct actions like vaccine rollouts and stimulus spending, while some of it is incidental to the ongoing economic rebound. While oil demand is improving as a result of this rebound, supply has a much more uncertain future. In addition to rejoining the Paris Agreement, the U.S. government has paused oil and gas leasing on public lands, started discussions with energy firms on their methane emissions, introduced a large infrastructure bill with provisions for green energy and reduced hydrocarbon subsidies. It might also increase the corporate tax rate to 28%. All these are signals that the landscape has changed.

Due to the pandemic and low oil prices in 2020, costs were cut significantly, inefficient producers left the market, and mergers and acquisitions (M&A) activity continued. An interesting new development is the change in rhetoric and strategies of the shale players.

Their focus on shareholder value primarily reflects a shift among investors from rewarding growth to valuing returns as well as growing environmental, social and corporate governance (ESG) concerns. Managing cash flows to issue dividends and pay down debt, along with ESG initiatives, all come at the expense of growth. As such, the hype around shale may have dissipated, and it might start acting like a conventional portion of global supply. This newfound temperance may only last until the market tightens and prices jump further, but for our

forecast period, we expect a more cautious environment for shale.

While gains are incrementally upwards from quarter to quarter this year, the net change for 2021 from 2020 will likely be down by about 214 Kb/d as resumed drilling attempts to overcome the momentum of the decline rate. For 2022, we see the beginnings of the rebound, with crude and condensate rising by 570 Kb/d (excluding NGLs, etc.).

Monthly U.S. drilling activity (L) vs. global shale production (MMb/d) (R)



Source: KAPSARC, April 2021.

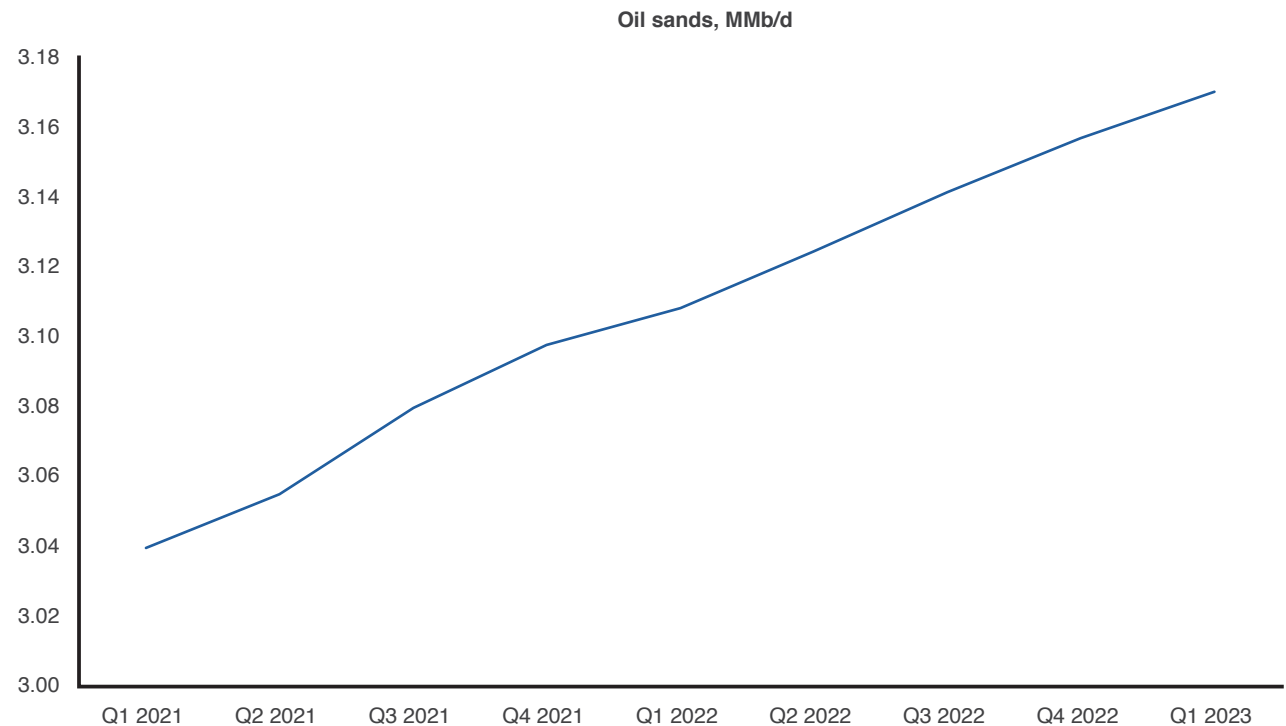
Non-OPEC (tight oil and oil sands)

For oil sands, the recurring problem of transport is likely to become a significant issue once again. Even with growing long-term ESG concerns, demand for heavy crude still exists, especially in the U.S. and China. However, the route (and cost) to transport crude remains problematic, despite increased shipments in the past few months, particularly to India. The revocation of the Keystone XL pipeline permit (currently being challenged in the courts) was a significant blow to oil sands' long-term (but not immediate) future, and further efforts to shut down the existing Line 5 in Michigan could limit producers' already difficult export options. Rail demand (and costs) rose in response to this news and is already squeezing oil sands' margins. To make matters worse, two U.S. legislative representatives (Earl Blumenauer and Senator Ed Markey) have proposed that Canadian bitumen be reclassified as crude oil, exposing it to an existing 5.5 cent U.S. tax used to pay for oil spill cleanups.

Despite the Trans Mountain Pipeline Expansion scheduled for completion within our forecast period, these factors above make it difficult to see a massive upside to Canadian production. Investors, who were previously attracted to the stable returns of oil sands, are now turning back to shale and producers' commitments to generating dividends. Oil sands are slated for a net rebound in 2021 of about 375 Kb/d YoY. This is due to the recovery of production lost last year

and new projects coming onstream. However, after this period, production will hit a ceiling and flatten to 65 Kb/d of gains as bottlenecks begin to bite and the 'pipeline' of new projects empties.

In the medium term, however, there is one bright spot: U.S. infrastructure plans. You cannot build roads without asphalt, and the oil sands have tonnes of it.



Source: KAPSARC, April 2021.

Risk scenarios January 2021

*The KOMO survey is conducted on a semi-annual basis, and the results from last quarter are still in effect.

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

KOMO uses the risk table to estimate potential impacts, taking two components into account: 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: The 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
Producer supply risks	OPEC compliance	Supply				
	Libya remains exempt	Supply	↓ 50 - 100			
	Shale rebound	Supply	↓ 0 - 120			
	Lifting Iran sanctions	Supply	↑ 0 - 210			
	Brazil's production growth	Supply	↑ 0 - 100			
	Venezuela's production rebound	Supply	↑ 0 - 160			
	Major conflict	Supply				
Demand risks	Prolonged economic crisis	Demand	↓ 300 - 1500			
	50% global population vaccinated	Demand	↑ 300 - 700			
	Transport behavioral changes	Demand	↓ 400 - 500			
	IMO sulfur regulations	Demand	↓ 0 - 150			

Air travel resuming 2019 levels in 2021	No	94%
Stimulus packages continue through 2021	Yes	94%
Strengthening U.S. dollar	No	77%
Oil prices averaging \$50/b in 2021-2022	Yes	55%

2021 and 2022 balances

Our assessment shows that the market is likely to remain in deficit over the next eight quarters. This assumes that OPEC+ members comply with their stated cuts and continue with a gradual and well managed following of the demand curve, while allowing for inventory withdrawals. 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.

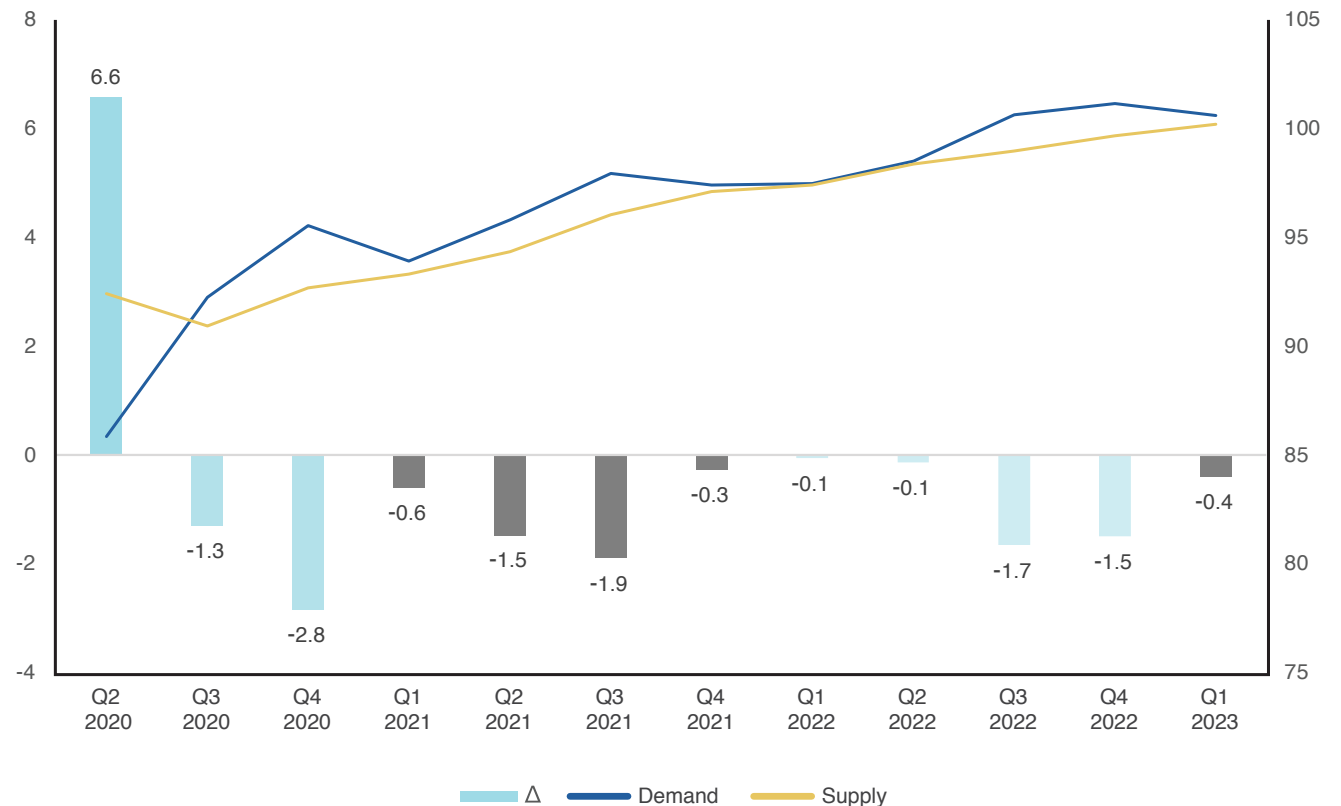
Furthermore, we also anticipate a potential surplus of supply at the beginning of Q1 2022. However, we assume that OPEC+ members, or Saudi Arabia unilaterally, will adjust production by around 500 Kb/d to maintain a steady streak of declines, resulting in OECD inventory levels reaching their pre-pandemic five-year average.

These supply/demand trends suggest an average global withdrawal from inventories of 1.1 MMb/d in 2021 and 800 Kb/d in 2022. Furthermore, we expect quarterly deficits to range between 0.1 MMb/d - 1.9 MMb/d during the next eight quarters.

Since our outlook assumes continued high levels of spare capacity throughout the forecast interval, OPEC+ compliance rates are a known risk if pricing improves, and fiscal realities test the resolve of some members.

While the group can preemptively increase production in this timeframe to gain market share, such a strategy may limit inventory drawdowns and depress prices.

Quarterly supply demand balance, MMb/d, Q2 2020 - Q1 2023



Source: KAPSARC, April 2021.

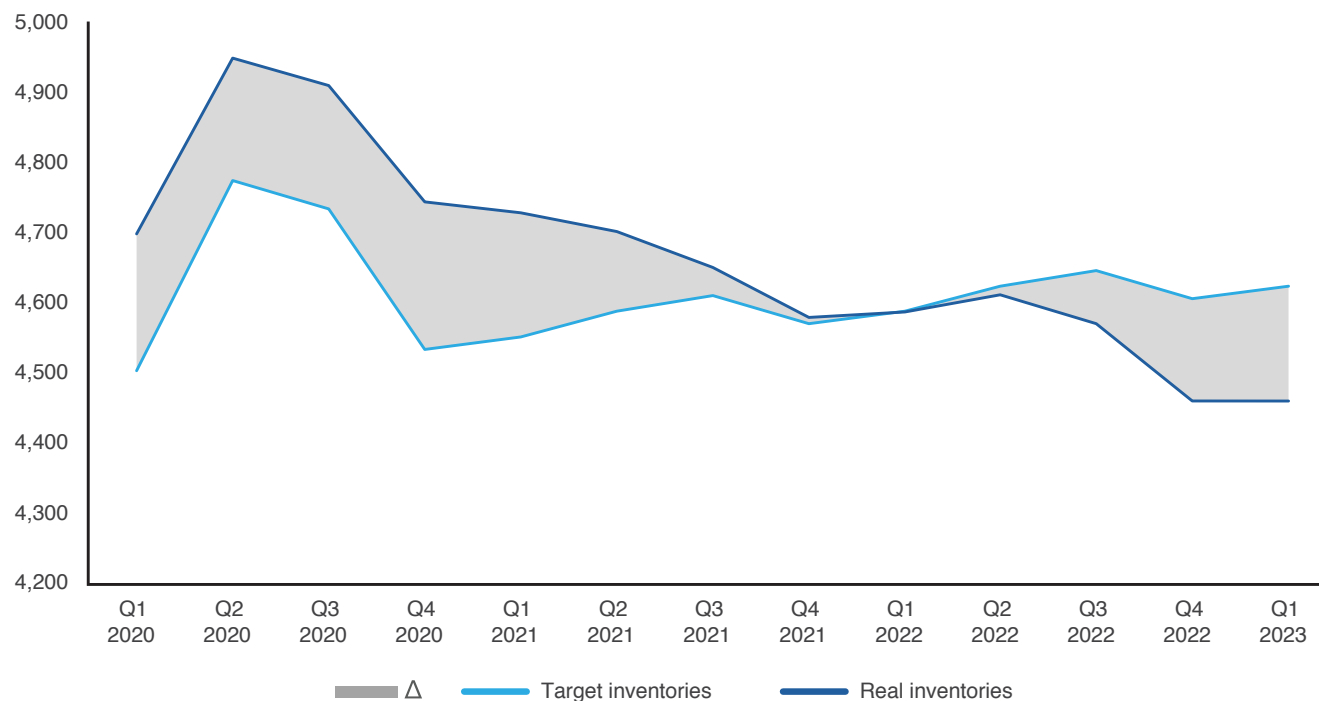
Price fundamentals (inventories)

Price movements for the foreseeable future will continue to be mainly influenced by evolving inventory levels. Given the latest adjustments by OPEC and partners, we expect a steady, but not massive, drain on inventories throughout the coming eight quarters. Under these assumptions, continued withdrawals will push stocks below target inventories by the end of 2021.

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 160 MMb in 2021, then continue to decline further by 108 MMb in 2022 as demand continues to exceed supply. This suggests OPEC+ may have headroom for additional production increases beginning in Q3 2022 (of 1 MMb/d), beyond the quarterly increases (roughly 500 Kb/d) we have assumed for this outlook, without threatening prices. The 15th OPEC and Non-OPEC Ministerial Meeting held in April 2021 pledged to not exceed 500 Kb/d on a monthly basis.

With demand recovering gradually and OPEC+ production easing, a favorable price environment emerges, with the likelihood of the Brent price exceeding current estimates on the forward curve. The buildup from 2020 will probably dissipate within the forecast period, but this is highly dependent on compliance and the OPEC+ strategy post July, with some concern around Q1 and Q2 2022.

Target inventories vs. real inventories (L) and Brent prices (R)



Sources: EIA; KAPSARC, April 2021.

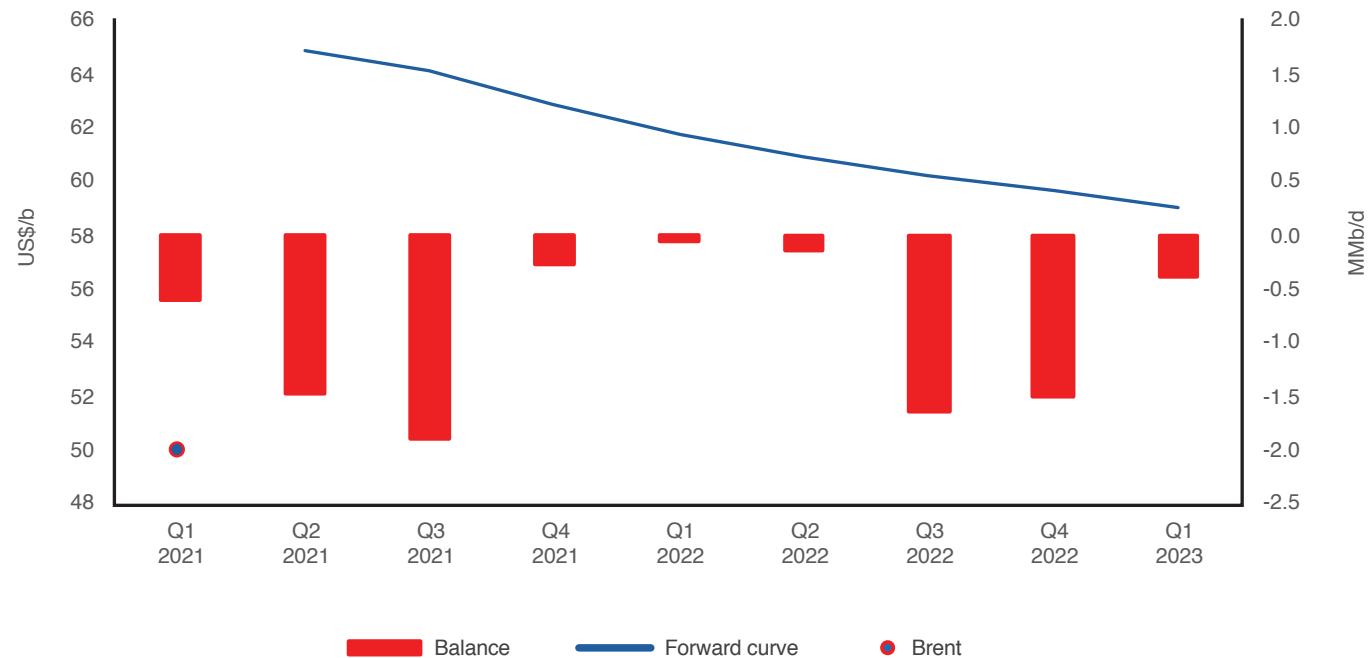
Price fundamentals (Brent)

	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022		2021	2022	2023
Bloomberg	61.71	62.03	62.20	60.51	60.25	62.10		Bloomberg	60.69	61.96	62.85
Market sentiment	62.57	62.29	60.86	60.13	59.50	60.50	61.50	Market sentiment	60.54	61.86	64.00

Source: Bloomberg, April 5, 2021.

*Market sentiment is based on publicly available forecast data.

KOMO Brent forecast vs. balances and forward curve

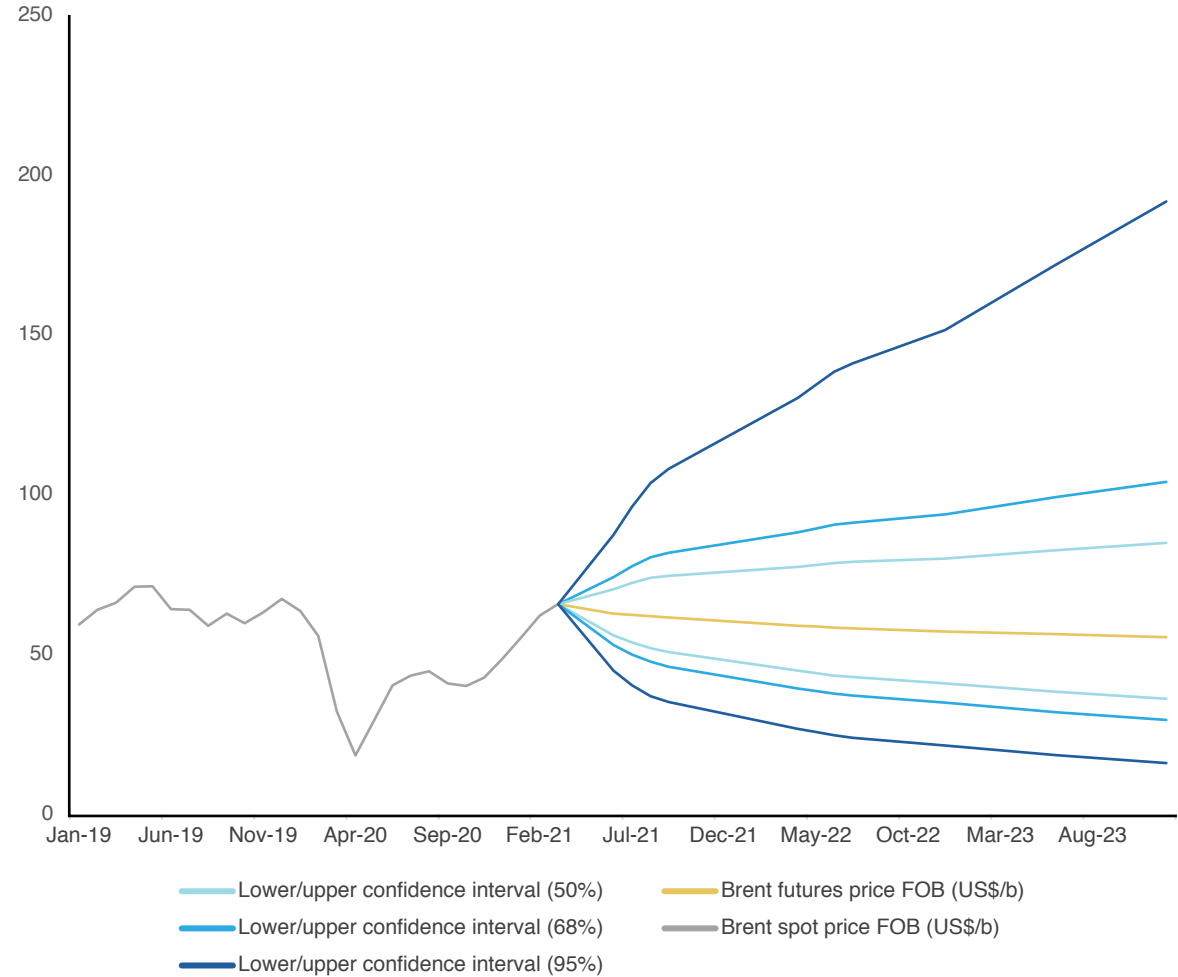


Price fundamentals (forward and future curves)

The graph below depicts confidence intervals derived from options market information for at-the-money options contracts.

The graphs represent boundaries calculated at 50%, 68% and 95% confidence intervals.

Brent crude oil price and 50%, 68%, 95% confidence intervals US\$/b



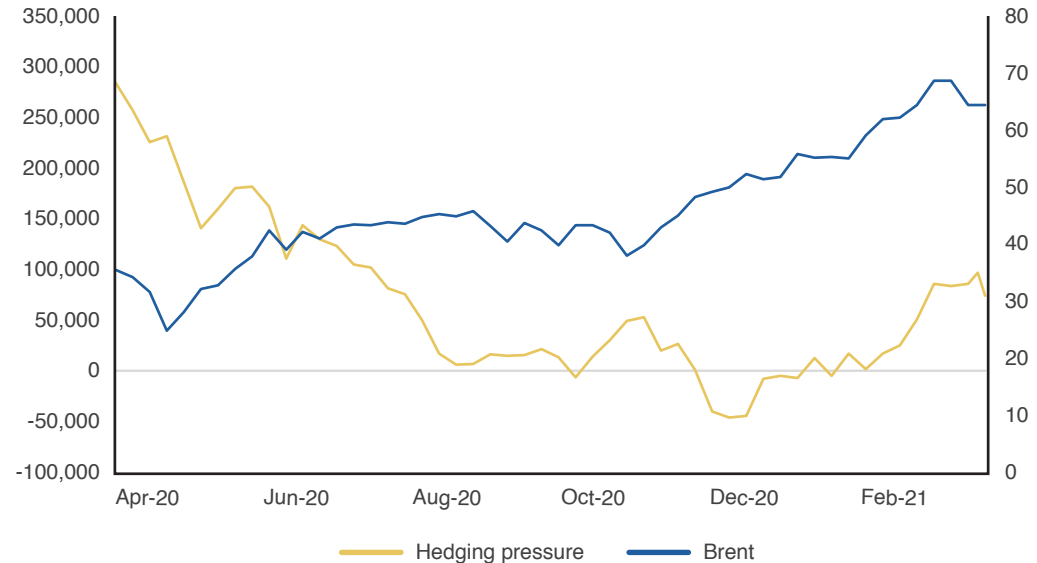
Source: KAPSARC calculations based on NYMEX data, CME Group, FINCAD, April 2021.

Price fundamentals (markets)

Hedging pressure (HP): The graph below shows the settlement price for Brent against hedging pressure. Hedging pressure 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. The fact that HP continued to increase early this year showed that, despite rising prices, there was not as much optimism among the major players, based on fundamentals. However, by looking at the last two weeks of March, we see HP easing slightly as prices stabilized and return to their normal inverse relationship to prices.

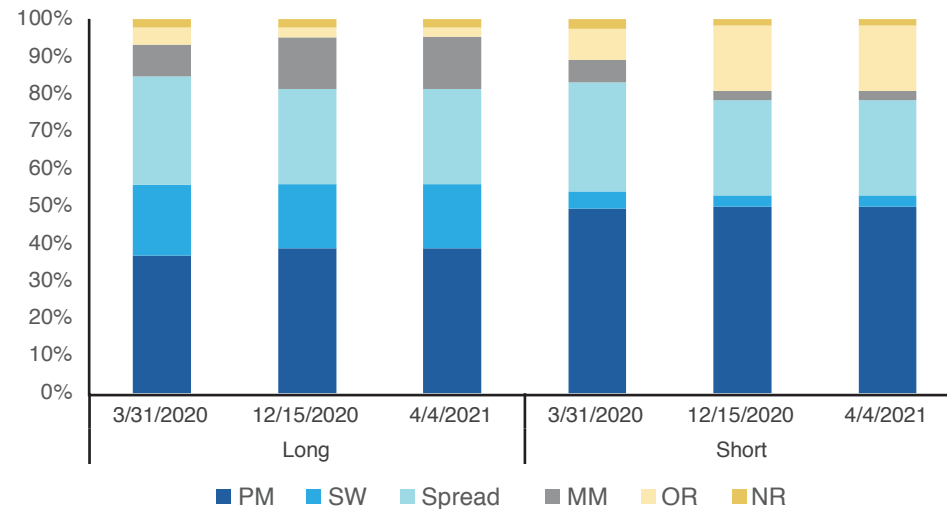
Trader class shares: The most significant and noticeable aspects of the past two quarters, compared with the same time last year, are the long positions taken by money managers (MM), which in turn supported the short positions of other reporters (OR). This can be seen in two ways: MM are optimistic about prices rising gradually, or OR have stocks that can be sold profitably now.

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



Source: Bloomberg, April 5, 2021.

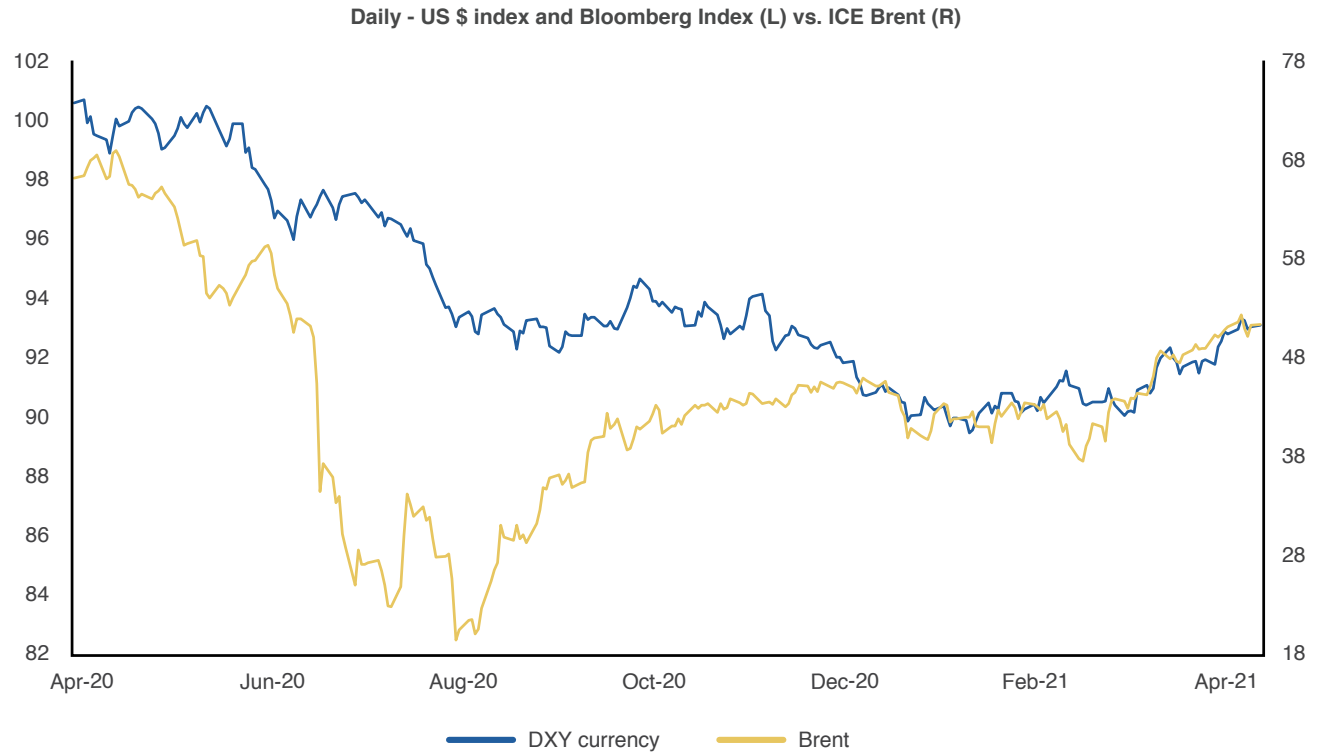
Traders class shares of longs and shorts



Source: Bloomberg, April 5, 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 are now trending upward together. This is partly fueled by an improved economic outlook for the U.S. alongside reliable oil market management by OPEC and partners.



Source: Bloomberg, April 5, 2021.

Editorial: An uneven recovery

The strain of lockdown and working from home for a year has gotten to everyone, and it seems like the oil market is not immune to the same mood swings. Bullish and bearish predictions in the last quarter stretched to the edges of our confidence interval, with calls for anything from \$100/b by year-end to concerns over new lockdowns and increased supply pulling prices down. Usually, forecasts tend toward a central case where the past dictates the future and acts as an anchor. However, the last quarter has been so eventful (the Suez blockage, the Trump-to-Biden transition and new policies from the Biden administration, the Texas freeze, EU lockdowns, etc.) that it is difficult to trust 'business-as-usual,' and our expectations have been set adrift.

When the market is driven by demand (see our editorial from last year [KOMO Q4 2020], a wide range of predictions are entirely reasonable because demand indicators seem to give conflicting messages. Chinese domestic air travel has returned significantly, and the United Kingdom has banned foreign holidays. Australia is holding maskless concerts, while Brazil is digging mass graves. The U.S. almost has a vaccine surplus, while EU manufacturing is facing constant problems. This is what an uneven recovery looks like.

The circumstances of countries and individuals have a huge impact on potential demand, with the wealth of countries and the compliance of their citizens with the COVID-19 regulations the major determinants. Some countries are performing better than others, but it is important to remember that this is a global problem, not a local one. Most participants need to recover before the market's fundamentals can return to normal. Many are eagerly anticipating a 'roaring 20's' similar to the aftermath of the 1918 pandemic, with a boom in consumption. However, for now this is wishful thinking, with the vaccination rate still below 10% worldwide.



Appendix

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

			2020	Q1	Q2	Q3	Q4	2021	Q1	Q2	Q3	Q4	2022	Q1
Americas	OECD	United States	18.3	18.4	19.2	20.0	20.3	19.5	20.2	20.3	20.7	20.7	20.5	20.6
		Canada	2.5	2.5	2.3	2.4	2.4	2.4	2.6	2.5	2.6	2.6	2.6	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
		Chile	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
		Total	22.8	23.0	23.7	24.7	24.9	24.1	25.0	25.1	25.6	25.7	25.4	25.5
	Non-OECD	Argentina	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.6
		Brazil	2.9	2.8	2.9	3.1	3.1	3.0	3.0	3.0	3.1	3.0	3.0	3.0
		Venezuela	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
		RO Latin America	2.2	2.2	2.4	2.5	2.5	2.4	2.4	2.5	2.6	2.5	2.5	2.5
		Total	6.0	6.0	6.3	6.5	6.5	6.3	6.4	6.5	6.7	6.6	6.5	6.5
Total Americas			28.8	29.0	30.0	31.2	31.5	30.4	31.4	31.7	32.2	32.3	31.9	32.0
Europe	OECD	Germany	2.2	2.1	2.2	2.4	2.4	2.3	2.3	2.4	2.5	2.4	2.4	2.3
		France	1.5	1.6	1.6	1.7	1.7	1.6	1.7	1.7	1.7	1.7	1.7	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
		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
		Turkey	0.9	0.7	0.9	1.0	1.0	0.9	0.9	1.0	1.1	1.0	1.0	0.9
		RO OECD Europe	6.5	6.7	6.6	6.8	6.7	6.7	6.7	6.7	6.7	7.0	6.8	6.9
	Total OECD Europe	13.1	13.0	13.3	14.1	14.1	13.6	13.8	14.0	14.3	14.3	14.1	14.1	
Asia-Oceania	OECD	Australia	1.0	1.1	1.1	1.1	1.2	1.1	1.2	1.2	1.2	1.2	1.2	1.2
		Japan	3.4	3.4	3.6	3.7	3.6	3.6	3.8	3.2	3.3	3.6	3.5	3.8
		Republic of Korea	2.4	2.6	2.4	2.4	2.5	2.5	2.5	2.4	2.5	2.7	2.5	2.7
		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
		Total	7.0	7.2	7.2	7.4	7.5	7.3	7.7	6.9	7.1	7.7	7.3	7.9
	Non-OECD	China	13.5	14.9	14.6	14.0	13.6	14.3	14.0	14.5	14.5	15.0	14.5	14.8
		India	4.6	5.0	5.0	4.7	5.0	4.9	5.2	5.3	5.0	5.3	5.2	5.6
		Indonesia	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.8	1.8	1.7	1.7	1.8
		RO Asia	6.4	7.3	7.1	7.1	7.0	7.1	7.2	7.2	7.7	7.7	7.4	7.8
		Total	26.1	28.9	28.4	27.5	27.4	28.1	28.2	28.8	28.9	29.7	28.9	30.0
Total Asia			33.1	36.1	35.7	34.9	34.9	35.4	35.8	35.6	36.0	37.4	36.2	37.9
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
	Non-OECD	Bahrain	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1
		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
		Kuwait	0.4	0.3	0.4	0.5	0.4	0.4	0.3	0.4	0.5	0.3	0.4	0.3
		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
		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
		Qatar	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1
		UAE	0.8	0.8	0.9	0.8	0.9	0.8	0.7	0.8	0.8	0.8	0.8	0.8
		Total GCC	5.2	4.7	5.5	6.0	5.2	5.4	4.8	5.5	6.1	5.1	5.4	4.7
		Iran	1.8	1.7	1.7	1.6	1.6	1.6	1.7	1.7	1.7	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
	Total	7.4	6.7	7.6	8.0	7.3	7.4	6.9	7.6	8.2	7.1	7.4	6.8	
	Total Middle East			7.7	6.9	7.8	8.3	7.5	7.6	7.1	7.8	8.4	7.4	7.7
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	
		South Africa	0.5	0.5	0.5	0.6	0.6	0.5	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	
	Total Africa			3.6	3.6	3.6	3.5	3.7	3.6	3.8	3.6	3.8	3.8	4.0
Eurasia	Non-OECD	Russia	3.5	3.5	3.5	3.8	3.7	3.7	3.6	3.6	3.9	3.8	3.7	3.7
		RO Eurasia	2.1	1.8	1.9	2.1	2.0	2.0	1.8	2.0	2.2	2.1	2.0	1.9
	Total Eurasia			5.7	5.3	5.4	5.9	5.8	5.6	5.4	5.6	6.1	5.9	5.7
Global Demand			92.0	93.9	95.8	98.0	97.4	96.3	97.5	98.5	100.6	101.2	99.4	100.6

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

	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023
Africa	7.66	6.91	6.57	7.27	7.46	7.69	7.84	7.91	7.90
Americas	34.85	31.18	32.29	32.31	32.16	32.51	32.78	33.35	33.74
Asia	9.45	9.17	9.24	9.20	9.26	9.25	9.24	9.26	9.27
Eurasia	14.77	13.19	12.74	13.15	13.38	13.51	13.68	14.00	14.32
Europe	4.40	4.32	4.14	4.27	4.43	4.43	4.44	4.45	4.46
Middle East	29.59	27.65	25.95	26.49	26.63	26.97	28.06	28.15	27.73
Total	100.72	92.42	90.93	92.69	93.33	94.36	96.06	97.13	97.43
	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023
Conventional	73.34	67.98	65.95	67.26	67.80	68.55	69.97	70.57	70.47
Extra heavy oil	3.67	3.24	3.16	3.24	3.35	3.37	3.38	3.39	3.37
Oil sands	2.84	2.48	2.52	2.93	3.04	3.05	3.08	3.10	3.11
Oil shale (kerogen)	0.03	0.03	0.04	0.03	0.03	0.04	0.04	0.04	0.04
Other liquids	6.34	6.49	6.60	6.45	6.51	6.70	6.85	6.99	7.08
Tight oil	11.92	10.02	10.42	10.48	10.37	10.40	10.48	10.73	10.97
Unconventional gas	2.56	2.16	2.24	2.30	2.22	2.23	2.26	2.32	2.38
Total	100.72	92.42	90.93	92.69	93.33	94.36	96.06	97.13	97.43
	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023
Algeria	1.02	0.90	0.84	0.86	0.87	0.89	0.91	0.91	0.91
Angola	1.36	1.26	1.17	1.12	1.10	1.17	1.20	1.21	1.20
Congo	0.29	0.29	0.28	0.26	0.27	0.26	0.25	0.25	0.24
Equatorial Guinea	0.13	0.12	0.11	0.11	0.11	0.10	0.10	0.09	0.09
Gabon	0.19	0.18	0.15	0.17	0.16	0.16	0.16	0.15	0.15
Iran	2.02	1.97	1.90	1.95	2.16	2.13	2.17	2.24	2.31
Iraq	4.56	4.16	3.70	3.84	3.94	3.99	4.09	4.10	4.11
Kuwait	2.77	2.48	2.25	2.30	2.34	2.37	2.41	2.41	2.41
Libya	0.35	0.08	0.11	0.92	1.18	1.22	1.27	1.28	1.24
Nigeria	1.72	1.55	1.44	1.44	1.32	1.39	1.43	1.48	1.52
Saudi Arabia	9.66	9.15	8.64	8.88	8.40	8.58	9.42	9.42	8.92
UAE	3.30	2.88	2.55	2.50	2.62	2.68	2.71	2.71	2.71
Venezuela	0.77	0.50	0.35	0.40	0.52	0.51	0.52	0.52	0.52
Oil field production	28.14	25.52	23.49	24.75	24.99	25.45	26.63	26.77	26.34
Other production	5.20	4.94	4.84	4.94	5.05	5.12	5.15	5.16	5.15
OPEC	33.34	30.46	28.33	29.69	30.04	30.56	31.79	31.93	31.48
	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023
Call on OPEC	45.79	47.36	49.19	48.02	47.68	48.45	50.61	51.22	50.56
OPEC	30.04	30.56	31.79	31.93	31.48	31.98	32.46	33.11	33.52
OPEC Partner	15.15	15.32	15.51	15.83	16.14	16.33	16.49	16.62	16.65
Non-OPEC	48.14	48.48	48.76	49.38	49.80	50.06	50.03	49.94	50.04
Total	93.33	94.36	96.06	97.13	97.43	98.37	98.98	99.67	100.21

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

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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.

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